

MID TERM EVALUATION

of the UNDP/GEF Project

**“Promoting of Appliance of Energy Efficiency and Transformation
of the Refrigerating Appliances Market in Ghana”**

(Project ID 74729, Atlas Award ID 59667, PIMS 4003)

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June 2013

This Mid-Term Evaluation of the UNDP-GEF project 'Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana' was carried out between May 6 and June 30, 2013.

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Acknowledgements

The evaluator would like to express his gratitude and appreciation for the excellent support provided by the Project Coordinator, Mr. Eric Antwi-Agyei, and by the staff of Energy Commission. He would also like to thank all stakeholders who agreed to give interviews during the course of this mandate - the information and opinions shared have been crucial to the preparation of this evaluation. Finally, he would like to thank the staff at the UNDP Country Office in Ghana, and in particular, Mr. Paolo Dalla Stella for his support.

ABBREVIATIONS AND ACRONYMS

A/C	air conditioning
APR	Annual Project Report
AWP	Annual Work Plan
CAG	Consumers Association of Ghana
CDM	Clean Development Mechanism
CEPS	Customs, Excise and Preventive Service
CO	Country Office
CO ₂	carbon dioxide
CPA	Consumer Protection Agency
CSIR-IIR	Council for Scientific and Industrial Research – Institute of Industrial Research
CWMC	City Waste Management Company
EC	Energy Commission
ECOWAS	Economic Community Of West African States
ECREEE	ECOWAS Centre for Renewable Energy and Energy Efficiency
EE	energy efficiency
EPA	Environmental Protection Agency
EU	European Union
FSP	Full Size Project
GEF	Global Environment Facility
GhEF	Ghana Energy Foundation (GhEF)
GHG	greenhouse gas
GRA-CEPS	Ghana Revenue Authority - Customs, Excise and Preventive Services
GSB	Ghana Standards Board
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Organization for technical Cooperation)
M&E	Monitoring and Evaluation
MLF	Multilateral Fund
MESTI	Ministry of Environment, Science and Technology and Innovation
MOE	Ministry of Energy
MOTI	Ministry of Trade and Industry
MTE	Mid-Term Evaluation
NARWOA	National Air-Conditioning and Refrigeration Workshops Owners Association
NGO	Non-Government Organization
ODS	Ozone Depleting Substance
PM	Project Manager
PIR	Project Implementation Review
RAAG	Refrigeration and Air Conditioner Engineers Association of Ghana
RTA	Regional Technical Advisor
SME	Small and Medium Enterprise
TA	Technical Advisor
ToR	Terms-of-Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollars
WEEE Directive	Waste Electrical and Electronic Equipment Directive (2002/96/EC)

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1. Executive summary

Brief description of the project

The UNDP/GEF Full-sized Project “Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana” started in July 2011 and is expected to close in June 2014. The project is funded by the GEF (USD 1.7 million) with co-financing from Government of Ghana (USD 3.0 million), UNDP (USD 0.2 million) and MLF (USD 2.0 million) The project falls under the GEF Focal Area Climate Change (CC).

The primary objective of the project is to improve the energy efficiency of appliances marketed and used in Ghana through the introduction of a combination of regulatory tools such as Minimum Energy Performance Standards and Information Labels (S&L), and innovative economic tools. The project aims at strengthening the regulatory and institutional framework, developing monitoring and enforcement mechanisms, and providing training to appliance professionals. The project is exploring and testing efficient market-based economic incentives complemented by repeated public outreach campaigns. Domestic refrigeration appliances are the first end-use devices to be tackled, with a specific focus to address ozone depleting substances contained in the current stock of equipment.

The project Executing Entity/Implementing Partner is the Energy Commission. The Implementing Entity/Responsible Partners are the Ministry of Energy and the Environmental Protection Agency

Context and purpose of the evaluation

This Mid-Term Evaluation has been conducted on behalf of the UNDP in accordance with the UNDP/GEF Monitoring and Evaluation Policy and with particular attention to whether GEF requirements are being met. In line with the requirement of the project document, the project must be subjected to at least two independent external evaluations, namely the Mid-Term and the Terminal Evaluations.

Main conclusions

The evaluator concludes that the project is progressing positively although somewhat slower than planned and that the project's performance – both with regard to managerial and financial aspects as well as with regard to achieving results – is **moderately satisfactory**. The project's impact in Ghana is evident but there is a gap in monitoring that impact in relation to project GHG emission reduction targets.

Relevance

The project has initiating a tangible momentum for energy efficiency in Ghana. The project is strategically sound and has the solid backing of government and government agencies. The project is supporting and promoting locally and regionally relevant energy conservation measures on a broad basis through a broad variety of activities and has attracted the enthusiasm and interest of diverse stakeholders and other regional governments.

Management

The Energy Commission has good relationships with various ministries and stakeholder groups. The project team is able to effectively coordinate with other ministries and agencies.

A Steering Committee consisting of a large number of stakeholders has been established and there is good coordination and communication. Stakeholders generally feel that their advice and recommendations are being considered in the project implementation

Some weakness is evident in the monitoring of progress towards meeting project targets and GHG objectives and in the application of adaptive management to ensure that project objectives are achieved.

Performance

The project is progressing well towards completing project activities and outcomes on a broad basis. However, several key targets including appliance exchange and CO₂ emission reduction targets need to be addressed promptly by the management team.

The increased awareness, capacities and mechanisms initiated by the project are showing sustainable results.

Financial

Spending is currently below that planned in the Project Document.

Project Rating

Project Formulation	
Conceptualization/Design	Satisfactory
Stakeholder Participation	Satisfactory
Project Implementation	
Implementation approach	Moderately Satisfactory
Monitoring and evaluation	Moderately Satisfactory
Stakeholder participation	Satisfactory
Results	
Attainment of objectives	Moderately Satisfactory
Comparative Advantage	Satisfactory
Overall Rating	Satisfactory

Recommendations

1. CO₂ Emission Reduction Targets. Considering the variety of activities and results realized to date, it is recommended that detailed appliance sales surveys be carried out to better assess the impact of the project on the EE appliance market in Ghana.
2. Appliance Purchase Program. A variety of financing models need to be developed and marketed to attract a broad range of consumers to purchase energy efficient refrigerators instead of used refrigerators.
3. National Scale Exchange Program. The refrigerating appliance turn-in and rebate program should include more brands, more dealers and a broad regional base before project end.
4. Refrigerator Testing, Certification and Labeling. It is recommended that manufacturers have appliances certified at recognized international testing facilities before import. The Ministry of Industry and Trade should distribute a list of 8 to 10 international accredited test facilities where appliances can be certified.
5. Publicity Campaigns. Financing of the campaigns requires considerable budget and it is recommended that the project seek in-kind support from sponsors (for example, radio and t.v. broadcasters, utilities, appliance manufacturers, wholesalers and dealers)

6. Project Extension. In order to implement the remaining outputs and to properly consider and implement the recommendations above, it is recommended that the project plan for an extension of 6 to 12 months.
7. Target EE Labels for All Appliances.
8. Regional Collaborations Explore opportunities for regional collaboration.
9. EE interventions in other sectors. The Energy Commission should be actively involved in promoting and initiating legislative reforms to improve the energy efficiency in building, industry, transport and tourism.

Lessons learned

1. Such projects benefit enormously from the political will from the government side. The project is technically sound with a good range of activities in the areas of legislation, awareness raising and demonstration all of which have received support. Government and stakeholder involvement during preparation and implementation is positive and the government has given the project national priority.
2. Capable leadership is essential for keeping projects moving and meeting objectives. As a national focal point for energy projects, the Energy Commission has shown capacity, influence and flexibility in developing implementing the project. Further, the project builds on and benefits from the experiences of previous projects carried out by the Energy Commission
3. Sound knowledge and understanding of the local situation is essential for project design and implementation.
4. The evaluator considers a major point for the success of the project was the fact that it attempted to address the strong need for energy efficiency in Ghana through the promotion and support of an effective and financially sustainable measure. The project works intensively with EE refrigerating appliances at many levels, from quality assurance through standards and testing on one end and the development and implementation of broad distribution and turn-in programs on the other.
5. The co-operation between UNDP and the Energy Commission can be qualified as good. It constitutes one of the major aspects leading the success of the project.
6. The used appliance and ODS collection and disposal facility is a good practice example of sustainable collaboration. It is self-financed by the collection and sale of recycled material and a share of the revenues from the ODS recovery and destruction.
7. The expected individual and combined impacts of the mix of measures in the project should be reflected in the direct and indirect GHG emission reduction targets and project monitoring.

2. Introduction

Purpose of the evaluation

The mandate of this report is the Mid-Term Evaluation of the UNDP/GEF Full-sized Project “Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana” which started in July 2011 and is planned to close in June 2014.

This Mid-Term Evaluation has been conducted on behalf of UNDP in accordance with the UNDP and GEF Monitoring and Evaluation Policy, applying the criteria set out in the Terms of Reference (see Annex 1). In particular the evaluation is to determine progress being made towards the achievement of outcomes and to identify course correction if needed. In line with the requirement outlined in the project document, the project is to be subjected to at least two independent external evaluations, namely the Mid-Term and the Terminal Evaluations.

This Mid-Term Evaluation intends to assess the implementation and performance of the project. It has the following objectives:

1. Determine progress being made towards the achievement of outcomes;
2. Focus on the effectiveness, efficiency and timeliness of project implementation;
3. Highlight issues requiring decisions and actions;
4. Present lessons learnt and best practices about project design, implementation and management, and state how they can be applied to future and other on-going projects;
5. Examine the performance of the project since the beginning of its implementation as measured against planned outputs set forth in the Project Document in accordance with rational budget allocation and the assessment of features related to the process involved in achieving those outputs, as well as the initial and potential impacts of the project;
6. Address underlying causes and issues contributing to targets not adequately achieved;
7. Identify weaknesses and strengths of the project design;
8. Recommend any necessary changes in the overall design and orientation of the project by evaluating the adequacy, efficiency, and effectiveness of its implementation, as well as assessing the project outputs and outcomes to date;
9. Assess if there is evidence that sustainability of benefits is being built into the project (institutional and financial capacity).

This Mid-Term Evaluation is based on five major criteria as outlined in the GEF Monitoring and Evaluation Policy:

1. Relevance – the extent to which the activity is suited to development priorities and organizational policies, including changes over time.
2. Effectiveness – the extent to which an objective has been achieved or how likely it is to be achieved.
3. Efficiency – the extent to which results have been delivered with the least costly resources possible.
4. Results – the positive and negative, and foreseen and unforeseen, changes to and effects produced by a development intervention. In GEF terms, results include direct project outputs, short- to medium-term outcomes, and long-term impact including global environmental benefits, replication effects and other, local effects.
5. Sustainability – the likely ability of an intervention to continue to deliver benefits for an extended period of time after completion. Projects need to be environmentally as well as financially and socially sustainable.

Key issues addressed

This Mid-Term Evaluation focuses on the following aspects:

- Project design and its relevance in relation to:
 - a) Development priorities at the national level.
 - b) Stakeholders – assess if the specific needs were met.
 - c) Country ownership/drivenness – participation and commitments of government, local authorities, public services, utilities, residents.
 - d) UNDP mission to promote sustainable human development (SHD) by assisting the country to build its capacities in the focal area of environmental protection and management.
- Performance – look at the progress that has been made by the project relative to the achievement of its objective and outcomes:
 - a) Effectiveness – extent to which the project has achieved its objectives and the desired outcomes, and the overall contribution of the project to national strategic objectives.
 - b) Efficiency – assess efficiency against overall impact of the project for better projection of achievements and benefits resulting from project resources, including an assessment of the different implementation modalities and the cost effectiveness of the use of GEF resources and actual co-financing for the achievement of project results.
 - c) Timeliness of results.
- Management arrangements focused on project implementation:
 - a) General implementation and management – evaluate the adequacy of the project, implementation structure, including the effectiveness of the National Steering Committee and Consultative Forum, partnership strategy and stakeholder involvement from the aspect of compliance to UNDP/GEF requirements and also from the perspective of “good practice model” that could be used for replication.
 - b) Financial accountability – extent to which the sound financial management has been an integral part of achieving project results, with particular reference to adequate reporting, identification of problems and adjustment of activities, budgets and inputs.
 - c) Monitoring and evaluation on project level – assess the adoption of the monitoring and evaluation system during the project implementation, and its internalization by competent authorities and service providers after the completion of the project; focusing on the application of SMART performance indicators.
- Overall success of the project with regard to the following criteria:
 - a) Impact – assessment of the results with reference to the development objectives of the project and the achievement of global environmental goals, positive or negative, intended or unintended changes brought about by the project intervention, (number of households benefiting, number of areas with the new technology in place, level of sensitization and awareness about the technology; any change at the policy level that contributes to sustainability of the tested model, impact in private/public and/or at individual levels);
 - b) Global environmental benefits – reductions in greenhouse gas emissions.
 - c) Sustainability – assessment of the prospects for benefits/activities continuing after the end of the project, static sustainability which refers to the continuous flow of the same benefits to the same target groups; dynamic sustainability use and/or adaptation of the projects' results by original target groups and/or other target groups.
 - d) Contribution to capacity development – extent to which the project has empowered target groups and has made possible for the government and local institutions (municipalities) to use the positive experiences; ownership of projects' results.
 - e) Replication – analysis of replication potential of the project positive results in country and in the region, outlining of possible funding sources; replication to date without direct intervention of the project;
 - f) Synergies with other similar projects, funded by the government or other donors.

Issues of special consideration:

This Mid-Term Evaluation reviews and assesses the methodology for calculating CO₂ emission reductions including direct and indirect CO₂ emission reductions resulting from the project.

Considering future development support in the region, this Mid-Term Evaluation assesses the support model applied in the project, its implications for the long-term impact and the sustainability of the project results. This Mid-Term Evaluation Report also presents recommendations and lessons learnt for broader applicability and future support of the UNDP and/or Governments, highlighting best practice.

Methodology of the Evaluation

This Mid-Term Evaluation was implemented according to the following procedure:

1) Preliminary documentation review:

The initial stage involved the review of project documentation and associated documents (Annex 5). The documentation was provided by the UNDP Country Office in Ghana, the Project Coordinator, the Energy Commission and downloaded from the internet.

2) Preparations for mission:

Through discussions with the Project Coordinator, Mr. Eric Antwi-Agyei, and the UNDP project focal point, Mr. Paolo Dalla Stella at the UNDP CO, an itinerary for the local mission was proposed and developed (Annex 2). The interviewees were selected so as to provide a broad sample of the different stakeholders involved in the project including UNDP, governmental representatives, staff at the Energy Commission, Retailers and implementation partners. A general interview format (Annex 6) was submitted prior to the mission.

3) Mission:

The local mission to Accra took place from May 27 to May 31, 2013. The itinerary (Annex 2) consisted of meetings and interviews with project management and key stakeholders as well as visits to participating stores and demonstration facilities. The Project Coordinator, Mr. Eric Antwi-Agyei, kindly assisted the evaluator by arranging interviews.

(a) Presentation and explanations by the project management team:

The UNDP and project team made a thorough presentation of the project concept, the project outcomes and the key project results.

(b) Stakeholder interviews:

Annex 3 contains a list of interviews completed.

(c) Field visits to participating stores and disposal facilities.

(d) Collection of additional documentation:

Data and documents were made available by project management and stakeholders during the mission.

4) Telephone interviews with the UNDP Regional Center in Dakar:

On Wednesday, June 5, 2013, a follow-up telephone interview was conducted with Mr. Benoit Lebot, the Environment & Energy Group Practice Leader at the UNDP Regional Center in Dakar and Regional Technical Advisor for the project.

5) Data analysis:

Following the mission, the collected data and opinions were compiled and analyzed. Various information and data were assessed and compiled to ensure an objective project evaluation according to GEF/UNDP Monitoring and Evaluation Policy.

6) Reporting:

This Mid-Term Evaluation is based the interviews with the relevant stakeholders as well as the review of available documentation. This report includes relevant comments and suggestions raised by UNDP, the Energy Commission and other national stakeholders interviewed as well as the findings and opinions of the author.

Structure of the evaluation

The structure applied in this evaluation is based on a performance assessment approach guided by the principles of Results-based Management. The evaluation tracks impact based on the Logical Framework Approach. The contribution of project outputs and project management is evaluated with reference to the achievement of the project outcomes and overall objective. This Mid-Term Evaluation reviews the implementation and achievements of the project in question against the Project Document endorsed by GEF, including any adjustments made during implementation.

3. The project and its development context

Project Summary (as in PIMS and Project Document)

The primary objective of the project is to improve the energy efficiency of appliances marketed and used in Ghana through the introduction of a combination of regulatory tools such as Minimum Energy Performance Standards and Information Labels (S&L), and innovative economic tools. The project aims at strengthening the regulatory and institutional framework, developing monitoring and enforcement mechanisms, and providing training to appliance professionals. The project is exploring and testing efficient market-based economic incentives complemented by repeated public outreach campaigns. Domestic refrigeration appliances are the first end-use devices to be tackled, with a specific focus to address ozone depleting substances contained in the current stock of equipment.

The project falls under the umbrella program 'GEF Energy programme for West Africa.' The project is funded by the GEF (USD 1.7 million) with co-financing from Government (USD 3.0 million), UNDP (USD 0.2 million) and MLF (USD 2.0 million).

Project start and duration

The Project Document 'Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana' included a 3-year project duration period. The project started on July 1, 2011 and is expected to finish June 30, 2014.

Problems that the project seeks to address

Refrigerating appliances (typically imported used appliances) consume an average of 1,140 kWh/year in Ghana, or approximately three times more energy than the maximum allowed in countries with robust standards and labeling programs. Such inefficient appliances result in US\$50 to US\$100 per year of potentially unnecessary electricity expenses for a typical owner which he/she can ill-afford. The wasteful consumption of electricity results in more than 0.7 tons per year of CO₂ emissions per appliance, and uncontrolled release of ozone depletion substances (ODS) from used appliances can result in the equivalent of another 2 tons of CO₂ every time an inefficient, used

appliance is improperly disposed or replaced. With about 2 million inefficient refrigeration appliances in use throughout Ghana, the economic cost of such inefficiency is many hundreds of millions of dollars to the national economy, while the avoidable greenhouse gas emissions is many millions of tons of CO₂ over the long term. Such economic and environmental damage needs to be mitigated by replacing inefficient, used refrigeration appliances in Ghana with more efficient and environmentally friendly versions of the same appliance.

Many barriers, however, prevent the implementation of labeling, minimum energy performance standards, and consumer education and incentive programs and the penetration of higher efficiency appliances in Ghana and they include the following:

- Lack of knowledge in the ministries and institutions in charge of enforcing labeling regulations on how to specifically proceed to implement and enforce regulations and how to develop support programs for Standards and Labels (S&L) in order to speed up the market transformation process;
- Little information is available at the government level on the potential impact and cost effectiveness of S&L programs;
- Customers lack information about the availability of energy efficient equipments and the cost effectiveness of investing in efficient appliances;
- Inefficient pricing of energy services has resulted in unrealistic electricity tariffs that do not encourage energy conservation and adoption of energy efficient appliances;
- Many consumers lack access to credit or capital, so that even a relatively small increase in first cost can be a severe barrier to purchasing a more efficient appliance; thus the need for a rebate program;
- Lack of sustainable financing mechanisms and systems for maintaining energy efficiency incentive, rebate and education programs;
- Local retailers are uncertain about the market demand of high efficiency models and lack the capacity to market these appliances. This and the former point lead retailers not to offer a sufficient range of efficient equipment because of the low demand for this type of appliance;
- Lack of national experience and installations for testing household appliances according to international standards;
- Lack of control on import of used refrigerators and freezers;
- Lack of local manufacturing capacity; and
- Availability of cheap used refrigerators on the local market.

In particular the project seeks to address the following Barriers;

Weak Policy, Legal and Regulatory Framework

In Ghana, a policy, legal and regulatory framework for energy efficiency has been developed and adopted. However, the adaptation of this framework into implementable activities requires tremendous efforts. There is a lack of information and know-how about how to proceed efficiently with these important steps. Without support, it is likely that the full implementation will take more time than if the Ghanaian Government can benefit from the experience gathered in other countries. The present project addresses this barrier with a comprehensive component on the strengthening and implementation of the policy, legal and regulatory system. GEF involvement will provide the necessary resources for capacity building and this will be main catalyst to increase the efficiency of the in-kind effort that will be provided by the government and stakeholders.

Limited Institutional capability

In Ghana, the coordination between the various government ministries responsible for standard and labeling development, then implementation and enforcement is difficult. There is no experience on how a structured enforcement program should be implemented, and there is no laboratory that could perform energy efficiency testing on household appliances. Often, the laboratory equipment does

not exist and when it exists, the human resources of the laboratory are not trained to perform the required tests according to international standard. In order to have a measurable impact, this project will undertake a multi-sectoral approach to ensure that the energy efficiency measures are incorporated in the sectoral programs of the country. The GEF support is also essential to bring together the human resources needed for capacity building at the local laboratories and to train them and others stakeholders about internationally recognized ISO standards for equipment testing and adequate procedures for enforcement.

Low Public Awareness and Retailers Interest

Some stakeholders' perception is to the effect that the energy labeling system is not yet mature for the economic environment of Ghana and in general is better suited for industrialized markets where the purchasing power is higher. Awareness of the opportunities offered by the energy labeling system for household appliances and the associated energy savings is low among the general public and the retailers. This lack of information and awareness implies that both the demand and the supply for energy efficient appliances are minimal. As a consequence, the sales levels are very low for energy efficient appliances. There is therefore a need for dissemination of information on Standards and Labels benefits and opportunities to the general public and retailers in order to raise public awareness and generate activities in the sector. Such a process is the key option to building public confidence and acceptance regarding the energy labeling system. GEF involvement will allow the support of targeted awareness activities aimed at convincing the local retailers and the general population of the benefit of introducing higher efficiency appliances in the market. These efforts from the GEF will be complemented by local NGOs efforts.

Lack of Local Manufacturing Capacity

Currently, there is no local manufacturer of refrigeration appliances in Ghana, and there are no incentives to encourage local entrepreneurs to establish a manufacturing facility for refrigeration appliances that could compete with the current international trend of energy efficient household equipments. Local entrepreneurs are generally unaware that the manufacture of energy efficient refrigeration appliances is possible with minimal investment, and they also do not see the possible market for this category of appliances yet. The GEF funding will be used to bring experienced international experts that can run complex model of appliances and demonstrate the various ways, by which energy gains can be achieved with minimal investment in modern manufacturing technologies. Without GEF support, it is very unlikely that local manufacturing capacity will achieve this leap in technology in the near future.

Lack of Sustainable Financing for Accelerating Efficiency Improvements

Currently there is a lack of effective financing models and mechanisms for providing efficient and sustainable financing for appliance energy efficiency improvement programs. GEF funding will enable both the pilot testing of efficient appliance rebate and turn-in schemes that may eventually be financeable through carbon credits or government loan guarantee schemes or a combination of the two. If project activities can remove these barriers to efficient programs then, the project has the potential to have a positive impact that is many times greater than the programs that are funded directly.

Immediate and development objectives of the project

The project has been designed to erase some of the most significant barriers above and allow a faster transformation process for the market for refrigeration appliances in Ghana. Each outcome has been selected to address one particular category of barriers. The project is to establish an energy labeling system, setting and implementing a Minimum Energy Performance Standards (MEPS) and

pushing efficiency levels beyond the mandatory standard through a consumer rebate, turn-in and incentive program.

The project has eight components:

Component 1 Strengthening of regulatory and institutional framework

This component provides technical assistance and capacity building to the government so it can proceed with S&L implementation. The component also includes support to facilitate access to information on the types of support and enforcement programs that can be introduced in parallel to the legislation. The objective of this component is to create sufficient expertise within the government, so that it can undertake the implementation of the regulations and support programs for refrigeration appliances and equipment.

Component 2 Design of certification, labeling and enforcement systems

This component will provide the government agencies and at least one selected laboratory with support for the design of enforcement procedures and for the testing of appliances. The enforcement procedures will cover the manufacturers, importers and retailers and will ensure that all market actors are informed and are following the new regulation. This also includes the development of a market follow-up tool that will be required to provide the higher level of government with hard facts about the efficiency of the regulation, the evolution of the market and the impact of the programs introduced. Such monitoring will be useful both for the evaluation of impact of this project and to support the future government policy in the S&L domain.

Component 3 Training and public outreach

This component will support the information and awareness activities that are needed to change the perception of the customers about the importance of purchasing higher efficiency appliances and the cost effectiveness of doing so. This will be achieved through the preparation of a marketing plan and the implementation of marketing activities by local and international retailers. The customers, through better information, will react and begin to pay attention to the label and to the category of efficiency of the appliance they purchase.

Component 4 Establishment of refrigerating appliance test facility

This component first provides the design and cost estimates for a refrigeration appliance test facility. Subsequently, the refrigeration appliance test facility will be built and commissioned. Linkages will be sought with ongoing Terminal Phase-out Management Plan (TPMP) and upcoming HCFC Phase-out Management Plan (HPMP) programs funded by the Multilateral Fund (MLF) which also address the refrigeration sector from an ODS (Ozone Depleting Substances) perspective.

Component 5 Used appliance collection and disposal facilities

In this component a number of appliance-disposal facilities will be established in support of programs to replace inefficient used refrigeration appliances. Training and capacity-building activities will be conducted for the Ghana refrigeration appliance industry so that it understands environmentally friendly technologies and procedures for the collection and disposal of appliances and ODSs. The project will then formulate bid documents for used refrigerator collection and disposal services for the pilot programs included in this proposal. After bidding, a contract will be signed for used refrigeration appliance collection and disposal services for the project. The GEF-efforts will be complemented by a demonstration project in ODS-waste disposal centre funded by the MLF which will transport the ODS that is being recovered from the various GEF-funded collection centers to a central location in Accra for reclaiming and destruction. This MLF contribution will be added to the list of co-financing sources to the GEF programme.

Component 6 Efficiency program evaluation and monitoring capacity development

In this component, national professionals will be trained in energy efficiency program monitoring and evaluation study design, methods, technologies and procedures. There will also be a review of monitoring technologies and metering equipment which will be followed by subsequent field testing of the most promising monitoring and metering technologies. This component will conclude with the bid and contracting of the rigorous evaluation and monitoring services needed for impact evaluation of the pilot rebate and turn-in programs described in the next component.

Component 7: Conduct of refrigeration appliance rebate and exchange program

For this component, an appropriate refrigeration appliance rebate and turn- in program will be developed and implemented. The program will establish selection criteria which will include equipment that could have energy consumption improvements through subsidized replacement of the refrigerant. The refrigeration appliance rebate and turn-in program will include subsidies on new efficient refrigerators that will be mainly financed by the Government of Ghana, with equipment support from GEF.

A rigorous program impact evaluation study will be conducted to provide data on the impact of the rebate and turn-in program. The results of the impact evaluation study will be disseminated so that the information becomes well-documented and widely known.

Component 8: Financial design of follow-up national market transformation programs

This component will formulate business plans and finance models for several program follow-up and scale-up scenarios. Amongst the program follow-up financing options, carbon finance potentials for program follow-up will be accurately estimated and publicized. In addition, designs for loan guarantee and capital financing programs that can facilitate follow-up implementation will be formulated and publicized.

At the global level, the project will limit the growth in energy demand from the household sector, and will ensure measurable and sustainable global benefits in slowing the growth rate of GHG emissions resulting from the combustion of carbon based fuels and the consumption of electric power, which in turn will contribute to the mitigation of climate change.

Main stakeholders

The main stakeholders of this project include:

- i. Energy Commission
- ii. Environmental Protection Agency (including its National Ozone Office)
- iii. Institute of Industrial Research, CSIR
- iv. Ghana Energy Foundation
- v. Ghana Standards Board
- vi. Customs, Excise and Preventive Service
- vii. Repair and Maintenance: National Air-Conditioning and Refrigeration Workshops Owners Association (NARWOA), Ghana
- viii. Refrigerator Importers
- ix. Refrigerator Retailers e.g. Somotex Ghana Limited
- x. Consumer Groups
- xi. Financial Institutions (Banks)
- xii. Other Development Partners

Energy Commission

The Energy Commission (the Commission) is the regulating body for the Government of Ghana. There are seven commissioners appointed by the President of the country for various periods ranging from three to five years, and are eligible for re-appointment thereafter. The Commission was established by the Energy Commission Act 541 of 1997 with the authority for the formulation and promulgation of standards and regulations for the energy sector in Ghana. As such, it is the starting point for the formulation of energy efficiency standards in Ghana, and has a current set of commissioners who are extremely supportive of energy efficiency standards and labeling programs.

In addition to formulating regulations, the Commission is responsible for setting policy and procedures with regards to the continuing practicalities of enforcement. For example, under the current air conditioner and CFL efficiency regulation, the Commission is responsible for (1) certifying officers that supervise compliance with the labeling laws; (2) considering petitions challenging product seizures; and (3) disposing of forfeited shipments of non-compliant goods, among others.

The Commission is the Executing Agency of this project and it will implement and manage the project. The Commission will work closely with research institutions such as the Institute of Industrial Research, CSIR and build private-public partnership to ensure sustainable impact of the project.

Environmental Protection Agency

The Environmental Protection Agency (EPA) is the leading public body for protecting and improving the environment in Ghana. It was set up (initially as the Environmental Protection Council) over 30 years ago and it has offices across Ghana working on and carrying out Government policy, inspecting and regulating businesses and reacting when there is an emergency such as a pollution incident. A twelve-member board of directors, appointed by the President of Ghana, supervises its operations, and the management of its day-to-day operations is directly under an Executive Director and seven divisional heads (Directors).

As part of its corporate objectives, EPA seeks to: i) Create awareness to mainstream environment into the development process at the national, regional, district and community levels; ii) Ensure environmentally sound and efficient use of both renewable and non-renewable resources in the process of national development; and iii) Guide development to prevent, reduce, and as far as possible, eliminate pollution and actions that lower the quality of life.

The EPA has an Ozone Office, which has worked closely with Repair and Maintenance: National Air-Conditioning and Refrigeration Workshops Owners Association (NARWOA) for several years in training workshops on the substitution of chlorofluorocarbon (CFC) refrigerants with hydrocarbons in refrigeration systems. It was also instrumental in establishing the legislation and a licensing system for Ozone Depleting Substances.

The EPA proposes to embark on projects on (i) the phasing out of hydrochlorofluorocarbon (HCFC) based appliances; and (ii) the complimentary pilot project for the recovery and disposal of ODS. There are great opportunities for synergy between these projects and this project on the promotion of energy efficient refrigerators.

Institute of Industrial Research, CSIR

The research activities that have been carried out in support of the Ghana refrigerator and refrigerator-freezer efficiency standards were conducted by the Institute of Industrial Research (CSIR-IIR) of the Council of Scientific and Industrial Research (CSIR). The CSIR-IIR is one of the thirteen research institutes under the CSIR that was established as a public sector institution by the

Government of Ghana with the mandate to undertake and co-ordinate research and development activities for the socio-economic development of Ghana.

The mission of the CSIR-IIR is “to drive national development and global competitiveness in industry through scientific and technological research.” The key research and development programs of the CSIR-IIR are: i) Energy Technologies; ii) Environmental Management; iii) Materials and Manufacturing; and iv) Information Management. The CSIR-IIR coordinated and implemented the field research and data collection related to refrigerator and refrigerator-freezer energy efficiency standards in Ghana under its Energy Technologies Program.

Ghana Energy Foundation

The Ghana Energy Foundation (GhEF) was established in November 1997 by the Private Enterprise Foundation in collaboration with the Government of Ghana to promote sustainable development and efficient consumption of energy in all of its forms in Ghana.

The GhEF has extensive experience in developing and implementing energy efficiency policies and programs in Ghana. To a large extent, the implementation of mandatory energy efficiency standards with regards to air conditioners, is the result of a multi-year initiative by GhEF to promote energy efficiency and to push legislation through the Ghanaian Parliament in a bi-partisan manner. The GhEF recently organized a national program to distribute more than 6 million energy efficiency compact fluorescent lights to households as a measure to mitigate shortfalls in electricity supply that hit the country in 2006-2007. The GhEF also organized Ghana's first residential energy use survey (RECS), which thoroughly surveyed appliance use in a statistically representative sample of 3,000 households throughout the country. The GhEF is very actively involved in public education and implementation activities related to the new air conditioner standard. The GhEF also coordinated closely with the CSIR-IIR on the research conducted in support of the current refrigerator and refrigerator-freezer standard.

Customs, Excise and Preventive Service

Together with the Ghana Standards Board, the Customs, Excise and Preventive Service (CEPS) will be responsible for the enforcement of energy efficiency standards in Ghana. The CEPS is headed by the Commissioner who is appointed by the President on the advice of the Council of State. The Commissioner is supported by Deputy Commissioners in charge of i) Finance Administration and Human Resource; ii) Operations; iii) Preventive Service; and iv) Research/Monitoring and Planning.

Ghana Standards Board

The Ghana Standards Board (GSB) is the national standards body, and it supports the National Quality Infrastructure. The mission of the GSB is to contribute towards the strengthening of the economy of Ghana and towards the enhancement of the quality of life for all her people through the promotion of standardization. The GSB was established in 1967, and its key services include: i) national standards development and dissemination; ii) testing; iii) inspection; iv) product certification; and v) destination inspection of imported high-risk goods. The GSB has already established the minimum energy performance standard for refrigeration appliances in Ghana and this project is intended, among others, to strengthen the structures to facilitate the implementation of the standard. The GSB will work with the Customs, Excise and Preventive Service to ensure that quality standards are maintained for appliances coming into the Ghanaian market.

Repair and Maintenance: National Air-Conditioning and Refrigeration Workshops Owners Association (NARWOA)

The National Air-Conditioning and Refrigeration Workshops Owners Association (NARWOA) is a nationwide Trade Association of over 5,000 owners of repairer workshops of air conditioners and refrigerators in Ghana. It was established in 1988, with its headquarters in Accra. The Association has a good track record as being well-organized and being interested in undergoing training for greater efficiency and to explore new market opportunities in their business. The Ozone Office of Ghana's Environmental Protection Agency has worked closely with this Association for several years in training workshops on the substitution of CFC refrigerants with hydrocarbons in refrigeration systems.

Refrigerator Retailers

The potential refrigerator retailers include: i) Somotex Ghana Limited, Ghana; and ii) Bosch Siemens Home Appliances Group, Germany. Somotex Ghana Limited has more than 10 years experience in Ghana's electronics and appliances industry and it has 12 showrooms across the country as well as a full-fledged service and logistics facility. It has been a leading household name in the country known for quality products and service. The firm seeks to expand its portfolio of electronics appliances and plans to establish many more showrooms in the country in the years to come.

Bosch Siemens Home Appliances (BSH) Group is a corporate group operating worldwide, and together with a global network of sales and customer service firms, the BSH family is today made up of about 60 companies in almost 40 countries. Within a comprehensive brand portfolio, the main brands are Bosch and Siemens. The product range encompasses large and small home appliances, floor-care and hot water appliances. BSH is the largest manufacturer of home appliances in Germany and Europe, and one of the leading companies in the sector worldwide.

Other Development Partners

The German sustainable development assistance agency, GTZ, has also expressed interest in participating and supporting this project. The Bosch and Siemens Home Appliance Group has a track record of successful public-private cooperation with GTZ in activities including: i) Development of the approved CDM methodology AMS III.X., which credits both energy savings from refrigerator replacement programs; ii) Preparation of a CDM Program of Activities for demand-side management programs of Brazilian utilities to distribute high-efficiency refrigerators to poor households, as well as retail models; and iii) Advising the Voluntary Carbon Standard on its guidelines for VER methodologies to credit Montreal Protocol gases.

Results expected

The largest benefit in terms of potential economic value to the Ghanaian economy and people is the economic savings from more efficient energy use. This impact should be approximately several hundred dollars of net benefit over the long term for those households that switch from a less efficient to a more efficient refrigeration appliance. This economic benefit also contributes to Ghana's achievement of its Millennium Development Goals when poor households who now spend a large and growing fraction of their income on electricity bills can reduce unnecessary expenses caused by inefficient appliances.

In addition to this large economic benefit, the largest environmental benefits are the reduction in CO₂ and ODS emissions. The decreased emissions come from decreased energy use, decreased imports of inefficient refrigerators that use destructive refrigerants, and from increased recovery and disposal of ODS in refrigerants and insulating foams.

There are four types of impacts that the project will have on the availability and use of more efficient and environmentally friendly refrigeration appliances:

1. Adoption of minimum efficiency standards and ODS prohibitions will decrease the imports of inefficient and environmentally damaging appliances;
2. The implemented pilot projects will increase the efficiency and environmental performance of appliances in the households that are targeted in the pilot projects;
3. A national refrigerator replacement and turn-in program that is part of this project will accelerate the elimination of the most inefficient and damaging refrigerators and refrigerants; and
4. A national refrigerator incentive and educational program that follows this project will help increase the efficiency and environmental performance of appliances beyond the levels indicated in the minimum performance standards.

The specific project targets include;

1. The purchase of 50,000 energy efficient refrigeration appliances through the refrigeration appliance rebate and exchange program by year 3 of project implementation resulting in;
 - a. energy savings of 216 000 MWh (8 year appliance lifecycle).
 - b. 129 600 tCO₂ abated through energy savings
 - c. 122 000 kilotons CO₂ abated from CFCs (ODS) removal
2. At least 150 state inspectors trained nationwide on verification and enforcement procedures by Year 3 of project
3. 500,000 households become aware of characteristics of more efficient refrigeration appliances by Year 3
4. Establishment of refrigerating appliance test facility
5. Establishment of used appliance and ODS collection and disposal facilities

4. Findings and Conclusions

4.1. Project formulation

The PIF 'Promoting of Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana' was originally submitted in September 2008, revised, re-submitted and approved in April 2009. The Request for CEO Endorsement/Approval and Project Document 'Promoting of Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana' were submitted in June 2010, then revised and resubmitted in November 2010, in February 2011, and April 7 2011. The CEO endorsement occurred on May 6, 2011.

Conceptualization/Design

The strategy formulated in the Project Document is based on improving the energy efficiency of refrigerating appliances in Ghana through a combination of 4 main interventions;

1. Strengthening regulations on EE appliances
2. Introducing and enforcing appliance standards and labels
3. Building the capacity for appliance testing and certification
4. Raising consumer awareness through media campaigns and a pilot appliance exchange program

The project combines immediate short-term and accessible mechanisms (media campaigns, an appliance exchange program and used appliance disposal facilities) with strategic long-term mechanisms (regulations, standards and labels and certification facilities).

The project concentrates on improving the energy efficiency of refrigerator appliances in Ghana as a first step. Considering the high number of used refrigerator appliances in operation, their high

electricity consumption compared to typical new appliances available on the market and to the poor environmental practices experienced in appliance re-use and disposal, the choice is appropriate. Further, for consumers, energy efficient refrigerating appliances are proven to save costs in the medium and long term. Alone through utility costs savings, these new energy efficient refrigerating appliances can typically recover the investment above the cost of used inefficient appliances after about 5 years.

Assessment of Logical Framework

The project is well outlined in the project document. The development context, key barriers and opportunities to improve demand-side energy efficiency are clearly identified and treated.

Project Outputs and Activities towards achieving these Outcomes are thoroughly elaborated and a 3-year project work plan is included in the Project Document. The strategy is appropriate in that it combines various short-term actions which help establish the reputation and public outreach of the project with long-term measures which support the development of an energy efficient appliance market in Ghana.

The Logical Framework Matrix as formulated in the Project Document is generally appropriate and well structured to act as a tool for results-based management. The hierarchical relationship between objective, outcomes, outputs and targets as described in the body of the project document are generally well formulated in the Logical Framework Matrix.

In addition, the Logical Framework generally includes appropriate targets and timeframes. The total targeted direct GHG emission reductions for the project were indicated as 251.6 thousand tCO₂e comprising:

- 129.6 thousand tCO₂e abated from energy savings
- 122.0 thousand tCO₂e abated from CFCs (ODS) disposal

The calculation is clearly linked to project activities and timelines. In particular, the calculation is based on the replacement of 50,000 used (but functioning) refrigerating appliances with new energy efficient models through the project's refrigerator trade-in program within the 3 years of project implementation.

Lessons from other relevant projects incorporated into project implementation

Domestic refrigerating appliances present a significant potential for energy efficiency improvements and tangible cost savings for consumers. They are a common priority in appliance market transformation strategies.

The project builds on the success of previous projects in Ghana including previous projects implemented by the Energy Commission, addressing the distribution of energy efficient CFL lamps and energy efficient air-conditioning units.

The project activities are broad-based with an appropriate balance between short-term programs with immediate benefits and long-term actions which support the EE market development in the country.

Based on the review of all available information, the project conceptualization and design was rated satisfactory.

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	X					

Country-ownership/Driveness

The project addresses an urgent need in Ghana to reduce the financial burden of fuel imports and government subsidies for energy and to reduce the environmental impact of electricity generation and improper appliance disposal. The project supports further energy efficient and environmental activity in the country.

The energy sector in Ghana faces great challenges on both the supply and demand sides. It is recognized that demand-side management in the form of end-use energy conservation can help moderate the national trends for increasing energy consumption, reduce investments in production facilities and distribution infrastructure and save costs for the consumers.

The UNDP/GEF project is fully consistent with national measures and reflects the high priority put on providing long-term solutions for energy and electricity generation in Ghana. The relevance of the project has increased during project preparation and implementation.

Stakeholder participation

The project has a challenging integration of sectors and involves a good range of stakeholders. The involvement and contributions of diverse stakeholders are evident in the project design and their continued involvement and interests were evident in the interviews with stakeholders. The project design involved partnerships with a number of key players (government, utilities, banks, broadcasters) and the planned activities and programs have a potential for broad impact. Stakeholders interviewed praised the Energy Commission for its motivated, goal-oriented and professional operation.

The stakeholder involvement outlined in the Project Document was generally met and surpassed in the project implementation.

Based on the review of all available information and in the context of project concept and subsequent implementation, the Stakeholder Participation in project design was rated satisfactory.

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	X					

Replication approach

The project employs an appropriate approach to secure replication of project results after project closure, first and foremost through the establishment of regulations, standards and labels. Further, the campaigns being established by the project increase consumer awareness of energy efficiency and form an appropriate springboard for further activities and impacts at the national level. Finally, through training, standards and labels, financial mechanisms and policy measures the project helps to motivate transformation of the EE appliance market in Ghana.

The project is appropriate for adaptation and replication in other countries. The project design and results are of particular interest for neighboring West African countries where markets, socio-economic factors and energy infrastructure are similar to those in Ghana.

Linkages between the project and other interventions within the sector

The project was well placed in the context of both national and international programmes in the field of energy efficiency. Its connection to national schemes was primarily secured by the involvement of the Ministry of Energy.

The project liaises with other GEF projects under development and implementation within the West Africa Strategic Programme. In particular, the project liaises with specific national or regional Energy Efficiency activities under the umbrella of the GEF Programmatic Energy project for West Africa coordinated by UNIDO. The project will contribute as well as benefit from activities currently being developed by ECREEE. This project has linkages to the one on Promoting Energy Efficiency in Residential and Public Sector in Nigeria and another on EE building codes in Senegal. The project will also benefit from the knowledge generated by other UNDP-GEF project on capacity building, codes and investment for access to electricity in Sub-Saharan African rural area.

UNDP Ghana in collaboration with the Environment Protection Agency (EPA), Energy Commission of Ghana and the Center for Scientific and Industrial Research (CSIR) has developed an overarching strategy to provide climate and ozone benefits through the Integrated Plan for Energy Efficiency, Climate Mitigation and ODS Reductions for the Refrigeration Sector. This integrated plan brings about the convergence of 3 synergistic interventions to combine and sequence financing for: (i) the phasing out of HCFC based appliances (MLF); (ii) the promotion of energy efficient refrigerators through Market Transformation (GEF) and (iii) the complimentary pilot project for the recovery and disposal of ODS (MLF). The ultimate objective of this plan is to bring economic, social and environmental benefits to the people in Ghana through the scaling up of energy efficient appliances with low global warming potential (GWP) and zero ozone depleting potential (ODP) for the mainstreaming of ozone and climate benefits into the national development plan.

In 2009, an overarching strategy was formulated as an Integrated Plan for Energy Efficiency, Climate Mitigation and ODS Reduction for the Refrigeration Sector in Ghana with the objectives to combine and sequence environmental finances of this project the following other projects:

- Phasing out of HCFC in the refrigeration servicing sectors with MLF funding of US\$ 1million; and
- Development of an ODS Disposal pilot project with a MLF funding of US\$ 198,000.

Management arrangements

This project on energy efficient refrigeration appliances provides the Government of Ghana with a good opportunity to strengthen the institutional, technical and organization capabilities of its agencies in the area of energy efficiency, especially as it applies to the appliances. The Energy Commission is one of the sector agencies under the Ministry of Energy and acts as Execution Agency. The Energy Commission has been recognized by the Ministry of Energy and the other ministries as the best entity for driving this project forward and for establishing a technical competency centre in the area of energy efficiency refrigeration appliances.

The Energy Commission has been responsible for championing the passing of the Energy Efficiency Standards and Labeling (Refrigerator, Refrigerator-Freezer and Freezer) Regulations, LI 1958, and providing technical expertise to other government departments, and engaging most of the different activities identified for the execution phase. The Energy Commission will rely on contractors and consultants where private sector expertise is more suited to the tasks at hand. The Energy Commission has good working relationships with the relevant Ministries for many years. The Energy Commission's reputation, competence and networks ensure a quick start-up and smooth implementation of the project.

4.2. Project Implementation

Implementation Approach

CEO Endorsement occurred in May 2011 and the project start date was July 1, 2011. The Inception Workshop to launch the three integrated projects (UNDP GEF EE, MLF's HCFC and ODS destruction) occurred in November 2011 with good representation from various stakeholders including the Energy Commission, the Ministry of Energy, the Ministry of Environment, Science and Technology, the Standards Organization, the Environmental Protection Agency, the Refrigeration Engineers Association of Ghana, consumer and research organizations and the media. The first Steering Committee meeting took place in January 2012.

By project outset and prior to GEF funding, several activities has already been completed by the Energy Commission including; all activities under Outcome 1 (Structures and mechanisms for implementation of appliance energy efficiency standards and labels strengthened) except for the activities under Output 1.3 (monitoring and data collection for end-use sales for refrigerator appliances); and all but one of the activities under Outcome 2 (National testing and certification procedures defined). A revised work plan and budget were prepared and reviewed at the Steering Committee Meeting in January 2012. Budgets allotted to completed activities were generally shifted to Activity 3 (awareness raising and marketing campaigns for standards and labels) to help maintain media campaigns.

Use of the Logical Framework as a Management Tool

As discussed in Part 4.1 Conceptualization/Design, the Logical Framework Matrix contained in the Project Document was generally adequate as a tool for results-based management. The targets in the Logical Framework Matrix are a performance based tool for M&E and management.

At the Steering Committee meeting in January 2012, the target of 50,000 replacement refrigerators within the refrigerating appliance replacement program was discussed as untenable considering limited funding available and that the rebate sums as originally planned provide inadequate consumer incentive to exchange appliances. The amount committed by the government (3 million Ghana Cedi) remained the same as in the project document, but due to inflation and depreciation of the Ghana Cedi, the rebate amounts proposed in the project document were not considered incentive enough and there was a need to increase them. As a result, the target for the rebate and exchange program was reduced to 15,000 appliances which could deliver only 30% of the CO₂ emission reductions targeted by the project.

Further, even considering a reduced target of 15,000 appliances, the project progress does not seem adequate to meet targets by the planned project closure. The refrigerating appliance exchange program began in September 2012 on a pilot basis in Accra and Tema. After 8 months, only 2200 units had been purchased under the exchange program and the used appliances delivered to recycling centers. On May 15, 2013, the rebate scheme was started at the national level. 12 months remain before planned project closure. It is important to step up or augment the program to meet appliance distribution and CO₂ emission reduction targets.

Generally, there is a weakness in the progress tracking activities undertaken to verify project impact in terms of GHG emission reductions.

Application of Adaptive Management

The project team has shown commitment and resourcefulness towards completing project activities. In particular, the refrigerating appliance exchange program and used refrigerator appliance

degassing and recycling facility have been major project management successes with good potential for sustainable impact and operation. Stakeholder interviews confirmed the competence and responsiveness of the Energy Commission in developing and implementing activities and programs. The Energy Commission is open to suggestions and opportunities proposed by stakeholders.

In the project document, the CO₂ emission reduction target (251 thousand tCO₂e by the end of year 3) is directly linked to the purchase of 50,000 new energy efficient refrigerating appliances and the decommissioning of 50,000 used inefficient refrigerators in the refrigerator rebate and exchange program. When the rebate and exchange program target was reduced from 50,000 to 15,000 units in January 2012, there seems to have been no measure or activity proposed or pursued by the management team which could compensate the project for lost CO₂ emission reductions.

Based on the on CO₂ emissions reduction data supplied by the project team, of the 251,6 thousand tCO₂ emission reductions targeted for the end of the project in June 2014, only 4.4% (11 thousand tCO₂e) have been accounted for by the exchange of 2200 used refrigerating units with energy efficient models in the pilot rebate and exchange program by the end of May 2013.

Up to the project mid-term, adaptive management has not been adequately applied to address project shortcomings in terms of progress towards meeting global targets. In particular, the project needs to address a tight schedule and inadequate progress towards meeting the CO₂ emission reduction targets outlined in the project document.

Use of Electronic Information Technologies

An attractive and user-friendly project website (www.energyguide.org.gh/) was developed as an outreach tool. The site is accessible in English. All information about the refrigerating appliance exchange program including campaign materials, surveys and label explanations, is available on the site. The website also receives questions from customers and addresses their concerns through email. The website includes simple tips for energy conservation.

Further, the Energy Commission displays commercials, videos and documentaries related to the refrigerating appliance exchange program on its website (www.energycom.gov.gh/).

The project has produced and transmitted commercials for radio and television. One of the biggest successes in terms of consumer awareness raising has been the inclusion of the refrigerating appliance exchange program in an episode of a popular daily television soap opera. The segment lasts over 20 minutes and clearly explains the refrigerating appliance exchange program, explains appliance energy efficiency standards and labels and clearly outlines the advantages of energy efficient appliances.

General Operational Relationships between Institutions

Day-to-day operations are led by the Energy Commission. The Energy Commission has good relationships with various ministries, research, retail and consumers groups. From their position within the Energy Commission, the project team is able to effectively coordinate with other ministries and agencies.

A Steering Committee has been established to ensure coordination between all stakeholders, to provide advice in policy issues, as well as recommendations and advice pertaining to project implementation, and to review and address policy recommendations for the project. The Steering Committee consists of a large number of stakeholders.

Technical Capacities associated with the Project

The project has introduced technical capacity to Ghana in several areas. Appliance retailers and dealers have been trained in appliance standards and label practices. The project has introduced the refrigerating appliance exchange program and refrigerating appliance degassing and recycling facilities with equipment and trained staff.

Based on the review of all available information, the implementation approach was rated moderately satisfactory.

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Monitoring and evaluation

The project submitted a PIR/APR report after the first year of implementation in 2012.

This Mid-Term Evaluation represents the first planned external evaluation of the project progress and results. Quarterly project reviews have been issued but do not adequately address overall project progress towards meeting expected outcomes and targets.

There is a general weakness in the monitoring of progress towards meeting project GHG emission reduction targets. Project activities (specifically outcome 6 and output 7.5) which are designed to strengthen national capacities for monitoring GHG emission reductions have been delayed in the project implementation.

Financial reports have been controlled by external auditors and are in order.

Based on the review of all available information, the monitoring and evaluation was rated moderately satisfactory.

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Stakeholder Participation

The project has a challenging integration of sectors and involves numerous and diverse stakeholders. The involvement of diverse stakeholders during project implementation is good. The Energy Commission continues to seek partnerships with key players (government, utilities, banks, broadcasters) and together developed and implemented activities and programs with broad impact. Diverse stakeholders who were interviewed praised the Energy Commission for its competent, goal-oriented and professional operation. Stakeholders praised the responsiveness of the Energy Commission to suggestions, requests for information and support.

The Steering Committee includes over 20 members and includes a broad representation. Their opinions and suggestions are regularly sought and regarded in project reviews and formulation of activities. Their understanding of project objectives, their roles in the project and expectations are often sought. Maintaining stakeholder interest and commitment to project objectives are clearly driving factors in project implementation. Stakeholders generally agreed;

- i) The dissemination on project information and lessons is good.
- ii) There is good stakeholder participation in project implementation and decision making
- iii) Partnerships and collaborations are being developed by the project with local, national and international entities
- iv) Government institutions are actively involved in project implementation.

The Steering Committee included representatives from main stakeholders involved in the project including:

- Ministry of Energy (MoE)
- Environmental Protection Agency
- Ghana Standards Board
- Energy Foundation
- Ministry of Trade and Industry (MOTI)
- Ghana Revenue Authority - Customs, Excise and Preventive Services (GRA-CEPS)
- Council for Scientific and Industrial Research – Institute of Industrial Research (CSIR-IIR)
- Consumers Association of Ghana (CAG)
- Consumer Protection Agency (CPA)
- Ministry of Environment, Science and Technology and Innovation (MESTI)
- MOFEP
- National Air conditioner and Refrigerators Workshop Owners Association (NARWOA)
- Refrigeration and Air Conditioner Engineers Association of Ghana (RAAG)

Based on the review of all available information, the stakeholder participation during project implementation was rated satisfactory.

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	X					

Financial Planning

Assessment of actual project cost by objectives, outputs, activities

Financial reports have been controlled by external auditors and are in order.

Cost-effectiveness of achievements

Taking into account the discussions and examples from the document Cost Effectiveness Analysis in GEF Projects (GEF/C.25/11, April 29, 2005), the project activities are well balanced.

The project focuses on the “barrier removal” approach and long-term cost-effectiveness. It undertakes a balance of exemplary activities on both the supply- and the demand side.

On the supply side, the project (i) supports the development of minimum efficiency standards; (ii) supports the testing, certification and labeling of project quality; (iii) pilots new distribution mechanisms through retailers and dealers and (iv) provides incentives to producers and dealers.

On the demand side the project (i) educates consumers and professionals about the characteristics, costs, and benefits of energy-efficient products; (ii) reduces retail prices of energy-efficient products through rebates or subsidies; (iii) provides consumer financing; and (iv) offers buy-back and recycling programs.

The project employs a combination of investment, technical assistance, and policy actions at the national and regional level.

The project focuses on removing barriers for cost-effective and proven energy efficient solutions and recognizes the great potential for benefits in Ghana. Enabling activities support training and quality assurance of EE products.

As discussed under Monitoring and Evaluation above, it is necessary that the project team strengthen and implement monitoring tools to tracking project impact particularly with regards project GHG emission reductions. Currently the cost-effectiveness of major project activities including the information campaign are difficult to assess. At the first project Steering Committee meeting in January 2012, project budget was shifted in favor of Outcome 3 awareness raising.

Financial Management

Financial reports have been controlled by external auditors and are in order.

Cofinancing

The Government of Ghana has committed 3 million Ghana Cedis towards the refrigerating appliance rebate program. 50,000 new energy efficient refrigerating appliances were originally targeted in the Project Document. During the initial year, the target was reduced to 15,000 appliances to help assure a rebate which provides a reasonable incentive to consumers.

The project team is seeking strategic partnerships and activities to augment the impact of project activities.

Procurement Management

The implementation team at the Energy Commission is managing procurement in a responsible manner.

One example of good practice was the tendering and contracting of the used refrigerator disposal and recycling facility under Outcome 5. The selected and contracted party - City Waste Management Company (CWMC) in a joint venture with a German company –agreed to finance itself independently through the sales of recycled materials (metals and plastics) and CFCs collected from dismantled refrigerating appliances collected under the rebate scheme. Further, CWMC checks, transports and stores the recovered refrigerators at their own expense. This has allowed the project team to re-allocate some 250,000 USD originally budgeted for the facility under Outcome 5 towards the public awareness campaign under Outcome 3.

CWMC has a vested interest in obtaining working refrigerators since they have a share in the CFC destruction revenue. This helps limit the risk that retailers accept and try to pass on non-functional refrigerators or deliver their own stock of non-functional refrigerators within the rebate program.

Sustainability

The Energy Commission has been instrumental in the development and approval of the following laws and continues to provide support for their implementation and enforcement.

-Legislative Instrument (LI) 1958 Energy Efficiency Standards and Labeling (Household Refrigerating Appliances) Regulations, 2009 and LI 1970 (amended). These have been passed by parliament prior to project start. LI 1958 establishes the minimum energy efficiency standards for refrigerating appliances for sale in Ghana

-LI 1932 banning the importation of used refrigerating appliances came into effect January 1st 2013.

The project supports sustainable impact by promoting a change in consumer behavior with tangible financial benefits. Considering purchase and operation costs together, an energy efficient refrigerator is cheaper for the consumer than a used refrigerator after only 5 years service. The quality is superior, the product service life is longer and the environmental impact is smaller. The advantages for the consumer are transparent.

The project needs to develop and implement further financial models with various stakeholders which are attractive a broad range of consumers and increase sales and market penetration of energy efficient appliances.

Execution and implementation modalities

The project is adhering to UNDP and GEF project management protocols including reporting of progress, finances and work plans with Annual Progress Reports/Project Implementation Reports.

In addition, the Steering Committee and Quarterly Review meetings have been effectively implemented.

Management by the UNDP country office

The UNDP Country Office is active and supportive in project implementation, management and evaluation. The CO is actively involved with the project implementation.

Coordination and operational issues

Day-to-day operations were led by the Energy Commission. Mr. Eric Kumi Antwi-Agyei was assigned the role of Project Coordinator prior to the inception workshop in November 2011.

Under the umbrella of the Energy Commission, the project team is able to successfully coordinate with many other government ministries and agencies.

4.3. Results

Stakeholders interviewed generally agreed that the project has succeeded in creating a momentum for energy efficiency initiatives in Ghana. The Project Team is successfully implementing and achieving major project outputs and outcomes with professionalism and efficiency.

Attainment of Outcomes/Achievement of Objectives

Objective: To improve the energy efficiency of refrigeration appliances in Ghana through the introduction of energy efficiency standards, and demonstration of equipment turn-in and replacement program

TARGET (FROM PRODOC)	ASSESSMENT
Purchase of 50,000 energy efficient refrigeration appliances by year 3 of project implementation	The target of 50,000 new energy efficient appliances was linked with the pilot refrigerating appliance turn-in and rebate program (Output 7) in the Project Document. The funding available from the Government of Ghana for the rebate scheme is cedi 3 million (USD1.5 million). In the first year of project implementation, it was felt that due to inflation, the rebates recommended in the project outline would not provide adequate incentive for consumers to turn-in their old appliances and purchase new ones. As a result, the rebates offered are now higher (about USD \$100 per functioning used refrigerator) and the target number is lower (15,000 new energy efficient appliances introduced and the same number of functioning used appliances removed and recycled) than outlined in the Project Document. The project team is currently reviewing ideas to make up the difference.
<u>GOAL:</u> CO₂ reduction- 251.6 kilotons comprising: - 129.6 kilotons CO₂ abated from energy savings - 122.0 kilotons CO₂ abated from CFCs (ODS) removal	Direct CO ₂ emission reductions targets are calculated based on the 50,000 appliance exchange target outlined above. In particular, 129.6 thousand tCO ₂ is based on the sum of electrical energy saved from 50,000 new appliances (compared to the inefficient appliance they replace) over an 8 year standard appliance lifecycle. The remaining 122.0 thousand tCO _{2eq} is abated from removal and containment of the CFCs from the 50,000 turned-in appliances. The calculation does not currently include emission reductions resulting from the purchase of

	energy efficient refrigerating appliances outside of the rebate scheme. The 70% reduction in the number of appliances targeted for replacement (from 50,000 to 15,000) corresponds to an equivalent 70% cut in CO ₂ emission reductions expected from the rebate program. The project team is currently reviewing ideas to make up the difference.
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OUTCOME 1: Structures and mechanisms for appliance energy efficiency standards and labels (S&L) strengthened

TARGET (FROM PRODOC)	ASSESSMENT
Policy/ institutional/ regulatory framework on energy efficient refrigeration appliances is fully operational	Most of Outcome 1 was completed by the Energy Commission prior to project start. Further, LI 1932 banning the importation of used refrigerating appliances came into effect January 1 st 2013. While not a project deliverable, the legislation is an important basis for the outputs and objectives of the project.
<u>Output 1.1:</u> S&L implementation regulations reviewed through stakeholder consultations	Prior to project start, the Energy Commission was involved in the drafting, review and preparation for approval by parliament of Legislative Instrument 1958 Energy Efficiency Standards and Labeling (Household Refrigerating Appliances) Regulations, 2009 and LI1970 (amended). These have been passed by parliament prior to project start. LI 1958 establishes the minimum energy efficiency standards for refrigerating appliances for sale in Ghana
<u>Output 1.2:</u> Enforcement authority staff and MDAs involved in the S&L program build adequate capacity to implement the program	Prior to project start, the Energy Commission provided consulting and advising services to enforcement authority staff and government ministries, departments and agencies involved in the standards and labeling programme. Human capacity at the Inspectorate Unit of Energy Commission has been boosted to enforce compliance to the energy efficiency labels
<u>Output 1.3:</u> Detailed database on end-use sales and energy use of refrigeration appliances	The project team has requested participating appliance dealers to account and deliver sales data connected to the rebate program. Currently, this data is incomplete and lacks sufficient detail. The data-base should include sales of all labeled appliances, their energy rating and consumptions. As far as possible, the data from as many retailers as possible (not just those involved in the rebate scheme) should be included.

OUTCOME 2: National testing, certification, labeling and enforcement mechanisms and infrastructure adopted

TARGET (FROM PRODOC)	ASSESSMENT
Framework for national testing,	Prior to project start, the Energy commission had completed most activities under this Outcome:

certification, labeling and enforcement mechanisms and infrastructure is fully operational	-National labeling content and format were designed and adopted -The National Testing Procedure for Ghana was developed and adopted -A pilot programme was launched to test and finalize energy efficiency labels.
Output 2.1: National testing and certification procedures are published	Prior to project start, the National Testing Procedure for Ghana GS IEC 62552 - Household Refrigerating Appliances (Characteristics and Test Methods) was developed and adopted.
Output 2.2: At least 150 state inspectors trained nationwide on verification and enforcement procedures by Year 3 of project	Output in development.

OUTCOME 3: Increased consumer's and retailer's awareness and improved marketing of appliance energy efficiency standards and labels

TARGET (FROM PRODOC)	ASSESSMENT
Majority of consumers and retailers become more aware of appliance energy efficiency standards and labels and retailers improve their marketing	
Output 3.1: Enhanced awareness and knowledge of retailers' management and retail staff trained in appliance energy efficiency issues and sales rationales -3 awareness sessions/yr -5 training sessions/yr -75% attendance rate	Training material for major retail outlet representatives around the country has been prepared. Delivery of training sessions are underway. A training workshop was organized and delivered for 520 refrigerating technicians

<p>Output 3.2: Enhanced consumers' awareness of appliance energy efficiency characteristics, standards and labels, and of costs and benefits of more efficient products</p> <p>500,000 households become aware of characteristics of more efficient refrigeration appliances in Year 3</p>	<p>Already in the first year, television and radio campaigns were successfully launched to inform the general public on energy efficient appliances, standards and labels. One of the biggest successes in terms of raising consumer awareness has been the inclusion of the refrigerating appliance exchange program and an explanation of appliance energy standards and labels in an episode of a popular daily television soap opera. The segment lasted over 20 minutes and within the story line clearly explains the refrigerating appliance exchange program, explains appliance energy efficiency standards and labels and outlines the advantages of energy efficient appliances. Further, a documentary and animated film were prepared and aired on television. Jingles and interviews were aired on popular radio programs. Billboards, posters and pamphlets have been prepared to advertise the rebate program.</p> <p>Further, the project has a well-designed web site (www.energyguide.org.gh) that features project activities and videos.</p>
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OUTCOME 4: Establishment of refrigerating appliance test facility

TARGET (FROM PRODOC)	ASSESSMENT
Output 4.1: Refrigeration appliance test facility designed and budgeted	Bid documents were completed in January 2012 and revised for rebidding in 2013
Output 4.2: Refrigeration appliance test facility built and commissioned	<p>Procurement process is underway but experiencing some delay due to budget issues.</p> <p>The Procurement Board has approved a restricted tender addressed to four companies:</p> <ul style="list-style-type: none"> - KTL -Korea - Tesco – US - WAGTECH -UK - KINTE – China <p>WAGTECH UK was the only company to submit a bid out of the four companies. As part of the procurement process, an Evaluation Committee has recommended the selection and this has now gone for approval from the Ministerial Tender Review Board. When approval is given, the contract will be negotiated and awarded.</p>

OUTCOME 5: Establishment of used appliance and ODS collection and disposal facilities

TARGETS (FROM PRODOC)	ASSESSMENT
Output 5.1:	A training workshop has been prepared, organized and delivered

<p>Ghana refrigeration appliance industry understands environmentally friendly technologies and procedures for the collection and disposal of appliances and ODSs - 500 refrigeration technicians undergo capacity building by year 3</p>	<p>for 520 refrigerating technicians in cooperation with the National Air conditioner and Refrigerators Workshop Owners Association (NARWOA)</p>
<p><u>Output 5.2:</u> Bid documents formulated for Used Appliances Collection and Disposal Facilities (UACDFs)</p>	<p>Terms of reference were prepared for selecting operators of the disposal facilities. Bidding process has been successfully completed.</p>
<p><u>Output 5.3:</u> Contract signed for UACDFs</p>	<p>City Waste Management Company has been selected to operate Used Appliances Collection and Disposal Facilities. The company has been involved in electronics waste recycling since 2010. The recycling facility is the result of a joint venture with a German company who has provided the equipment and training.</p>
<p><u>Output 5.4:</u> ODS Disposal Centre designed and implemented</p>	<p>City Waste Management Company has been collecting refrigerators from the rebate scheme since September 2012. The country has been carrying out a test run of its refrigerator recovery equipment since December 2012. The facility was officially launched end of January 2013. The facility is the result of a joint venture with a German company who has provided the equipment and training. The company collects, dismantles and recycles refrigerators received from the rebate program. Market value of recovered CFCs, metals and plastics is helping to ensure the facility is financially sustainable after the end of the project.</p> <p>11.940Kg of R134a refrigerant had been collected by the end of the first quarter 2013. On the average 70g of refrigerant is collected from each refrigerator/freezer. CWMC submits weekly collection reports and reports on the dismantling process.</p> <p>City Waste Management Company (CWMC) hands over the recovered refrigerants to the Ghana Environmental Protection Agency (EPA) who organizes the ODS destruction abroad. The revenue generated from the ODS destruction is split between the Energy Commission, the EPA and CWMC.</p> <p>The project team and City Waste Management are currently considering options to address environmentally responsible recycling of insulation foam components.</p>

OUTCOME 6: Development of efficiency program evaluation and monitoring capacity

TARGETS (FROM PRODOC)	ASSESSMENT
Output 6.1: 30 professionals trained in energy efficiency program monitoring and evaluation study design, methods, technologies and procedures by year 3	Originally planned to begin in the third quarter of year 1. UNDP has started the process to recruit an international consultant who will: <ul style="list-style-type: none"> Facilitate an international workshop to select the appropriate impact evaluation methodology Develop impact methodology Train local professionals that will carry out the efficiency program evaluation Pre-test the impact methodology in Accra/Tema
Output 6.2: Promising monitoring technologies and metering equipment are tested and well-known in Ghana	Originally planned for completion in first quarter of year 2. Activities have not started yet.
Output 6.3: Pilot rebate and turn-in program evaluation and monitoring services are bid and contracted to qualified local professionals	Originally planned for completion in the second quarter of year 2. Activities have not started yet.

OUTCOME 7: Conduct of refrigeration appliance rebate and exchange program throughout Ghana that distribute at least 50,000 efficient appliances

TARGETS (FROM PRODOC)	ASSESSMENT
Output 7.1: Carbon finance options for Pilot Rebate and Exchange Program are accurately estimated and well known	A Carbon Finance Consultant has been selected and a review of carbon finance options has been prepared. Generally, it is felt that the small quantities associated with the rebate program in combination with the efforts required for monitoring and tracking of CO2 gains make it unviable to pursue traditional carbon finance instruments. Other options include project based financing and grants for developing project financing documentation.
Output 7.2: Designs for loan guarantee and capital financing programs that can facilitate implementation of Pilot Rebate and Exchange Program are known and available	The loan facility from ECOBANK has still not been tapped. Meetings have been held with officials of the Bank together with retailers to try to form strategies and options for consumers. Attractive loan schemes need to be implemented to persuade more consumers to trade in their old appliances for energy efficient models.

<p>Output 7.3: The refrigeration appliance rebate and turn in program is documented and available</p>	<p>The general public is being informed of the scheme through newspapers articles, radio, television and internet.</p>
<p>Output 7.4: The organizational and logistical feasibility of the appliance rebate and turn-in program is demonstrated</p>	<p>Refrigerator Appliance Rebate and Exchange Programme was launched in September 2012 and piloted in Accra. 2200 refrigerating appliances have been turned in by May 2013. The national scale rebate scheme roll out started in May 2013. The general public in being informed of the scheme through newspapers articles, radio, television and internet.</p>

OUTCOME 8: Development of various feasible finance models for national scale follow-up of pilot rebate and exchange program

TARGETS (FROM PRODOC)	ASSESSMENT
<p>Output 8.1: Business plans are available for several program follow-up scenarios</p>	<p>National scale rebate and exchange program has been initiated in May 2013. Other follow-up scenarios are being discussed.</p>

Generally, the project team is implementing the project as outlined in the Project Document in a professional, competent and financially responsible manner. A number of activities related to Outcomes 1 and 2 were completed by the Energy Commission prior to project start. This demonstrates motivation and ownership of the project and has helped prepared the foundation for project activities. However, delays in realizing some project activities and shortfalls in meeting expected project targets may jeopardize the project impact and success. It is necessary to prepare a goal-oriented work plan for the remaining project implementation period. Specifically, it is necessary to increase the volume of sales of energy efficient refrigerating appliances by greater public outreach (more regions, more retailers and more financing options) and it is necessary to invest resources and personnel towards M&E activities. It is necessary that the project systematically monitor and track the impact of the project in terms of energy savings, climate change and the environment.

Based on the review of all available information, the attainment of objectives is rated moderately satisfactory.

HS	S	MS	MU	U	HU	N/A
		X				

Sustainability

Financial Resources

The project supports an excellent opportunity for sustainable impact by promoting a change in consumer behavior with tangible financial benefits. Considering both purchase and operation costs, an energy efficient refrigerator is cheaper for the consumer than a used refrigerator after only 5 years service. The quality is superior, the product service life is longer and the environmental impact is smaller. The advantages for the consumer are transparent.

Ghana is a lower middle income country but the population is progressive and the consumers are open to products which provide medium and long-term benefits. The project needs to develop and implement further financial models with various stakeholders which are attractive a broad range of consumers and increase sales and market penetration of energy efficient appliances.

The disposal and recycling facility at City Waste Management Company has proven to be cost efficient and has excellent potential to continue operate independent of project funding following the completion of the project. The facility is the result of a joint venture with a German company and is financially independent of GEF resources. In particular, the sales of recycled materials (metals and plastics) and CFCs collected from dismantled refrigerating appliances collected under the rebate scheme more than compensates the operator for the facility and collection costs. The operators are considering increasing volume by purchasing non-functioning refrigerating appliances and finding economic and environmental solutions to recycle insulation foam components.

Sociopolitical

Domestic refrigeration appliances accounts for a significant portion of the residential electricity consumption in Ghana, and refrigerators are typically the first main appliances to be purchased by households. Some 2 million used refrigerators are in operation in Ghana. The first choice of consumers because of their low purchase price, these appliances become a financial burden in the medium to long term because of their high electricity consumption. By removing the barriers that currently inhibit the market for efficient refrigeration appliances, the project is supporting households and businesses in Ghana to reduce their energy expenditures while improving the quality of life. Considering both the purchase and operation costs, an energy efficient refrigerator is cheaper for the consumer than a used refrigerator after 5 years service. The quality is superior, the product service life is longer and the environmental impact is much less.

Electricity consumption is rising rapidly in Ghana and interruptions caused by system overloading are becoming more frequent. National investments in production and infrastructure are a large burden. The government has made energy efficiency a national priority and supports project efforts.

The energy efficiency initiatives in Ghana are raising considerable interest and awareness in the ECOWAS region. Other regional governments are following the project progress with interest and plans are under discussion to develop common appliance standards and labels for the ECOWAS region.

Institutional Framework and governance

The Energy Commission has been instrumental in the development and approval of the following laws and continues to provide support for their implementation and enforcement.

-Legislative Instrument (LI) 1958 Energy Efficiency Standards and Labeling (Household Refrigerating Appliances) Regulations, 2009 and LI 1970 (amended). These have been passed by parliament prior to project start. LI 1958 establishes the minimum energy efficiency standards for refrigerating appliances for sale in Ghana

-LI 1932 banning the importation of used refrigerating appliances came into effect January 1st 2013.

The Energy Commission and its achievements over the past few years have been highly recognized and respected by a broad stakeholder base ranging from diverse government ministries to industrial partners, utilities, SMEs, universities and the general public. The Energy Commission is regionally and internationally active and respected as national focal point for EE activities in Ghana. Their involvement in the project strengthens their reputation and role in the country and in the region.

Environmental

The project achieves environmental sustainability on several levels.

1. By introducing and promoting appliance standards and labels, the project is supporting the market penetration of EE appliances and products beyond the project scope. This reduces GHG emissions resulting from electricity production.
2. By creating used appliance collection and recycling facilities, the project reduces environmental waste, reintroduces recycled materials to the supply chain and reduces the necessity for additional resource extraction and production.
3. By creating sustainable facilities and protocols for the collection and disposal of environmentally harmful substances including Ozone Depleting Substances

Based on the review of all available information, the sustainability was rated satisfactory.

HS	S	MS	MU	U	HU	N/A
	X					

Contribution to upgrading skills of the national staff

The project supports the operation, competence building and reputation of the Energy Commission in Ghana. As a focal point for energy policy and implementation activities, the Energy Commission provides training and workshops for ministries, for inspection bodies, for research, industry, consumer groups. Several ministries, in particular the Ministry of Energy and the Ministry of Industry and Trade have been reinforced institutionally by the Energy Commission/UNDP unit during project implementation and has co-operated closely and successfully with it.

4.4. UNDP comparative advantage

The project builds upon UNDP's active participation and experiences in projects and programmes supporting energy efficiency, institutional capacity building and human development in the region. In addition, the UNDP is acknowledged for its strong ability to work at the local level with local stakeholders. As evident in this and other projects in the region, UNDP is in a favourable position to assist the country in absorbing international support.

Based on the review of all available information, the use of comparative advantage was rated satisfactory.

HS	S	MS	MU	U	HU	N/A
	X					

5. Recommendations

The evaluator concludes that the design and implementation of the project has good potential for impact the project's performance – both with regard to managerial and financial aspects as well as with regard to contents and results – is positive.

Corrective actions for the design, implementation, monitoring and evaluation of the project.

1. CO₂ Emission Reduction Targets. The project target for direct CO₂ emission reductions outlined in the Project Document is 251,600 tCO₂. In the project design this target is linked to the replacement of 50,000 refrigerators through the appliance turn-in and rebate program. Considering the variety of activities and results realized to date, it is recommended that detailed appliance sales surveys be carried out to better assess the impact of the project on the EE appliance market in Ghana. The surveys should include data from a broad sample of dealers (not just those involved in the rebate program) and include the energy rating/consumption of appliances sold. These surveys should form the basis for calculating the CO₂ emission reductions achieved by the project.

Changes to project strategy, including log frame indicators and targets

2. Appliance Purchase Program. A variety of financing models need to be developed and marketed to attract a broad range of consumers to purchase energy efficient refrigerators instead of used refrigerators. Suggestions include;
 - a. Payment by Installments. If the down-payment for a new EE refrigerator is similar to the price of a used refrigerator and the monthly installments are manageable and offset by reduced utility costs, the end-consumer can better rationalize the investment.
 - b. Involve the Utilities. Savings in electricity bills can be leveraged against the purchase costs of EE appliances by means of revolving funds.
 - c. Interest Free Bank Loans. For consumers who have a bank account, a regular income and bank approvals, the project can cover interest costs
3. National Scale Exchange Program. Many stakeholders felt that the refrigerating appliance turn-in and rebate program should include more brands, more dealers and a broader regional base before project end.
4. Refrigerator Testing, Certification and Labeling. The development of a testing and certification facility has been delayed due to scheduling and financial limitations. Because consumers are already looking for labelled appliances, it is recommended that manufacturers have appliances certified at recognized international testing facilities before import. The Ministry of Industry and Trade should distribute a list of 8 to 10 international accredited test facilities where appliances can be certified.

Actions to follow up or reinforce initial benefits of the project

5. Publicity Campaigns. The radio, television, print media and internet campaigns to date have been well conceived and implemented. Financing of the campaigns requires considerable budget and it is recommended that the project seek in-kind support from sponsors
 - a. Radio/television stations can donate air time
 - b. Appliance makers, wholesalers and retailers can sponsor campaigns
6. Project Extension. In order to implement the remaining outputs and to properly consider and implement the recommendations above, it is recommended that the project plan for an extension of 6 to 12 months.

Proposals for future directions underlining main objectives

7. Target EE Labels for All Appliances.
8. Regional Collaborations There is great opportunity for regional collaboration within the ECOWAS region. For example, the testing facilities being developed in this project could be used by all manufacturers and importers in the region. Under this scheme, it is possible that an appliance certified in one country could be recognized and adopted by neighboring countries.
9. EE interventions in other sectors. The Energy Commission should further develop their competence to cover energy efficiency in other sectors including building, industry, transport and tourism. As the national point-of-contact for energy efficiency and renewable energy issues, the Energy Commission should be actively involved in promoting and initiating legislative reforms to improve the energy efficiency in all sectors.

6. Lessons learned

1. Such projects benefit enormously from the political will from the government side. The project is technically sound with a good range of activities in the areas of legislation, awareness raising and demonstration all of which have received support. Government and stakeholder involvement during preparation and implementation is positive and the government has given the project national priority.
2. Capable leadership is essential for keeping projects moving and meeting objectives. As a national focal point for energy projects, the Energy Commission has shown capacity, influence and flexibility in developing implementing the project. Further, the project builds on and benefits from the experiences of previous projects carried out by the Energy Commission
3. Sound knowledge and understanding of the local situation is essential for project design and implementation.
4. The evaluator considers a major point for the success of the project was the fact that it attempted to address the strong need for energy efficiency in Ghana through the promotion and support of an effective and financially sustainable measure. The project works intensively with EE refrigerating appliances at many levels, from quality assurance through standards and testing on one end and the development and implementation of broad distribution and turn-in programs on the other.
5. The co-operation between UNDP and the Energy Commission can be qualified as good. It constitutes one of the major aspects leading the success of the project.
6. The establishment of the used appliance and ODS collection and disposal facility is a good practice example which can be applied in other projects. Under the contract between the Energy Commission, the Environmental Protection Agency and City Waste Management Company, the facility is self-financed by the collection and sale of recycled material (plastic, metals and eventually foam) and a share of the revenues from the ODS recovery and destruction. The facility operators (CWMC) were able to attain state-of-the-art equipment for WEEE Standard recycling through a joint venture with a European Company and have taken on the collection, testing, draining, dismantling and recycling of the used appliances recovered from the rebate program. Their share in the revenues from ODS destruction, help mitigate the risk that non-functioning refrigerators are accepted under the rebate program.
7. In the Logical Framework, the project's global GHG emission reduction target is linked to the success of one outcome (the exchange of 50,000 used refrigerators with 50,000 new energy efficient models under the rebate and exchange program in Output 7.) The project has a good mix of measures – legislative, capacity building, certification and awareness raising. The expected individual and combined impacts of this mix of measures should be reflected in the direct and indirect GHG emission reduction targets and progress monitoring.



INDIVIDUAL CONSULTANT PROCUREMENT NOTICE

Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana

Date: 13th February, 2013

Country: Ghana

Description of the assignment: The consultant will conduct the Mid Term Evaluation the project on *Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana*.

Period of assignment/services: April-May 2013

Proposals should be submitted to Louis Kuukpen, email address: louis.kuukpen@undp.org and Paolo Dalla Stella, email address paolo.d.stella@undp.org no later than 3rd March 2013.

Any request for clarification must be sent in writing, or by standard electronic communication to the address or e-mail indicated above. The Procurement Unit will respond in writing or by standard electronic mail and will send written copies of the response, including an explanation of the query without identifying the source of inquiry, to all consultants.

1. BACKGROUND

The “Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana” project, being implemented since 2011 by the Energy Commission with funding from UNDP and GEF, seeks to promote energy efficiency standards for refrigeration appliances in Ghana, and demonstrate replicable and scalable equipment turn-in and replacement program that removes inefficient and environmentally damaging appliances from the market and replaces them with more efficient and environmentally friendly models. By removing the barriers that currently inhibit the adoption of efficient refrigeration appliances, the project aims to allow Ghanaian households and businesses to reduce their energy expenditures while improving quality of life. Potential annual energy savings range from 30 percent to 50 percent depending on the success level of market transformation incentives and programs.

In line with the requirement of the project document, the project must be subjected to at least two independent external evaluations, namely the Mid-Term and the Terminal Evaluations. The objective of this assignment is to undertake an independent Mid-Term Evaluation of the project.

2. DUTIES AND RESPONSIBILITIES AND DESCRIPTION OF THE PROPOSED ANALYTICAL WORK (more details in the TOR – Annex A)

Duties and Responsibilities:

The international consultant will work under the oversight of UNDP CO Ghana, and in collaboration with the Energy Commission.

The consultant will conduct the MTE to meet the following objectives:

1. Determine progress being made towards the achievement of outcomes;
2. Focus on the effectiveness, efficiency and timeliness of project implementation;
3. Highlight issues requiring decisions and actions;
4. Present lessons learnt and best practices about project design, implementation and management, and state how they can be applied to future and other on-going projects;
5. Examine the performance of the project since the beginning of its implementation as measured against planned outputs set forth in the Project Document in accordance with rational budget allocation and the assessment of features related to the process involved in achieving those outputs, as well as the initial and potential impacts of the project;
6. Address underlying causes and issues contributing to targets not adequately achieved;
7. Identify weaknesses and strengths of the project design;
8. Recommend any necessary changes in the overall design and orientation of the project by evaluating the adequacy, efficiency, and effectiveness of its implementation, as well as assessing the project outputs and outcomes to date;
9. Assess if there is evidence that sustainability of benefits is being built into the project (institutional and financial capacity).

Deliverables:

1. The Consultant will produce the following deliverables to UNDP/GEF, UNDP Country Office in Ghana and the Project Management Unit based at the Energy Commission:
2. Inception report, 3-4 days after start, comprising a detailed work plan, including any questionnaires, specific questions and adjusted time schedule to deliver on the assignment. A presentation of the findings to key stakeholders;
3. Draft Evaluation Report within 1 week after visit
4. Final Detailed Evaluation report within 1 week after comments on the draft report in accordance with the structure of the sample report outline provided at Annex 2; The Report will also contain annexes prepared by the consultant including TOR, itinerary, List of persons interviewed, summary of field visits, list of documents reviewed, questionnaires and summary of results, co-financing and leveraged resources, etc..
5. A presentation of the findings to key stakeholders at the end of the Mission;
6. An executive summary including findings and recommendations, and an overall rating of the project based on GEF Rating Scales provided in Annex 3;

3. REQUIREMENTS FOR EXPERIENCE AND QUALIFICATIONS

Competencies:

- Excellent communication (spoken and written) skills
- Excellent writing, analytical and research skills
- Showing strong attention to details

- Excellent interpersonal skills
- Ability to work in a multicultural and international environment
- Ability to work under pressure and to meet tight deadlines

Qualifications:

- At least a first degree in science or engineering with a minimum of six years relevant experience in energy efficiency or related field.
- Must have undertaken at least 3 Mid-Term and/or Final Evaluations, including one in the field of Energy Efficiency, preferably for a similar UNDP/GEF project;
- Demonstrated ability to assess complex situations, succinctly distils critical issues, and draw forward-looking conclusions and recommendations;
- Highly knowledgeable of GEF and UNDP-GEF monitoring and evaluation policies procedures an advantage;
- Familiarity with Ghana or any Developing Countries;
- Excellent in human relations, coordination, planning and team work.
- Have exemplary written and oral communication skills in English, be fully IT literate

4. DOCUMENTS TO BE INCLUDED WHEN SUBMITTING THE PROPOSAL

Interested individual consultants must submit the following documents/information on behalf of the team to demonstrate their qualifications:

1. Letter of interest
 - Explaining why the consultant is the most suitable for the work
 - Provide a brief methodology on how the consultant will approach and conduct the work
2. Financial proposal
3. Personal CV including past experience in similar projects and at least three references. The CVs of eventual assistant’s consultants should be included.

5. FINANCIAL PROPOSAL

Lump sum contract

The financial proposal shall specify a total lump sum amount, and payment terms around specific and measurable (qualitative and quantitative) deliverables (i.e. whether payments fall in installments or upon completion of the entire contract). Payments are based upon output, i.e. upon delivery of the services specified in the TOR. In order to assist the requesting unit in the comparison of financial proposals, the financial proposal will include a breakdown of this lump sum amount (including travel, per diems, number of anticipated working days).

6. EVALUATION

The weighted scoring method will be utilized.

The award of the contract should be made to the individual consultant whose offer has been evaluated and determined as:

- a) responsive/compliant/acceptable, and

b) Having received the highest score out of a pre-determined set of weighted technical and financial criteria specific to the solicitation.

* Technical Criteria weight: 70%

* Financial Criteria weight: 30%

Criteria	Weight	Max. Point
1) Technical	70 %	70
<u>Qualifications of Consultant</u>	20%	20
Academic Qualification		8
Knowledge of Energy Efficiency		8
Knowledge of UNDP/GEF policies		4
<u>Professional Experience of Consultant</u>	30%	30
Relevant experience in conducting mid-term / final evaluations		15
Relevant experience in the energy efficiency field		10
Relevant experience in Ghana or developing countries		3
Relevant experience with UNDP/GEF		2
<u>Proposed approach and understanding of the assignment</u>	20%	20
2) Financial	30%	30
<u>TOTAL</u>	100%	100

ANNEX

ANNEX A- TERMS OF REFERENCES (TOR)

ANNEX A: TERMS OF REFERENCE



Empowered Lives

Resilient Nations

***Terms of Reference for the Mid Term Evaluation of the UNDP-GEF
“Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating
Appliances Market in Ghana” Project***

TITLE	International Consultancy Services - Mid Term Evaluation
SECTOR	Energy Sector
LOCATION	Republic of Ghana
DUTY STATION	Accra
ASSIGNMENT	Mid Term Evaluator
DURATION	15 working days over 1.5 months (1 mission - overall duration of 5 working days in Ghana)
STARTING DATE	April 2013

1.0 BACKGROUND

Refrigerating appliances consume an average of 1,140 kWh/year in Ghana, or approximately three times more energy than the maximum allowed in countries with robust standards and labelling programs. Such inefficient appliances result in US\$50 to US\$100 per year of potentially unnecessary electricity expenses for a typical owner which he/she can ill-afford. The wasteful consumption of electricity results in more than 0.7 tons per year of CO₂ emissions per appliance, and uncontrolled release of ozone depletion substances (ODS) from used appliances can result in the equivalent of another 2 tons of CO₂ every time an inefficient, used appliance is improperly disposed or replaced. With about 2 million inefficient refrigeration appliances in use throughout Ghana, the economic cost of such inefficiency is many hundreds of millions of dollars to the national economy, while the avoidable greenhouse gas emissions is many millions of tons of CO₂ over the long term. Such economic and environmental damage needs to be mitigated by replacing inefficient, used refrigeration appliances in Ghana with more efficient and environmentally friendly versions of the same appliance.

As the standard of living in Ghana improves, energy expenditures are expected to grow rapidly as more people obtain electricity and purchase refrigeration and space conditioning appliance for their basic comfort and household energy needs. Domestic refrigeration appliances accounts for a significant portion of the residential electricity consumption in Ghana, and refrigerators are the first main appliances to be purchased by households. Domestic refrigeration appliances present a significant potential for energy efficiency improvement

(typically 50 percent in cost effective energy savings) and appear always as a priority in any market transformation strategy.

The “Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana” project, being implemented since 2011 by the Energy Commission with funding from UNDP and GEF, seeks to promote energy efficiency standards for refrigeration appliances in Ghana, and demonstrate replicable and scalable equipment turn-in and replacement program that removes inefficient and environmentally damaging appliances from the market and replaces them with more efficient and environmentally friendly models. By removing the barriers that currently inhibit the adoption of efficient refrigeration appliances, the project aims to allow Ghanaian households and businesses to reduce their energy expenditures while improving quality of life. Potential annual energy savings range from 30 percent to 50 percent depending on the success level of market transformation incentives and programs.

The project’s global objective is to reduce Ghana’s energy-related CO₂ and ozone depleting substance (ODS) emissions by mitigating the demand for energy in the country’s refrigeration and air conditioning sector and by encouraging recovery, recycling and/or destruction of environmentally damaging refrigerants. This is being accomplished through the implementation of energy efficiency measures and standards for refrigeration appliances and also through the creation of a turn-in and replacement program for inefficient appliances and the ODS that they contain.

This project is being implemented with budget support from the Global Environment Facility (GEF), the United Nations Development Programme (UNDP) and the Government of Ghana, UNDP being the GEF Implementing Agency and the lead executing agency is the Energy Commission, the.

The project is being executed through eight principal components:

- i. Strengthening of regulatory and institutional framework
- ii. Design of certification, labeling and enforcement systems
- iii. Training and public outreach
- iv. Establishment of refrigerating appliance test facility
- v. Used appliance collection and disposal facilities
- vi. Efficiency program evaluation and monitoring capacity development
- vii. Conduct of refrigeration appliance rebate and exchange program
- viii. Financial design of follow-up national market transformation programs

The project has the following outcomes:

- i. Structures and mechanisms for implementation of appliance energy efficiency standards and labels (S&L) strengthened
- ii. National testing, certification, labeling and enforcement mechanisms adopted
- iii. Increased consumer’s and retailer’s awareness and improved marketing of appliance energy efficiency standards and labels
- iv. Establishment of refrigerating appliance test facilities
- v. Establishment of used appliance and ODS collection and disposal facilities
- vi. Development of efficiency program evaluation and monitoring capacity

- vii. Conduct of refrigeration appliance rebate and exchange program throughout Ghana that distribute at least 50,000 efficient appliances
- viii. Development of various feasible finance models for national scale follow-up of pilot rebate and exchange program

In line with the requirement of the project document, the project must be subjected to at least two independent external evaluations, namely the Mid-Term and the Terminal Evaluations. The objective of this assignment is to undertake an independent Mid-Term Evaluation of the project. This evaluation will take into consideration:

- (a) GEF Monitoring and Evaluation Policy
(<http://www.thegef.org/gef/node/4184>)
- (b) UNDP-GEF Monitoring and Evaluation Policy
(<http://web.undp.org/evaluation/policy.htm>)

2.0 EVALUATION OBJECTIVES

The Mid-Term Evaluation (MTE) is initiated by the UNDP Country Office in Ghana in order to assess the overall project progress, make sure the project is on track to deliver the agreed outcomes, and to produce recommendations on any adjustments needed.

The main objectives of the MTE are to:

- Determine progress being made towards the achievement of outcomes;
- focus on the effectiveness, efficiency and timeliness of project implementation;
- highlight issues requiring decisions and actions;
- present lessons learnt and best practices about project design, implementation and management, and state how they can be applied to future and other on-going projects;
- examine the performance of the project since the beginning of its implementation as measured against planned outputs set forth in the Project Document in accordance with rational budget allocation and the assessment of features related to the process involved in achieving those outputs, as well as the initial and potential impacts of the project;
- address underlying causes and issues contributing to targets not adequately achieved;
- identify weaknesses and strengths of the project design;
- recommend any necessary changes in the overall design and orientation of the project by evaluating the adequacy, efficiency, and effectiveness of its implementation, as well as assessing the project outputs and outcomes to date;
- assess if there is evidence that sustainability of benefits is being built into the project (institutional and financial capacity)
- provide detailed recommendations on the work plan for the remaining project period and to assess early signs of the project success or failure, and prompt any necessary adjustments.

Findings of the MTE will be incorporated as recommendations for enhanced implementation during the remainder of the project's term.

Within this context, UNDP Ghana would like to recruit an international consultant to undertake the evaluation.

3.0 SCOPE OF THE MID TERM EVALUATION

The evaluation will focus on a range of aspects as elaborated at Annex 1. In addition to a descriptive assessment, all criteria marked with **(R)** should be rated with the 6 point GEF/UNDP rating scales shown at Annex 3, by using the following divisions: *Highly Satisfactory (HS)*, *Satisfactory(S)*, *Moderately Satisfactory (MS)*, *Moderately Unsatisfactory (MU)*, *Unsatisfactory (U)*, *Highly Unsatisfactory (HU)*. All ratings given should be properly substantiated:

PROJECT FORMULATION

- ***Conceptualization/Design (R):***
 - a. Assess the efficiency of project planning.
 - b. Assess whether the approach used in design and selection of project interventions addressed the root causes and principal threats in the project area.
 - c. Assess the logical framework and determine whether the different project components and activities proposed to achieve the objectives were appropriate, viable and responded to contextual, institutional, legal and regulatory settings of the project.
 - d. Assess the adequacy of indicators for guiding implementation and measurement of achievement.
 - e. Assess to what extent lessons and experiences from other relevant projects were incorporated into the design.

- ***Stakeholder participation (R):***
 - a. Assess the adequacy of involvement of the relevant stakeholders through information-sharing, consultation, and their participation in the project's design.
 - b. Assess whether the project adequately consulted and made use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the design of project activities.

PROJECT IMPLEMENTATION

- ***Implementation Approach (R):***
 - a. Assess the use of the project's logical framework as a management tool during implementation and any changes made to it.
 - b. Assess other elements that reflect adaptive management (e.g., comprehensive and realistic work plans routinely developed) and any changes in management arrangements to enhance implementation.
 - c. Assess use/establishment of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.
 - d. Assess the general institutional arrangements and operational relationships between institutions involved and others, and how these relationships have contributed to effective implementation and achievement of project objectives.

- e. Assess the technical capacities associated with the project and their role in project development, management and achievements.
- f. Assess stakeholder participation during the implementation of the project.

- ***Monitoring and Evaluation (R):***

- a. Assess to what extent there has been supervision of activities during project implementation.
- b. Assess progress against predetermined indicators as per the logical framework.
- c. Assess the extent to which inputs, work schedules, other required actions and outputs are proceeding according to plans.
- d. Examine if the monitoring framework is in place and is being adequately implemented and hence generating critical information needed to manage the project.

- ***Stakeholder participation (R):***

- a. Assess to what extent local stakeholders participated in project management and decision-making. Include an analysis of the strengths and weaknesses of the approach adopted by the project and suggestions for improvement, if necessary.
- b. Assess whether the project consulted and made use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the implementation and evaluation of project activities.
- c. Assess the adequacy of the dissemination of project information to partners and stakeholders and if necessary suggest more appropriate mechanisms.
- d. Provide an over-all assessment of project implementation as per the 6-point UNDP/GEF rating scale for project implementation (see Annex 3).

RESULTS

- ***Attainment of Outcomes/Achievement of Objectives (R):***

- a. Assess whether the project has made the expected progress towards achievement of intended outputs and outcomes/measurement of change.
- b. Assess the level of achievement of project outcomes and objectives based on the following three criteria:
 - *Relevance*: Are the project's outcomes consistent with the focal areas/operational program strategies and country priorities?
 - *Effectiveness*: Are the actual project outcomes commensurate with the original or modified project objectives? In case the original or modified expected results are merely outputs/inputs then the evaluators should assess if there are any real outcomes of the project and if yes then whether these are commensurate with the realistic expectations from such a project. Will the achievement of outputs and outcomes lead to the attainment long-term objective/impacts of the project?
 - *Efficiency*: Is the project cost effective? Is the project the least cost appropriate option? Is the project implementation delayed and if it is, then does that affect cost-effectiveness? Has the level of co-finance influenced the project's result? Wherever possible, the evaluator should also compare the cost-time vs. outcomes relationship of

- the project with that of other similar projects. Evaluator should also consider that list cost option may not necessarily be the most appropriate (cost versus results)
- c. Assess the whole project for relevance, effectiveness, efficiency and sustainability. This includes assessing to which extent organizational structure, managerial support and coordination mechanism used by UNDP supports the project/programme

ANALYSIS OF USE OF COMPARATIVE ADVANTAGE (R)

For the UNDP Country office specifically, it is important to highlight the overall contribution of the project to the Energy focal area where the UNDP in Ghana is said to have a comparative advantage by virtue of its on-the-ground presence and good relations with stakeholders.

4.0 DELIVERABLES

The Consultant will produce the following deliverables to UNDP/GEF, UNDP Country Office in Ghana and the Project Management Unit based at the Energy Commission:

- a) Inception report, 3-4 days after start, comprising a detailed work plan, including any questionnaires, specific questions and adjusted time schedule to deliver on the assignment. A presentation of the findings to key stakeholders;
- b) Draft Evaluation Report within 1 week after visit
- c) Final Detailed Evaluation report within 1 week after comments on the draft report in accordance with the structure of the sample report outline provided at Annex 2; The Report will also contain annexes prepared by the consultant including TOR, itinerary, List of persons interviewed, summary of field visits, list of documents reviewed, questionnaires and summary of results, co-financing and leveraged resources, etc..
- d) A presentation of the findings to key stakeholders at the end of the Mission;
- e) An executive summary including findings and recommendations, and an **overall rating** of the project based on GEF Rating Scales provided in Annex 3;

The report together with the annexes shall be written in English and shall be presented electronically in MS Word format. The consultant must bring his/her own computing equipment;

The selected consultant will have to complete the sample statement of ethics provided at Annex 2, and to submit same as an annex to the evaluation report.

The views of key stakeholders will be sought on the draft evaluation report and any contradictory views shall be included as an annex to the final report.

5.0 RESOURCES AND LOGISTICAL SUPPORT

In order to obtain the necessary information, the evaluators are expected to consult the stakeholders as well as appropriate documents to be provided by the latter. The main stakeholders concerned by the project are as follows:

- UNDP Country Office
- Energy Commission
- Ghana Standards Authority

- Environmental Protection Agency
- Other Ministries and Organizations on the Steering Committee
- GEF Operational Focal Point

5.1 Reporting lines

The consultant will report to the Head of the Sustainable Development Cluster at UNDP. UNDP and the Project Management Unit team at the Energy Commission will jointly review the assignment's deliverables.

5.2 Duty Station

The consultant will work from their home country and will only be required in Accra during the 5 days mission over the assignment period.

5.3 Administration Arrangements

The Consultant will be provided with office space at the Energy Commission. The consultant is expected to bring his/her own laptop, photography equipment etc.

5.4 Travel Arrangements

During the evaluation, the consultant will be expected to meet with the stakeholders as well as the Project Steering Committee. The project management unit will provide transport within Accra during the 5 days mission period.

5.6 Duration

The contract will be spread over a period of 45 days but the consultant is expected to carry out the assignment in 15 days worked and certified, out of which 5 days which will be a mission to Accra.

5.7 Payment

The consultant will be paid upon satisfactory delivery. The draft final report should be submitted to UNDP Ghana and Project Management Unit, for necessary comments from stakeholders, **within one week** after completion of the mission to Ghana. The consultant will finalize the report within **one week** upon receiving comments and feedback from the stakeholders.

6.0 TIME FRAME

The evaluation will take place in **April-May 2013** and it requires a **5-day** country mission in Ghana as well as a desk review (prior to the country mission) and drafting and finalization of the report (following the country mission).

7.0 COMPETENCIES

- Excellent communication (spoken and written) skills
- Excellent writing, analytical and research skills
- Showing strong attention to details
- Excellent interpersonal skills
- Ability to work in a multicultural and international environment
- Ability to work under pressure and to meet tight deadlines

8.0 QUALIFICATIONS & EXPERIENCE

- At least a first degree in science or engineering with a minimum of six years relevant experience in energy efficiency or related field.
- Must have undertaken at least 3 Mid-Term and/or Final Evaluations, including *one* in the field of Energy Efficiency, preferably for a similar UNDP/GEF project;
- Demonstrated ability to assess complex situations, succinctly distils critical issues, and draw forward-looking conclusions and recommendations;
- Highly knowledgeable of GEF and UNDP-GEF monitoring and evaluation policies procedures an advantage;
- Familiarity with Ghana or any Developing Countries;
- Excellent in human relations, coordination, planning and team work.
- Have exemplary written and oral communication skills in English, be fully IT literate

9.0 LANGUAGE:

The language of the assignment shall be English. All deliverables shall be in English language. Therefore, excellent English communication skills (oral, written, and presentation) are essential.

10.0 MODE OF APPLICATION

As indicated in the Procurement Notice.

ANNEXES :

Annex 1 : Mid-Term Evaluation Report Sample Outline

Annex 2 : GEF Monitoring and Evaluation Principles – Ethics Draft Text

Annex 3 : Ratings Guidelines for GEF Project Progress

ANNEX 1

MID-TERM EVALUATION REPORT SAMPLE OUTLINE

Note: The consultant is expected to follow this outline in preparing the report

Table of contents

Acronyms

1. Executive summary including an overall rating of the project

(using the 6 point GEF/UNDP rating scale).

- Brief description of project;
- Context and purpose of the evaluation;
- Main conclusions, rating of progress towards objectives as well as rating of progress on implementation, recommendations and lessons learnt;

2. Introduction

- Purpose of the evaluation;
- Key issues addressed;
- Methodology of the evaluation;
- Structure of the evaluation.

3. The project(s) and its development context

- Project start and its duration;
- Problems that the project seek to address;
- Immediate and development objectives of the project;
- Main stakeholders;
- Results expected.

4. Findings and Conclusions

In addition to a descriptive assessment, all **criteria marked with (R) should be rated** in conformity with the GEF/UNDP guidelines for final evaluations using the following divisions: Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

4.1 Project Formulation

- *Conceptualization/Design(R)*. This should assess whether the approach used in design and selection of project interventions addressed the root causes and principal threats in the project area. It should also include an assessment of the logical framework and whether the different project components and activities proposed to achieve the objectives were appropriate, viable and responded to contextual institutional, legal and regulatory settings of the project. It should also assess the indicators defined for guiding implementation and measurement of achievement and whether lessons from other relevant projects (e.g., same focal area) were incorporated into project design.
- *Country-ownership/Driveness*. Assess the extent to which the project idea/conceptualization had its origin within national, sectoral and development plans and focuses on national environment and development interests.

- *Stakeholder participation (R)* Assess information dissemination, consultation, and “stakeholder” participation in design stages.
- *Replication approach.* Determine the ways in which lessons and experiences coming out of the project were/are to be replicated or scaled up in the design and implementation of other projects (this also related to actual practices undertaken during implementation).
- *Linkages* between the project and other interventions within the sector and the definition of clear and appropriate management arrangements at the design stage. This element should also address the question of to what extent the project addresses UNDP priorities; gender, south-south cooperation, poverty-environment linkages (sustainable livelihoods) and disaster prevention and recovery.

4.2 Project Implementation

- *Implementation Approach (R).* This should include assessments of the following aspects:
 - (i) The use of the logical framework as a management tool during implementation and any changes made to this as a response to changing conditions and/or feedback from M & E activities if required.
 - (ii) Other elements that indicate adaptive management such as comprehensive and realistic work plans routinely developed that reflect adaptive management and/or; changes in management arrangements to enhance implementation.
 - (iii) The project's use/establishment of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.
 - (iv) The general operational relationships between the institutions involved and others and how these relationships have contributed to effective implementation and achievement of project objectives.
 - (v) Technical capacities associated with the project and their role in project development, management and achievements.
- *Monitoring and evaluation (R).* Including an assessment as to whether there has been adequate periodic oversight of activities during implementation to establish the extent to which inputs, work schedules, other required actions and outputs are proceeding according to plan; whether formal evaluations have been held and whether action has been taken on the results of this monitoring oversight and evaluation reports.
- *Stakeholder participation (R).* This should include assessments of the mechanisms for information dissemination in project implementation and the extent of stakeholder participation in management, emphasizing the following:
 - (i) The production and dissemination of information and lessons generated by the project.

- (ii) Local resource users and NGOs participation in project implementation and decision making and an analysis of the strengths and weaknesses of the approach adopted by the project in this arena.
- (iii) The establishment of partnerships and collaborative relationships developed by the project with local, national and international entities and the effects they have had on project implementation.
- (iv) Involvement of governmental institutions in project implementation, the extent of governmental support of the project.
- *Financial Planning:* Including an assessment of:
 - (i) The actual project cost by objectives, outputs, activities
 - (ii) The cost-effectiveness of achievements
 - (iii) Financial management (including disbursement issues)
 - (iv) Co-financing
- *Procurement Management:* Including an assessment of:
 - (i) Technical and human resource capacity for procurement management
 - (ii) Linkage between work programming, procurement planning, budgeting, and disbursement planning
 - (iii) Effectiveness of procurement management, as indicated by results of audits (internal and/or external), and reports of review and supervision missions by IAs.
- *Sustainability.* Extent to which the benefits of the project will continue, within or outside the project domain, after it has come to an end. Relevant factors include for example: development of a sustainability strategy, establishment of effective and appropriate financial and economic instruments and mechanisms, mainstreaming project objectives into the economy or community production activities.

4.3. Results

- *Attainment of Outcomes/ Achievement of objectives (R):* Including a description and rating of the extent to which the project's objectives (environmental and developmental) were achieved using Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U) and Highly Unsatisfactory (HU) ratings. If the project did not establish a baseline (initial conditions), the evaluators should seek to determine it through the use of special methodologies so that achievements, results and impacts can be properly established.

This section should also include reviews of the following:

- *Sustainability*: Including an appreciation of the extent to which benefits continue, within or outside the project domain after GEF assistance/external assistance in this phase has come to an end.
- *Contribution to upgrading skills of the national staff*

4.4. Analysis of Use of Comparative Advantage (R)

Overall contribution of the project to the Energy focal area where the UNDP in Ghana is said to have a comparative advantage by virtue of its on-the-ground presence and good relations with stakeholders.

5. Recommendations

- Corrective actions for the design, implementation, monitoring and evaluation of the project. Recommendations should be specific and clearly justified in relation to the achievement of the project objectives.
- Actions to follow up or reinforce initial benefits from the project
- Proposals for future directions underlining main objectives
- Changes to project strategy, including the log frame indicators and targets

6. Lessons learned

- This should highlight the 'best' and 'worst' practices in addressing issues relating to relevance, performance and success.

7. Evaluation report Annexes

- Evaluation TORs
- Itinerary
- List of persons interviewed
- Summary of field visits, issues raised and recommendations by different stakeholders
- List of documents reviewed
- Questionnaire used and summary of results
- Comments by stakeholders (only in case of discrepancies with evaluation findings and conclusions)

EXAMPLE OF METHODOLOGY OUTLINE:

It is anticipated that the methodology to be used for the MTE will include, but may not be limited to the following:

A) Documentation review including, *inter alia*:

- Project Document and Project Appraisal Document;
- Project implementation reports (PIR's);
- Quarterly progress reports and work plans of the various implementation task teams;
- Audits reports
- Annual Review Reports
- M & E Operational Guidelines, all monitoring reports prepared by the project;
- Financial and Administration guidelines;

The following documents will also be available:

- The project work plan;

- Knowledge products;
- Project operational guidelines, manuals and systems;
- Minutes of the Project Steering Committee meetings.

B) Interviews with:

- UNDP-GEF staff who have project responsibilities;
- Staff of the Project Coordination Unit;
- Executing agencies;
- Members of the Project Steering Committee;
- Project stakeholders, particularly members of the various project level steering committees and project beneficiaries;

C) Field Visits:

The following project sites should be visited: refrigerators dismantling facility.

ANNEX 2

ETHICS DRAFT TEXT

The GEF Monitoring and Evaluation Principles

In accordance with the monitoring and evaluation policy of the GEF and UNDP, this evaluation is guided by, and has applied, the following principles:

Independence: The Evaluator is independent and has not been engaged in the Project activities, nor was he responsible in the past for the design, implementation or supervision of the project.

Impartiality: The Evaluator endeavoured to provide a comprehensive and balanced presentation of strengths and weaknesses of the project. The evaluation process has been impartial in all stages and taken into account all the views received from stakeholders.

Transparency: The Evaluator conveyed in as open a manner as possible the purpose of the evaluation, the criteria applied and the intended use of the findings. This evaluation report aims to provide transparent information on its sources, methodologies and approach.

Disclosure: This report serves as a mechanism through which the findings and lessons identified in the evaluation are disseminated to policymakers, operational staff, beneficiaries, the general public and other stakeholders.

Ethical: The Evaluator has respected the right of institutions and individuals to provide information in confidence and the sources of specific information and opinions in this report are not disclosed except where necessary and then only after confirmation with the person consulted.

Competencies and Capacities: The credentials of the Evaluator in terms of his expertise, seniority and experience as required by the terms of reference.

Credibility: This evaluation has been based on data and observations which are considered reliable and dependable with reference to the quality of instruments and procedures and analysis used to collect and interpret information.

Utility: The Evaluator strived to be as well-informed as possible and this ensuing report is considered as relevant, timely and as concise as possible. In an attempt to be of maximum benefit to stakeholders, the report presents in a complete and balanced way the evidence, findings and issues, conclusions and recommendations.

ANNEX 3

RATINGS GUIDELINES FOR GEF PROJECT PROGRESS

1. Progress toward achieving project objectives

Rating of Project Progress towards Meeting Objective: Taking into account the cumulative level of progress compared to the target level across all of the objective indicators, please rate the progress of the project towards meeting its objective, according to the following scale.

Highly Satisfactory (HS)	Project is expected to achieve or exceed all its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as “good practice”.
Satisfactory (S)	Project is expected to achieve most of its major global environmental objectives, and yield satisfactory global environmental benefits, with only minor shortcomings.
Moderately Satisfactory (MS)	Project is expected to achieve most of its major relevant objectives but with either significant shortcomings or modest overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environment benefits.
Moderately Unsatisfactory (MU)	Project is expected to achieve of its major global environmental objectives with major shortcomings or is expected to achieve only some of its major global environmental objectives.
Unsatisfactory (U)	Project is expected not to achieve most of its major global environment objectives or to yield any satisfactory global environmental benefits.
Highly Unsatisfactory (HU)	The project has failed to achieve, and is not expected to achieve, any of its major global environment objectives with no worthwhile benefits.

2. Progress in project implementation

Highly Satisfactory (HS)	Implementation of all components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as “good practice”.
Satisfactory (S)	Implementation of most components is in substantial compliance with the original/formally revised plan except for only a few that are subject to remedial action.
Moderately Satisfactory (MS)	Implementation of some components is in substantial compliance with the original/formally revised plan with some components requiring remedial action.
Moderately Unsatisfactory (MU)	Implementation of some components is not in substantial compliance with the original/formally revised plan with most

	components requiring remedial action.
Unsatisfactory (U)	Implementation of most components is not in substantial compliance with the original/formally revised plan.
Highly Unsatisfactory (HU)	Implementation of none of the components is in substantial compliance with the original/formally revised plan.

ANNEX 2

SCHEDULE FOR MEETINGS AND VISITS ON MID-TERM EVALUATION BY DR. LARI

Activity	Venue	Time
<i>Monday 27th May, 2013</i>		
Kick-off Meeting at UNDP	UNDP CO HQ	3:00pm
<i>Tuesday 28th May, 2013</i>		
Meeting Project Team and Energy Commission Officials	Energy Commission HQ, Airport Residential, Accra	10:00am
Lunch		12:00 noon
Visit one participating shop	Appliance Master's HQ	1:30 pm
Visit Refrigerator Dismantling Facility	CWMCL HQ	3:00 pm
<i>Wednesday 29th May, 2013</i>		
<i>Steering Committee Meeting(Oak Plaza Hotel)</i>		
<i>Time</i>	<i>Activity</i>	<i>Responsible Party</i>
9:00a.m	Registration	All Participants
9:30a.m. – 9:35a.m.	Welcome/Introduction	Chairman
9:35a.m. – 10:00a.m.	Update on Project Activities	Project Coordinator
10:00a.m. – 10:05a.m.	Introduction of Consultant	UNDP
10:05a.m. – 10:30a.m	Overview of Mid-Term Evaluation	Dr. AdilLari
10:30a.m. – 11:00a.m.	Coffee Break	
11.00a.m. – 11.15p.m.	Responses to Circulated Interview Questions	All
11.15a.m. – 1.15p.m	One on One Interviews (15minutes per interview)	

- Mr. Solomon Quaye, NARWOA
- Nana Ernest Asare, Energy Foundation
- Dr. Ferdinand Tay, Consumer Association of Ghana
- Dr. Raymond Babanawo, Ministry of Environment, Science, Technology and Innovation
- Mr. K. Ntim Donkoh, Ministry of Trade and Industry
- Mr. Emmanuel Quansah, Environmental Protection Agency
- Mr. E.A. Osei-Kwabena, Ghana Standards Authority
- Mr. Seidu Adams, Ministry of Finance and Economic Planning

1.15pm – 1.30p.m Wrap Up and Closing

1:30p.m. – LUNCH

Visit to Ecobank East Airport Branch 2:30pm

Shop Visitation – Melcom Limited Spintex Branch 3:00pm

Thursday 30th May, 2013

Activity	Venue	Time
Visit Agbobloshie Refrigerator Scrapping site	Agbobloshie	9:30 am
Visit Somovision retail outlet and meet with	Somovision HQ, NIA	11:30am
Lunch		12:30pm noon
Meeting with participating bank	ECOBANK	2:30pm
Meeting with City Waste Management Limited	Alisa Hotel	3.00pm

Friday 31st May, 2013

Debriefing Meeting at UNDP UNDPCO HQ 11:00am

Annex 3: List of Persons Interviewed

UNDP CO Ghana

- Jeremias Blaser: UNDP Ghana Deputy Country Director for Programme.
- Joseph Appiah-Gyapong: Head of the Sustainable Development Cluster, UNDP Ghana.
- Louis Kuukpen: M&E Specialist at UNDP Ghana.
- Paolo Dalla Stella, focal point at UNDP Ghana.
- Benoît Lebot, Environment & Energy Group Practice Leader, UNDP Regional Center, Dakar (Telephone interview)

Energy Commission

- Kofi Agyarko: Head of Office of Energy Efficiency Promotion at the Energy Commission.
 - Eric Antwi-Agyei: Project Coordinator
 - Anita Adjei: Project Administrative and Financial Assistant.
-
- Mr. Solomon Quaye, NARWOA
 - Nana Ernest Asare, Energy Foundation
 - Dr. Ferdinand Tay, Consumer Association of Ghana
 - Dr. Raymond Babanawo, Ministry of Environment, Science, Technology and Innovation
 - Mr. K. NtimDonkoh, Ministry of Trade and Industry
 - Mr. Emmanuel Quansah, Environmental Protection Agency
 - Mr. E.A. Osei-Kwabena, Ghana Standards Authority
 - Mr. Seidu Adams, Ministry of Finance and Economic Planning
 - Mr. Carl Asem, Ecobank
 - Mr. Evans Appiah, Melcom Limited Spintex Branch
 - Mr. Jürgen Meinel, City Waste Management Limited
 - Mr. Mohammed Ali, Agbogbloshie Refrigerator Scrapping site
 - Mr. S. Chandramouli, SomovisionLimited
 - Mr. Randy Sey, Appliance Masters (Tradeworks Company Limited)

Annex 4: LIST OF DOCUMENTS REVIEWED

- PROJECT DOCUMENT
- REQUEST FOR CEO ENDORSEMENT/APPROVAL
- REQUEST FOR PROJECT PREPARATION GRANT (PPG)
- PROJECT IDENTIFICATION FORM (PIF)
- REPORT ON LOCAL PROJECT APPROVAL
- INCEPTION REPORT
- PRESENTATIONS AT INCEPTION MEETING
- MINUTES OF FIRST STEERING COMMITTEE MEETING
- PROJECT IMPLEMENTATION REVIEW 2012
- ANNUAL BUDGET FOR 2012
- WORKPLAN FOR 2012
- COMPILED QUARTERLY REPORTS FOR 2011/2012
- LI 1958 – REFRIGERATING APPLIANCES STANDARDS REGULATION
- ANNUAL WORKPLAN 2013
- ANNUAL BUDGET FOR 2013
- ACTION PLAN ON CARBON FINANCING FOR THE PROJECT – STUDY REPORT
- QUICK DESK REVIEW AS PART OF THE STUDY REPORT ON CARBON FINANCING
- Audit report for 2012 (PWC)

ANNEX 5

General Interview Outline

The Mid-Term Evaluation is a planned part of GEF-funded projects. The objective of the Mid-Term Evaluation is to measure the effectiveness and efficiency of project activities in relationship to the overall project objective, and to make recommendations which could improve the project or help plan similar projects.

The Mid-Term Evaluation (MTE) of the Project 'Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana' has been initiated by UNDP Ghana in order to assess the overall project progress, make sure the project is on track to deliver the agreed outcomes, and to produce recommendations on any adjustments needed. Findings of the MTE will be incorporated as recommendations for enhanced implementation during the remainder of the project's term.

1. Please give your name, your role in the project and a short description of your responsibilities with reference to the project.
2. In your opinion, what is the most significant accomplishment of the project? Which project actions were most effective in terms of meeting energy saving and environmental targets? Which are less effective?
3. Were national stakeholders (government, SMEs, building owners, financial institutions, etc.) accepting and actively participating in the project? Were stakeholders well informed of project progress? Did the stakeholders have an adequate role in project decision-making?
4. Have there been clear indications of increased energy efficiency and/or environmental consciousness as a result of the project? Has public awareness on climate change, energy efficiency and environmental issues increased as a result of the project?
5. Is the project creating long-term, sustainable benefits for Ghana? What project-created measures or actions (legislation, institutions, web-sites, etc.) provide most significant benefits?
6. Is there adequate coordination between this project and other interventions in the energy/environment sector? Is duplication of effort being avoided?
7. Has the project encountered problems in its implementation? If so, is adaptive management being efficiently applied to meet these challenges?
8. Which lessons and good practice have emerged from the project? Are these relevant for similar projects outside of Ghana?
9. What strategy would you recommend to ensure a sustainable role of the project in Ghana?
10. Do you have any further comments or suggestions?



**Mid-Term Evaluation
of the UNDP–GEF Project**

**Promoting of Appliance of Energy Efficiency and
Transformation of the Refrigerating Appliances Market
in Ghana**

Accra, Ghana

May 2013

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INTRODUCTION

Dr. Adil Lari :

- Practicing Architect and Managing Director of the Austrian Consulting Engineers Group **ACE Group**
- Over 25 years experience planning and realizing low-energy buildings and in Europe and abroad.
- International expert for buildings sector energy efficiency and renewable energy policy development in Europe, CIS and the Near East

ACE Group Mission Statement:

Energy efficient and renewable energy measures for buildings should be cost effective and accessible. They should pay for themselves in a short time and provide long-term comfort and savings.



EVALUATION OBJECTIVES

The Mid-Term Evaluation (MTE) is initiated by the UNDP Country Office in Ghana in order to assess the overall project progress, make sure the project is on track to deliver the agreed outcomes and to produce recommendations on any adjustments needed.

The main objectives of the MTE are to:

- Determine progress being made towards the **achievement of outcomes**;
- focus on the **effectiveness, efficiency and timeliness** of project implementation;
- highlight **issues requiring decisions** and actions;
- present **lessons learnt** and best practices about project design, implementation and management, and state how they can be applied to future and other on-going projects;
- examine the **performance** of the project since the beginning of its implementation as measured against planned **outputs** set forth in the Project Document in accordance with rational **budget** allocation and the assessment of features related to the process involved in achieving those outputs, as well as the initial and potential impacts of the project;
- address underlying causes and issues contributing to targets not adequately achieved;
- identify weaknesses and strengths of the **project design**;
- recommend any **necessary changes** in the overall design and orientation of the project by evaluating the adequacy, efficiency, and effectiveness of its implementation, as well as assessing the project outputs and outcomes to date;
- assess if there is evidence that **sustainability** of benefits is being built into the project (institutional and financial capacity)
- provide detailed **recommendations** on the work plan for the remaining project period and to assess early signs of the project success or failure, and prompt any necessary adjustments.

PROJECT GOAL, OBJECTIVE AND OUTCOMES

Strategy	Indicators	Baseline (Year 0)	Target	Sources of Verification	Risks and Assumptions
<p>GOAL: To reduce Ghana's energy-related CO₂ and ozone depleting substance (ODS) emissions</p>	<ul style="list-style-type: none"> • Cumulative amount of GHG reduced in kilotons of CO₂ 	<ul style="list-style-type: none"> • None 	<p>CO₂ reduction- 251.6 kilotons comprising:</p> <ul style="list-style-type: none"> - 129.6 kilotons CO₂ abated from energy savings - 122.0 kilotons CO₂ abated from chlorofluorocarbon CFCs (ODS) removal 	<ul style="list-style-type: none"> • Project implementation reports • GHG inventories and reports to UNFCCC 	<ul style="list-style-type: none"> • The policy/ institutional/ regulatory framework in Ghana is fully supportive of the project objectives
<p>PROJECT OBJECTIVE: To improve the energy efficiency of refrigeration appliances in Ghana through the introduction of energy efficiency standards, and demonstration of equipment turn-in and replacement program</p>	<ul style="list-style-type: none"> • Reduced consumption of electricity by households, institutions and commercial firms for refrigeration • Tons of CO₂ emissions reduction 	<ul style="list-style-type: none"> • Large number of refrigeration appliances with poor energy efficiency and ozone depleting substances in Ghana 	<ul style="list-style-type: none"> • Purchase of 50,000 energy efficient refrigeration appliances by year 3 of project implementation • Energy savings – 216,000 MWh • CO₂ reduction- 251.6 kilotons 	<ul style="list-style-type: none"> • Refrigeration appliances imports / retailers survey • Project implementation reports 	<ul style="list-style-type: none"> • The policy/ institutional/ regulatory framework in Ghana is fully supportive of the project objectives • Strong involvement for project from retailers and consumers of refrigeration appliances • Project is implemented as per plan



PROJECT GOAL, OBJECTIVE AND OUTCOMES

8 Outcomes

1. Structures and mechanisms for implementation of appliance **energy efficiency standards and labels (S&L)** strengthened
2. National testing **certification**, labeling and enforcement mechanisms adopted
3. Increased consumer's and retailer's **awareness** and improved **marketing** of appliance energy efficiency standards and labels
4. Establishment of refrigerating appliance **test facilities**
5. Establishment of used appliance and ODS **collection and disposal facilities**
6. Development of efficiency program **evaluation and monitoring** capacity
7. Conduct of refrigeration appliance **rebate and exchange program** throughout Ghana that distribute at least 50,000 efficient appliances
8. Development of various feasible finance models for **national scale** follow-up of pilot rebate and exchange program



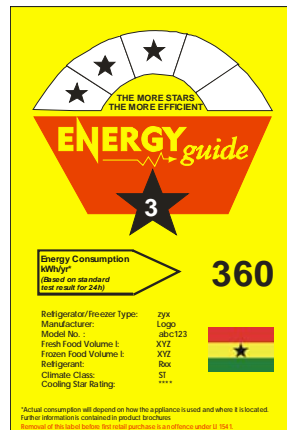
PROJECT GOAL, OBJECTIVE AND OUTCOMES

OUTCOME 1: Structures and mechanisms for implementation of appliance **energy efficiency standards and labels (S&L)** strengthened

- Introduction of regulatory framework on minimum performance standards for refrigerating appliance through LI 1958

- Ban on importation of used refrigerators. LI 1932

OUTCOME 2: National testing **certification**, labeling and enforcement mechanisms adopted





PROJECT GOAL, OBJECTIVE AND OUTCOMES

OUTCOME 3: Increased consumer's and retailer's **awareness** and improved **marketing** of appliance energy efficiency standards and labels

• **training workshops** for refrigerator technicians

• **radio** Jingles and Interviews

• **TV**

- **documentary** and interviews
- **popular sitcom**
- **animation**

• **billboards**

• **website** www.energyguide.org.gh



OUTCOME 4: Establishment of refrigerating appliance **test facilities**



PROJECT GOAL, OBJECTIVE AND OUTCOMES

OUTCOME 5: Establishment of used appliance and ODS **collection and disposal facilities**

City Waste Management Company

- Collect turned-in refrigerators from Participating shops as part of the rebate
- Test refrigerators prior to collection
- Provide adequate storage and security for refrigerators
- Dismantle refrigerator and recover refrigerants
- Provide all equipment necessary to carry out task

Degassing Facility operating since January 2013

OUTCOME 6: Development of efficiency program **evaluation and monitoring** capacity





PROJECT GOAL, OBJECTIVE AND OUTCOMES

OUTCOME 7: Conduct of refrigeration appliance
rebate and exchange program throughout Ghana
that distribute at least 50,000 efficient appliances

Launched: Sept 2012
1200 appliances exchanged by Feb. 2013



OUTCOME 8: Development of various feasible
finance models for **national scale** follow-up of pilot
rebate and exchange program



NEXT STEPS

- National scale exchange programme
- Refrigerator testing and certification
- Further publicity campaigns
- Evaluate environmental impact
- Continued stakeholder involvement



NEXT STEPS

National scale exchange programme

- Limited budget for rebate program
 - End users need financial incentive
 - target has been reduced from 50 000 to 15 000
 - Payback period must be accountable
 - Electricity is subsidized

Recommendations

- Revolving fund with cooperation of banks
- Distribute points of sale throughout Ghana



NEXT STEPS

Refrigerator testing and certification

- Budget and schedule limitations
- Consumers are already looking for labels

Recommendation

- Have manufacturers certify appliances at recognized international testing facilities
 - Ministry of Trade should give list of 8-10 international accredited test facilities
- Target EE labels for all appliances



NEXT STEPS

Publicity campaigns

- Effective but requires additional funding

Recommendations

- Clearly target end consumers
- Seek in-kind support from sponsors
 - Radio/television stations can donate air time
 - Appliance makers, wholesalers and retailers
- Campaigns should be accountable
 - Survey of sales based on campaign



NEXT STEPS

Evaluate environmental impact

- Target for rebate programme has been reduce from 50 000 to 15 000 units
 - CO₂ emission reductions reduced by 2/3
- Foam insulation as waste by-product

Recommendations

- Introduce national-scale financing model
- Check carbon financing / energy contracting as model to sustain project momentum



RECOMMENDATIONS

- Revolving fund with cooperation of banks
- Distribute points of sale throughout Ghana
- Have manufacturers certify appliances at recognized international testing facilities
- Target EE labels for all appliances
- Clearly target end consumers in the publicity campaign
- Seek in-kind support from sponsors
- Introduce national-scale financing model
- Check carbon financing / energy contracting as model to sustain project momentum



Good Practice

1. **Minister President's projects are given priority :**
2. **Energy Commission has proven track record with EE lighting programme**
3. **Familiarity with the local situation as the basis for application of internationally proven approaches.**
4. **Success through the promotion and support for a select few effective and proven measures**
5. **Good co-operation between UNDP and Energy Commission.**

Mid-Term Evaluation of 'Promoting of Appliance of Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana'

Annex 7 - Impact Study for Potential Refrigerating Appliance Purchase by Installment Plan
prepared by Dr. Adil Lari, project evaluator

Cost of electricity for consumer	0,18 Cedi/kWh
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Costs of appliance purchase and operation	used refrigerator	new refrigerating appliance				
		1-star	2-star	3-star	4-star	5-star
cost of refrigerator (cedi)	300	730	870	1172	1319	1103 ? confirm
electricity required (kWh/yr)	1146	614	511	375	286	205
cost of electricity (cedi/year)	206,28	110,52	91,98	67,50	51,48	36,90
total cost for consumer after 2 years (cedi)	713	951	1054	1307	1422	1177
total cost for consumer after 5 years (cedi)	1331	1283	1330	1510	1576	1288
total cost for consumer after 8 years (cedi)	1950	1614	1606	1712	1731	1398

Purchase over 2 Year Installment Plan	1-star	2-star	3-star	4-star	5-star
40% down payment (cedi)	292	348	469	528	441
60% loan to be paid back over 2 years (cedi)	438	522	703	791	662
divided into 24 monthly payments (cedi/month)	18,25	21,75	29,30	32,98	27,58
less consumer's monthly electricity bill savings (cedi/month)	-7,98	-9,53	-11,57	-12,90	-14,12
actual cost for consumer over 24 months (cedi/month)	10,27	12,23	17,74	20,08	13,46

Energy and GHG savings per appliance over 14 year product life	1-star	2-star	3-star	4-star	5-star
MWh savings - demand side	7,448	8,890	10,794	12,040	13,174
MWh savings - supply side (20% P&D losses)	9,310	11,113	13,493	15,050	16,468
tCO ₂ savings /refrigerator & 14 yr. lifecycle	5,26	6,28	7,63	8,51	9,31

Involvement of Project Funding	Total	1-star	2-star	3-star	4-star	5-star
Potential funding	2.000.000					
Distribution (approx)	100%	20%	20%	20%	20%	20%
12% interest on loan covered by fund (cedi/appliance)		52,56	62,64	84,38	94,97	79,42
number of appliance purchases leveraged	27985	7610	6386	4740	4212	5037
potential tCO ₂ savings counted towards project	199079	40060	40121	36162	35841	46896

Annex 8: Evaluator's Response to Draft Evaluation Comments

Comments from the UNDP CO

Comment 1.

Location in Document: Section 1. Executive Summary; Recommendations

Statement: 3 .National Scale Exchange Program. The refrigerating appliance turn-in and rebate program should go national before project end to include more brands, more dealers and a broader regional base.

Comment: The national scale-up commenced on 15th May.

Response: The term 'go national' has been removed here and in the recommendations under section 5. The recommendation that the program include more brands, more dealers and a broader regional base remains.

Comment 2.

Location in Document: Section 1. Executive Summary; Recommendations

Statement: Publicity Campaigns. Financing of the campaigns requires considerable budget and it is recommended that the project seek in-kind support from sponsors

Comment: Do you mean participating shops?

Response: for example, radio and t.v. broadcasters, utilities, appliance manufacturers, wholesalers and dealers.

Comment 3.

Location in Document: 4. Findings and Conclusions/ 4.1 Conceptualization/Design /Project formulation

Statement: Alone through utility costs savings, these new energy efficient refrigerating appliances can typically recover the investment above the cost of used inefficient appliances after about 5 years.

Comment: Based on our calculation this could be 2 years.

Response: Based on the current new appliance prices and electricity consumption data as well as electricity tariffs supplied by the project team, the evaluator has prepared a preliminary Impact Study for Potential Refrigerating Appliance Purchase by Installment Plan (Annex 7). In this study, the accumulated costs of refrigerator appliance purchase and electricity consumption are

compared for a used appliance and for 1-star, 2-star, 3-star, 4-star and 5-star models after 2 years, 5 years and 8 years. After 5 years, the combined purchase and electricity costs of the 1-star, 2-star and 5-star models were less than those of a used refrigerator. For the 3-star and 4 star models, the payback period (compared to the purchase of an inefficient used refrigerator) was between 6 and 7 years. From the data supplied it was not clear whether the models compared were of similar size, volume and quality. For the purposes of this evaluation and as a basis for its recommendations, the evaluator has maintained a potential payback period of 5 years based on data made available to him.

Comment 4.

Location in Document: 4.2 Project Implementation/ Implementation Approach/ Use of the Logical Framework as a Management Tool

Statement: At the Steering Committee meeting in January 2012, the target of 50,000 replacement refrigerators within the refrigerating appliance replacement program was discussed as untenable considering limited funding available and that the rebate sums as originally planned provide inadequate consumer incentive to exchange appliances. Subsequently, it was decided to reduce the target to 15,000 which would deliver only 30% of the CO2 emission reductions targeted by the project.

Comment: The reasons for this decision should be better explained. The amount committed by the government (3 million Ghana Cedis) has remained the same, but due to inflation and depreciation of the Ghana cedis, the amounts for the rebate set in the project document are nowadays not attractive and there was the need to increase them.

Response: Requested explanation added to report.

Comment 5.

Location in Document: 4.2 Project Implementation/ Implementation Approach/ Use of the Logical Framework as a Management Tool

Statement: The refrigerating appliance exchange program began in September 2012. After 8 months, only 2200 units had been purchased under the exchange program and the used appliances delivered to recycling centers.

Comment: It should be explained that the rebate scheme has started on a pilot basis in Accra and Tema.

Response: Comment has been added to report. The fact that the scheme has been started at the national level on May15, 2013 has also been added.

Comment 6.

Location in Document: 4.2 Project Implementation/ Implementation Approach/ Use of the Logical Framework as a Management Tool

Statement: Generally, there is a weakness in the progress tracking activities undertaken to verify project impact.

Comment: We could talk about challenges rather than weakness.

We have data on each customer on the scheme which includes a geocode from the bill. This is used to generate a location for the customers from the scheme. With the geocode we have also been able to request for consumption pattern for these customers over a year. However, due to the power outages this mode of analysis has not yielded any logical trend.

We also provide questionnaires to customers to provide us with feedback on the scheme and their knowledge of S&L.

We also maintain a hotline where we receive enquiries from individuals on the scheme.

Our extensive database on customers who participate in the scheme allow us to contact them on any issue.

One challenge has been early reporting from the participating retailers. For instance we have tied payment to reporting however one of the companies involved in the rebate submitted its first report after 3 months of the rebate start.

Response: In the project document, the CO₂ emission reduction target (251 thousand tCO_{2e} by the end of year 3) is directly linked to the purchase of 50,000 new energy efficient refrigerating appliances and the decommissioning of 50,000 used inefficient refrigerators in the refrigerator rebate and exchange program. When the rebate and exchange program target was reduced from 50,000 to 15,000 units in January 2012, there seems to have been no measure or activity proposed or pursued by the management team which could compensate the project for lost CO₂ emission reductions.

Based on the on CO₂ emissions reduction data supplied by the project team, of the 251,6 thousand tCO₂ emission reductions targeted for the end of the project in June 2014, only 4.4% (11 thousand tCO_{2e}) have been accounted for by the exchange of 2200 used refrigerating units with energy efficient models in the pilot rebate and exchange program by the end of May 2013.

The project is making sustainable impact through the media campaign, through legislation and training and through competent management of activities and finances, but the tracking of project performance in relation to targets set out in the logical framework (especially CO₂ emission reductions targets) is currently weak. Activities related to monitoring the impact of the project have focused on the rebate and exchange program (which from project inception was not expected to reach the targets stated.) Further, the development of a national energy and GHG

impact monitoring competence under Outcome 6 has been delayed to the project's final year. Had it been available earlier in the implementation as planned, this competence could provide reliable data on project progress against GHG emission reductions targets and support adaptive management.

Comment 7.

Location in Document: 4.2 Project Implementation/ Implementation Approach/ Application of Adaptive Management

Statement: Up to the project mid-term, adaptive management has not been adequately applied to address project shortcomings in terms of progress towards meeting global targets.

Comment: please elaborate on this aspect.

Response: See response to Comment 6 above

Comment 8.

Location in Document: 4.2 Project Implementation/ Implementation Approach/ Monitoring and evaluation

Statement: Quarterly project reviews have been issued but are too concise and do not adequately address overall project progress towards meeting expected outcomes and targets.

Comment: It is a GEF reporting requirement to have concise QPR (150 words).

Response: The evaluator is not aware of QPR restrictions but considering the Project Document does indicate that Quarterly Progress Reports should be short, 'too concise' has been removed.

Comment 9.

Location in Document: 4.2 Project Implementation/ Implementation Approach/ Monitoring and evaluation

Statement: Project activities (specifically outcome 6 and output 7.5) which are designed to strengthen national capacities for monitoring GHG emission reductions seem to have been neglected in the project implementation.

Comment: Outcome 6 is considered as a very important component of the project and its actual implementation is taking place during the rest of the project period. UNDP is currently recruiting an international consultant to:

- Develop an impact evaluation methodology
- Train local professionals to carry out the impact evaluation even after the project has been completed
- Field test the impact evaluation methodology.

The Energy Commission is also planning to procure the needed metering equipment.

Response: The project schedule in the Project Document has Outcome 6 beginning in year 1. The contracting of qualified local professionals under Output 6.3 and the acquisition of metering equipment under Output 6.2 should have been completed by the middle of year 2. 'Neglected' has been changed to 'delayed.'

Comment 10.

Location in Document: 4.3 Results/ Attainment of Outcomes/Achievement of Objectives / Output 5.4: ODS Disposal Centre designed and implemented

Statement: 11.940Kg of R134a refrigerant had been collected by the end of the first quarter 2013. On the average 70g of refrigerant is collected from each refrigerator/freezer. CWMC submits weekly collection reports and reports on the dismantling process.

Comment: EPA's role should be explained, since this is the outcome where the GEF project is interlinked with the Montreal Protocol project

Response: City Waste Management Company (CWMC) hands over the recovered refrigerants to the Environmental Protection Agency (EPA) who organizes the ODS destruction abroad. The revenue generated from the ODS destruction is split between the Energy Commission, the EPA and CWMC.

Comment 11.

Location in Document: 4.3 Results/ Attainment of Outcomes/Achievement of Objectives / Output 5.4: ODS Disposal Centre designed and implemented

Statement: City Waste Management Company has been collecting refrigerators from the rebate scheme since September 2012.

Comment: The partnership between the EC, EPA and CWMC should be recognized as a very good arrangement. CWMC has an interest in obtaining working refrigerators since they have a share in CFC destruction revenue. This therefore limits the high potential for retailers to accept non-functional refrigerators or present their own stock of non-functional refrigerators.

Also, the project avoided the expenditure of over USD 250,000 in establishing this facility. Since we held a competitive process to select CWMCL, the company made an offer that it would rather invest in a facility and share in the revenue of CFC12 destruction and in addition retain the scraps. The company is also responsible for all cost involved in logistics for checking refrigerators at participating shops and transporting them to their site. This cost would have been the responsibility of the project has also been avoided.

This should be highlighted as a major aspect in "efficiency" in resource utilization.

This arrangement should also be seen as a lesson for replication in other projects.

Response: Comment have been incorporated under 4.2 Project Implementation / Procurement Management and section 6. Lessons Learned (point 6.)

Comment 12.

Location in Document: Executive Summary

Comment: Just one point on the Overall Rating: on page 5, you give “moderately satisfactory”, while on page 6 (in the table) you give “satisfactory”. Please clarify which is the correct one.

Response: Both are correct. On page 5 the rating of ‘moderately satisfactory’ pertains to the project performance and progress towards achieving expected impact, while the overall rating at the end of the table on Page 6, is the average of my ratings of the project from design to results.

My rating of the project performance is based on whether the project is well on the way to reach the overall target of 251,6 thousand tCO₂ emission reductions by project end (from the Project Document and CEO Endorsement.)

As I mentioned in the report;

- In the project document, the CO₂ ER target is directly linked to the purchase (and exchange) of 50 000 units. When the purchase target was reduced to 15 000 units in January 2012, there seems to have been no measure or activity proposed or pursued by the team which would compensate for the lost CO₂ emission reductions.
- Based on the information from the project team on CO₂ abated by the project, from the 251,6 thousand tCO₂ ER targeted for the end of year 3, only 4.4% (11 thousand tCO₂) have been documented as achieved by the end of year 2.

On the whole, the project team has shown competence and good judgment in implementing the project activities. I hope I have made that clear in the report. My criticism in the evaluation report under the headings ‘use of the logframe as a management tool’, ‘adaptive management’ and ‘monitoring and evaluation’ is based on perceived gaps in the monitoring of accountable CO₂ emission reductions (in relation to the 251,6 thousand tCO₂ target) and in the use of this monitoring data to ‘adapt’ project activities to better meet this target.

There’s good potential to reach the target, but the team needs to 1) monitor the project’s impact nationwide and beyond the exchange program in different stores, at wholesalers, etc. and 2) target more consumers with more sales points, with attractive loan programs, with installment programs advertised on the electricity bills, etc.