OUTLINE

DEA

NATIONAL BACKGROUND PAPER

Zambia

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September 2005

INTRODUCTION

PURPOSE

This paper shows highlights on the energy situation in Zambia. It also gives premises for the introduction of the project titled "Development and Energy in Africa" DEA. A brief description of selected case studies is used to show linkages between energy and development.

INTRODUCTION TO DEA

DEA stands for Development and Energy in Africa**.** The DEA aims at developing an operational tool (an assessment framework) that facilitates improved design of energy interventions. A catalogue will be made of energy interventions in 6 African countries. This assessment framework will be used to better the performance or enhance achievements of project objectives, for future energy interventions. An energy intervention in this case, is any policy measure that affects energy demand and/or supply in a country. This can be a project, a policy or an innovation. An innovation can be either technological or institutional.

INTRODUCTION TO DEA PARTNER

CEEEZ is a non-governmental organization, which is independent and non-profit making in its activities. Established in 1993 under the registrar of Companies act (limited by guarantee), its major activities involve collaborating with Government and various institutions in the country and overseas in the fields of energy, environment and engineering. The specific role of CEEEZ is to investigate, analyze and make useful conclusions and policy recommendations on energy, environment and engineering concerns. In addition, CEEEZ carries out studies, research and development, consultancy and training in the areas of energy, environment and engineering.

Energy is a vital input in economic development. Production and use of energy often leads to environmental degradation. In many cases government, energy producers and industrialists are not aware of sound energy and environment management. In addition, they often lack technical expertise to derive sound policy analysis which is necessary to support relevant practices. There is need, therefore, to have independent research institutions that can cooperate with government and industrialists in finding means of ensuring harmony between economic development and the protection of the environment. CEEEZ works to fill this gap.

CEEEZ has been involved in a number of consultancies on energy and environment issues among them being the Zambia Country Study on Climate Change a greenhouse gas emission study supported by Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) and other studies supported by DANIDA, SIDA, World Bank, UNIDO and the EU.

COUNTRY ENERGY STATUS

Population	9,770,199 (2001)
Population Growth	1.63% (average, 1997-2001)
Land Area	752,610 sq km average)
Currency	3,611 / 1 kwacha / $US (2001 - average)
GDP - PPP Method	$6,919 (millions of 1995 dollars U.S.)
GDP Growth -	1.63% (average, 1997-2001); -8.40% (2001)
GDP Per Head	$708 (2001 data estimated in 1995 dollars U.S.)
Inflation	27.20% (average, 1997-2001); 18.00% (2001

Inflation rate (consumer prices): 18.3% (2004 est.)

Household income or consumption by percentage share:

Lowest 10%: 1.1%

Highest 10%: 41% (1998)

Labour force: 4.63 million (2004 est.)

Labour force - by occupation: agriculture 85%, industry 6%, services 9%

Unemployment rate: 50% (2000 est.)

Electricity - production: 8.167 billion kWh (2002)

Electricity - production by source:

Fossil fuel: 0.5%

hydro: 99.5%

nuclear: 0%

other: 0% (2001)

Zambia's energy situation is reasonably balanced. While Zambia is a net oil importer, importing more 12,000 barrels per day, it is also a net exporter of hydroelectricity. Domestic energy resources include coal and hydroelectric power. In the electricity sector, Zambia has an installed capacity of 2,436 MW of which 2,245 MW is hydroelectric and 191 MW is thermal. Zambia has been producing an average of 8.167 billion kWh (2002) per year while the consumption is around 5.345 billion kWh (2002). The exports stand at 2.25 billion kWh (2002) with no exports.

In order to speed up its rural electrification program, which has been slowed by the high costs of grid extension services, Zambia had developed a program of electrification by solar energy, through ESCOs. Zambia is also studying the use of locally produced ethanol (from sugar cane) as an alternative transport fuel. The ethanol would be blended with gasoline to create a cleaner fuel. The fuel would

reduce harmful emissions and save foreign exchange for the country.

The World Bank is currently involved in the development of several renewable energy projects in the SADC. Two projects, the Zambia Power Rehabilitation Project and Zimbabwe Energy Project, will utilize solar photovoltaic technology.

CHALLENGES IN RELATION TO POVERTY REDUCTION

- Lack of economic growth: as a resulted there has been little increase in domestic resources either through savings or tax revenues. Despite the comprehensive macroeconomic reforms that have been implemented in Zambia in the past ten years, there has not been any significant growth in the economy
- High inequality, which is more than 0.5. Rural-urban, inter-provincial and inter-social strata disparities are evident. The main reason why inequality tends to beget more inequality is the unequal access to credit. The poor cannot easily access credit, owing to little or no wealth to provide as collateral and hence continue to languish in near- or below-subsistence state. The rich, on the other hand, have easy access to credit and hence are able to build up further on their already substantial wealth.
- More than 70% of the people in Zambia are poor, the majority living in rural areas. 57% are extremely poor.
- 83% of the poor live in rural areas
- Zambia has had a debt burden with servicing accounting for up to 10% of GDP
- Excessive external dependence: paradoxically, funds from international cooperating partners would be forthcoming only if the country is current on debt servicing. As a result, nearly half the inflow of external assistance has tended to flow out again in the form of debt service payments. It is also a requirement that donors and the Zambian Government be congruent in their views on economic and political governance.
- Even within the limited resources, poverty reduction may not get its due share with wrong prioritization, misdirection of resources, and lack of transparency in their utilization. For instance, to date Zambia has severely fallen short of fulfilling the benchmarks for allocation to areas of priority human concerns prescribed by the Human Development Ratio and the 20:20 Initiative.
- Biomass energy and physical energy will remain critical energy sources for many years.
- About 44% of the wood consumed is used for Charcoal

ENERGY POLICY AND IMPLEMENTATION

PRSP

Apart from being a critical input in many sectors, energy is an industry in its own right with the capacity of earning foreign exchange and employing many people; these employment figures currently stand at 6,000 and 60,000 respectively for electricity and charcoal.

In 1994, the Zambian Government formulated a National Energy Policy (NEP). Its main objective is .to promote optimum supply and utilization of energy, especially

indigenous forms, to facilitate the socio-economic development of the country and maintenance of a safe and healthy environment.. Zambia has been in the process of making a Poverty Reduction Strategy Paper (PRSP) from 2000 to 2001.Broadly, the policies in the energy sub-sectors are defined as follows:

- *Electricity:* Increase accessibility in its use as well as develop the most cost-effective generating sites for domestic and export markets.
- *Petroleum:* Supply and utilize petroleum in the most efficient and cost-effective manner.
- *Coal:* Promote its use with due regard to environmental protection.
- *Wood fuel:* Promote efficient production and utilization of wood fuel.
- *New and Renewable Sources of Energy (NRSE):* Promote wider application of proven NRSE technologies in meeting the energy needs particularly for remote areas.

Programmes in the energy sector to contribute to poverty reduction will aim at the following:

- Increasing the electricity access rate from the current 20 percent to 35 percent by the year 2010. In rural and urban areas, this will translate to access rates of 15 percent and 50 percent respectively. Increased access to electricity will enhance social and economic development by supporting agricultural activities such as irrigation and food processing, land preservation, etc.
- Reducing the production of charcoal by about 400,000 tonnes by 2010. To do this, the PRSP will promote efficient production and utilization as well as encouraging the use of other fuels such as electricity, millennium gel fuel, and liquid petroleum gas by low and medium income groups instead of charcoal.
- Increasing of electricity exports to neighboring countries by 300 percent by the year 2010 from the current levels.

Three strategies are identified for the energy sector as follows:

- Enhancing the capacity of current energy delivery infrastructure through rehabilitation and/or refurbishment to ensure reliable and efficient supplies, and to ensure access by more people.
- Creating new energy delivery infrastructure through, for example, building new power stations, transmission lines, etc. to cater for increased domestic demand and export.
- Targeted interventions aimed at achieving particular results such as increased access and promotion of alternative technology.

APPENDIX A

Energy interventions

EFFICIENT CHARCOAL PRODUCTION- KBPS

Nr	General information	Answer
1	Give a brief description of the intervention (1 paragraph).	Project name: **KAFUBU SAWMILLS CHARCOAL PROJECT** The company KBPS had been dealing in export business since 1998 and in 2001 the board decided to venture in charcoal production. To amplify their production and mitigate on deforestation and poor use of biomass fuel the company decided to initiate this intervention.
2	Intervention history • Who initiated this intervention? • Why?	KBPS initiated the project The rural areas targeted are not connected to the national electricity grid.
3	When did the intervention take place? a. start year b. year of completion	Started 2002 Completed ..
4	What was the main objective of the intervention? *Examples:* • *Hardware (e.g. 10000 solar panels), or* • *Capacity (100 people trained in improved stove-making)* • *Income generation* • *Other*	• The objective was to produce charcoal by converting eucalyptus waste into domestic fuel for cooking and heating plus industrial use.
5	Have the main objectives been achieved? a. State achievements b. Compare with (4) above c. Are they different? d. If yes, why?	For the time it was in operation, the objective was achieved
6	Who has funded the project?	AREED
7	Who has executed the project?	Kankomo Business Promotion Services (KBPS).
8	What was the budget of the intervention?	It had a budget of USD $84,458.00
9	What were the real expenses?	20 kilns, delivery truck and power saws
10	What was the geographical scope of the intervention? a. Indicate: national, regional, local b. Indicate name of region or locality	• Lufwanyama district in Ndola rural • Peri-urban dwellers in Copperbelt and Lusaka provinces.
11	What is the target group of the intervention? • Type of group: rural, semi-urban, no focus • Size of population affected by intervention	• Ndola rural, and peri- urban of Copperbelt and Lusaka provinces • ≈ 547,000 household

Nr	General information	Answer
12	Are there links with other policy frameworks? *For example*: • *Intervention is part of larger energy policy framework (which?)* • *Intervention is part of framework with other policies (e.g. agriculture, education)* • *Other*	• It is part of the National Energy Policy
13	How was the progress of the intervention monitored? a. Was there a baseline study (situation before the project)? b. Was the progress on main objectives monitored during the project (how, which frequency)?	• It is uncertain whether the project was monitored.
14	What was the effect on income by the intervention? a. Has the intervention resulted in new jobs (or job losses)? b. If yes, how many? How was this estimated? c. How are losses/benefits distributed over the population? Are there groups who suffered/benefited more than others? d. Were effects on income taken into account in the project design/objectives? e. Were effects on income monitored during or after the intervention?	• Jobs were created (It increased as the number of kilns and production increased) • The effects on income were not monitored.

Nr	General information	Answer
15	What was the effect on the environment? *a.* Has the intervention had any effect on forest cover? *Examples:* • *Decreased deforestation* • *Increased deforestation* • *Forestation* b. What was % of people using biomass before and after the intervention? c. Which type of fuel was the target population using before and after the intervention? d. Are there any local effects on environment? Consider the following *possibilities*: *e. Air pollution (both outside and inside houses (decreased/increased, specify; note whether this has affected population health)* *f. Noise levels decreased/increased (specify)* *g. Other environmental effects on soil, air, water (specify)* h. Was the environment included in the project design and objectives? i. Were effects on the environment measured during or after the intervention?	• People used less firewood; less by at least 400 households • Production of quality charcoal • Minimisation of waste from Sawmill • The project helped lessen the market for sub grade charcoal
16	Social / development effects of the intervention: • What is percentage and number of population having access to electricity before and after the intervention? • What is the percentage and number of population having access to other commercial energy sources before and after the intervention? • Did the intervention change the price of electricity or fuel (specify)? • Were social/development effects of the intervention taken into account in the project design/objectives? • Were social/development effects measured during or after the intervention?	Benefits were many; • People stopped walking long distance to cut fire wood. • It was healthier to use high quality charcoal as it produced relatively less smoke. • In- door kitchen arrangement was enhanced since charcoal is easier to handle than logs of fire wood.

Nr	General information	Answer
17	Lessons learnt a. Has the project been evaluated? b. If yes, describe the results. What lessons have been learned? c. Is there potential for repeating this intervention elsewhere? Why?	• Competition between substandard charcoal and high quality charcoal is imbalanced as sub grade charcoal is too cheap compared to commercially produced charcoal. •

SOLAR BAKERIES- TSDC

Nr	General information	Answer
1	Give a brief description of the intervention (1 paragraph).	To provide high quality bread and buns while conserving the environment through the use of mobile small scale solar ovens
2	Intervention history • Who initiated this intervention? • Why?	**Sungulwanda Investments** - One of the Directors after attending the seminars on the use of Renewable Energy technologies. The idea was strengthened by the signing of industrial sector partnership with a US based company.
3	When did the intervention take place? c. start year d. year of completion	Started 2002 Completion 2004
4	What was the main objective of the intervention? *Examples:* • *Hardware (e.g. 10000 solar panels), or* • *Capacity (100 people trained in improved stove-making)* • *Income generation* • *Other*	The major objective was to manufacture high quality bread and buns for sale to communities that are not well served because of limited energy infrastructure. Two solar panels were purchased from TTT Inc Complete Solar oven with daily capacity of 193 loaves of bread and 118 buns. Two bakers were trained
5	Have the main objectives been achieved? e. State achievements f. Compare with (4) above g. Are they different? h. If yes, why?	a) They were able to bake the bread and buns b) The targeted production levels were not achieved, because of technology failure. The oven could not perform as expected.

Nr	General information	Answer
6	Who has funded the project?	TTTInc of USA, Sungulwanda Investments and E & Co
7	Who has executed the project?	Sungulwanda Investments
8	What was the budget of the intervention?	USD42,000
9	What were the real expenses?	Cost of the solar ovens Raw materials
10	What was the geographical scope of the intervention? c. Indicate: national, regional, local d. Indicate name of region or locality	Initially Njomona Township, Nakambala Sugar Estates Mapatizya mine area in Kalomo District, Southern province Later Eastern province, Luangwa and Petauke Districts
11	What is the target group of the intervention? 1. Type of group: rural, semi-urban, no focus 2. Size of population affected by intervention	Rural and peri urban
12	Are there links with other policy frameworks? *For example*: • *Intervention is part of larger energy policy framework (which?)* • *Intervention is part of framework with other policies (e.g. agriculture, education)* • *Other*	Part of the larger policy which is about promotion the use of renewable energy
13	How was the progress of the intervention monitored? c. Was there a baseline study (situation before the project)? d. Was the progress on main objectives monitored during the project (how, which frequency)?	There was no baseline study before. Project was monitored every two months though email, phone, fax and sometime physical visits
14	What was the effect on income by the intervention? f. Has the intervention resulted in new jobs (or job losses)? g. If yes, how many? How was this estimated? h. How are losses/benefits distributed over the population? Are there groups who suffered/benefited more than others? i. Were effects on income taken into account in the project design/objectives? j. Were effects on income monitored during or after the intervention?	a) New jobs were created. b) 8 c) The losses were mainly on the part of the company, as they could not bake the projected number of loaves and buns, and so income losses d) One justification at design level of the project was the impact income generation e) Not necessarily

Nr	General information	Answer
15	What was the effect on the environment? *j.* Has the intervention had any effect on forest cover? *Examples:* • *Decreased deforestation* • *Increased deforestation* • *Forestation* k. What was % of people using biomass before and after the intervention? l. Which type of fuel was the target population using before and after the intervention? m. Are there any local effects on environment? Consider the following *possibilities*: • *Air pollution (both outside and inside houses (decreased/increased, specify; note whether this has affected population health)* • *Noise levels decreased/increased (specify)* • *Other environmental effects on soil, air, water (specify)* n. Was the environment included in the project design and objectives? o. Were effects on the environment measured during or after the intervention?	a) The business had a positive impact on the environment since the ovens were using solar energy as opposed to firewood. b) Before intervention the population was being supplied with buns and bread which was baked by the locals using firewood. No effects on the environment
16	Social / development effects of the intervention: • What is percentage and number of population having access to electricity before and after the intervention? • What is the percentage and number of population having access to other commercial energy sources before and after the intervention? • Did the intervention change the price of electricity or fuel (specify)? • Were social/development effects of the intervention taken into account in the project design/objectives? • Were social/development effects measured during or after the intervention?	This interventions had no effect on the accessibility and price of electricity Social effects were included in the design of the project were employment creation. During the project some individuals were employed but were later laid off since the project could not perform as expected.

Nr	General information	Answer
17	Lessons learnt d. Has the project been evaluated? e. If yes, describe the results. What lessons have been learned? f. Is there potential for repeating this intervention elsewhere? Why?	a) There was monitoring and evaluation of the intervention b) The project could not perform as expected because of technology failure c) Not until the technology issue is sorted out.

PROVISION OF SOLAR ELECTRICITY- ESCOs

Nr	General information	Answer
1	Give a brief description of the intervention (1 paragraph).	The project was a new approach for providing electric light and other basic services to people in rural areas through solar photovoltaic (PV) systems. The approach was based on an Energy Service Company (ESCO).
2	Intervention history • Who initiated this intervention? • Why?	The Government of Zambia with the support of SIDA through the Department of Energy and Water Development. It was initiated because about 50% of the people in rural areas were without grid. Though not long-lived the PV alternative has had successful experience of providing solar-based electricity through ESCOs in Kenya and the Pacific region.
3	When did the intervention take place? e. start year f. year of completion	1998 to 2000
4	What was the main objective of the intervention? *Examples:* • *Hardware (e.g. 10000 solar panels), or* • *Capacity (100 people trained in improved stove-making)* • *Income generation* • *Other*	• To create a sustainable market by which the people in rural areas would access the services that can be provided by solar photovoltaic technology.
5	Have the main objectives been achieved? i. State achievements j. Compare with (4) above k. Are they different? l. If yes, why?	The project supplied 450 units of PV systems. It trained 10 technicians and 10 administrative officers.
6	Who has funded the project?	SIDA and Government of Zambia
7	Who has executed the project?	DoE, MEWD and SEI
8	What was the budget of the intervention?	It had a budget of USD $160,000,000 for 10 years.
9	What were the real expenses?	System expenses = 800USD/system Administrative = 40,000 USD/ year

Nr	General information	Answer
10	What was the geographical scope of the intervention? e. Indicate: national, regional, local f. Indicate name of region or locality	• Eastern province of Zambia
11	What is the target group of the intervention? • Type of group: rural, semi-urban, no focus • Size of population affected by intervention	• 4,000,000 persons
12	Are there links with other policy frameworks? *For example*: • *Intervention is part of larger energy policy framework (which?)* • *Intervention is part of framework with other policies (e.g. agriculture, education)* • *Other*	• It is part of the National Energy Policy
13	How was the progress of the intervention monitored? e. Was there a baseline study (situation before the project)? f. Was the progress on main objectives monitored during the project (how, which frequency)?	• A base line market survey was done in July 1998. • Bi-annual monitoring was planned
14	What was the effect on income by the intervention? k. Has the intervention resulted in new jobs (or job losses)? l. If yes, how many? How was this estimated? m. How are losses/benefits distributed over the population? Are there groups who suffered/benefited more than others? n. Were effects on income taken into account in the project design/objectives? o. Were effects on income monitored during or after the intervention?	• Jobs were created (20+) • Affordable electricity was provided • Long service hours in business places • superior quality of energy/ lighting than that of kerosene

Nr	General information	Answer
15	What was the effect on the environment? *p.* Has the intervention had any effect on forest cover? *Examples:* • *Decreased deforestation* • *Increased deforestation* • *Forestation* q. What was % of people using biomass before and after the intervention? r. Which type of fuel was the target population using before and after the intervention? s. Are there any local effects on environment? Consider the following *possibilities*: *t. Air pollution (both outside and inside houses (decreased/increased, specify; note whether this has affected population health)* *u. Noise levels decreased/increased (specify)* *v. Other environmental effects on soil, air, water (specify)* w. Was the environment included in the project design and objectives? x. Were effects on the environment measured during or after the intervention?	• People used less firewood; less by at least 400 households
16	Social / development effects of the intervention: • What is percentage and number of population having access to electricity before and after the intervention? • What is the percentage and number of population having access to other commercial energy sources before and after the intervention? • Did the intervention change the price of electricity or fuel (specify)? • Were social/development effects of the intervention taken into account in the project design/objectives? • Were social/development effects measured during or after the intervention?	Benefits were many; • People stopped walking long distance to buy kerosene and charge batteries. • Service businesses offered better services of lighting, and audio/ video. • It was healthier to use cookers which do not produce smoke.

Nr	General information	Answer
17	Lessons learnt g. Has the project been evaluated? h. If yes, describe the results. What lessons have been learned? i. Is there potential for repeating this intervention elsewhere? Why?	• The social factor is very instrumental in project design as the intervention failed because people rejected the project • The project learnt that it was necessary to install the panels according to the demand of each house.

PRODUCTION AND MARKETING OF JATROPHA- RCI

Nr	General information	Answer
1	Give a brief description of the intervention (1 paragraph).	RCI's main idea was to promote the production, marketing and utilization of the jatropha seed.
2	Intervention history • Who initiated this intervention? • Why?	Henry Ndonji Ngimbu, founder of the business RCI The major objective was to extracting oil that could be used for fuel energy. This will be done through Mobilising rural communities to grow the jatropha, extract oil by means of an oil mill and market the oil as a sustainable domestic, commercial and industrial energy to communities.
3	When did the intervention take place? g. start year h. year of completion	- 2003 Still on going
4	What was the main objective of the intervention? *Examples:* • *Hardware (e.g. 10000 solar panels), or* • *Capacity (100 people trained in improved stove-making)* • *Income generation* • *Other*	To engage in the business of producing, marketing and promoting the utilizing of jatropha in Zambia as a viable renewable energy substitute to existing inconsistent energies that include; wood-fuel, charcoal, diesel, paraffin and candles. • Oil expeller with 15HP diesel engine and base, oil filter • Through Zambezi West Bank Association for Agriculture and Industrial Development (ZWAAID) 280 members who were to start growing the nuts from which they were to getting an income. •

Nr	General information	Answer
5	Have the main objectives been achieved? m. State achievements n. Compare with (4) above o. Are they different? p. If yes, why?	Main objective were achieved. Oil was processed and was sold off to the local masses in Zambezi. The groups were mobilised and the they managed to sell their seed to RCI.
6	Who has funded the project?	Through AREED and the Entrepreneur
7	Who has executed the project?	Henry Ngimbu - RCI
8	What was the budget of the intervention?	USD10,000
9	What were the real expenses?	• Initial capital Equipment, • Raw material mobilisation • Business plan preparation
10	What was the geographical scope of the intervention? g. Indicate: national, regional, local h. Indicate name of region or locality	Zambezi district, North-Western province, Zambia
11	What is the target group of the intervention? 3. Type of group: rural, semi-urban, no focus 4. Size of population affected by intervention	Rural areas, district urban areas Zambezi district has over 2,000 households who grow the nut
12	Are there links with other policy frameworks? *For example*: • *Intervention is part of larger energy policy framework (which?)* • *Intervention is part of framework with other policies (e.g. agriculture, education)* • *Other*	This was part of the larger energy policy framework on Biofuels. Other policies on poverty reduction through job creation and increased income.
13	How was the progress of the intervention monitored? g. Was there a baseline study (situation before the project)? h. Was the progress on main objectives monitored during the project (how, which frequency)?	• There was no baseline before this intervention • There was monitoring through email, telephone and physical visits. This was done every two months.

Nr	General information	Answer
14	What was the effect on income by the intervention? p. Has the intervention resulted in new jobs (or job losses)? q. If yes, how many? How was this estimated? r. How are losses/benefits distributed over the population? Are there groups who suffered/benefited more than others? s. Were effects on income taken into account in the project design/objectives? t. Were effects on income monitored during or after the intervention?	a) New jobs were created. b) 28 groups consisting of 10 member each There was an equal distribution of benefits for the people in the groups identified. This did not actually stop other individuals who had the field for the nuts to cultivate more since the market for the seed was now available. During the design of the project one strengths was the number of jobs that would be created once the projection became operational To some extent, though mostly the monitoring was on the implementation of the project
15	What was the effect on the environment? *y.* Has the intervention had any effect on forest cover? *Examples:* • *Decreased deforestation* • *Increased deforestation* • *Forestation* z. What was % of people using biomass before and after the intervention? aa. Which type of fuel was the target population using before and after the intervention? bb. Are there any local effects on environment? Consider the following *possibilities*: • *Air pollution (both outside and inside houses (decreased/increased, specify; note whether this has affected population health)* • *Noise levels decreased/increased (specify)* • *Other environmental effects on soil, air, water (specify)* cc. Was the environment included in the project design and objectives? dd. Were effects on the environment measured during or after the intervention?	The was no effect on the environment Before the intervention, people were using candles, paraffin, diesel. After the intervention some people stated using the oil from jatropha for lighting Environmental effects were considered in the design of the project.

Nr	General information	Answer
16	Social / development effects of the intervention: • What is percentage and number of population having access to electricity before and after the intervention? • What is the percentage and number of population having access to other commercial energy sources before and after the intervention? • Did the intervention change the price of electricity or fuel (specify)? • Were social/development effects of the intervention taken into account in the project design/objectives? • Were social/development effects measured during or after the intervention?	The project had little bearing on the availability and price of electricity in the area.
17	Lessons learnt j. Has the project been evaluated? k. If yes, describe the results. What lessons have been learned? l. Is there potential for repeating this intervention elsewhere? Why?	The project has not been evaluated. There is however potential to the project to be replicated in other areas