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Knowledge network on sustainable household energy
in Southern and Eastern Africa

Scenario Analysis

Zimbabwe

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An initiative of



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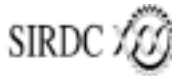
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Executive summary

Zimbabwe has got very good programmes to address issues on provision of household energy in Zimbabwe. It has enacted the rural electrification Act that is pushing for extension of the grid to the rural areas in Zimbabwe driven by the Rural Electrification Agency that is funded through a 6% rural electrification levy charged to all electricity consumers in Zimbabwe.

The renewable energy unit in the Ministry of Power and energy Development has identified more than 10 sites for stand-alone small hydropower stations in the Eastern highlands. They are also looking at extending the solar home systems project that proved to be successful through a pilot project that was successfully completed in 1998. The Unit would also like to promote the use of biogas technologies and raise awareness on IAP risks and encourage use of more efficient biomass stoves in the rural areas where the multi-pot metal grate stove is mostly used.

What is currently affecting these programs is the lack of foreign currency required to purchase equipment and accessories required in grid extension. There is also very limited funding for the projects that need to be undertaken in the Renewable energy unit. Donor flight and lack of investor confidence in Zimbabwe's macro environment and political ideologies and practices has resulted in the government being the only source of funding for all these and all other major projects in the country.

The problem of foreign currency shortages has also limited accessibility of other energy forms that include LPG and kerosene.

The wide use of biomass by the rural communities has seen women and children spending a lot of time in collecting firewood and preparing meals. The use of inefficient biomass stoves has also seen the prevalence of ALRI due to IAP. This has seen the women and children being further burdened by having to care for the sick. The time spend in collecting firewood, preparing meals and looking after the sick leaves very little time to embark on income generating projects. The accessible energy forms are also not very appropriate for these purposes. This has resulted in increasing poverty in the country.

Zimbabwe has also got in place a very good forestry protection programme. With limited resources, economic hardships and the Agrarian reform programme, enforcement has slackened a bit.

Despite all the good plans as stated above, the constraining factor in Zimbabwe is the capitalization for all the projects and the foreign currency to purchase equipment for the solar electrification, rural electrification and expansion of the generating capacity for Hwange and Kariba power stations. There is also need to encourage downstream projects with the RE programme to improve livelihoods.

There is also need to create an enabling environment that will attract foreign investors and create employment so that the energy forms will be affordable. There is also need to improve distribution systems for all energy form that include LPG and kerosene.

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I would like to thank Engineer Midzi of the Rural Electrification Agency (REA) for availing information on Rural Electrification drive I would also like to thank Mr. Tirivanhu and Mr. Gumbo for giving the briefing on the projects and strategies that are going to be followed by the Ministry of Energy and Power Development on the Renewable energies and energy supply to households in Zimbabwe.

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1 Introduction

Sparknet is a multi-stakeholder interactive Knowledge Network focusing on how people, in the context of acute poverty, can gain access to better energy services and improve their livelihoods.

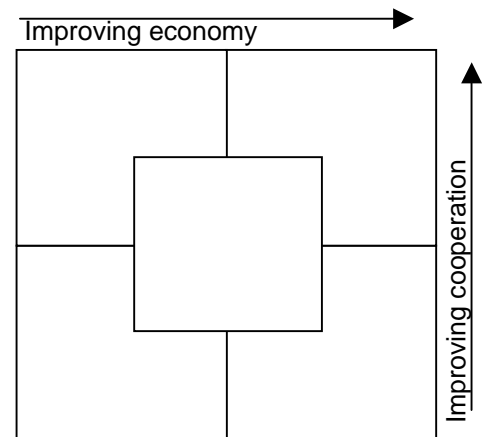
The network aims to make available resources for policy makers, companies, and civil society on energy poverty in Southern and East Africa. These are published through the network website www.sparknet.info. Sparknet focuses on three key themes – Health, Gender and Forestry – and the relationship of these issues with energy poverty. Output include detailed country reports, scenario analyses, and policy assessments. Two e-conferences will be held during the project – one on the scenarios, and another on policies.

Through a network of associates in Africa and Europe, Sparknet brings together 70 organisations and over 110 people from research institutes, NGOs, Governments and private companies.

1.1 Scenarios – what they are and why we have done them

Scenario analysis is simply a way of exploring realistic futures and predicting, based on our knowledge and experience how things could look in the future, how things could develop. As with all predictions we are likely to get it not entirely correct but the exercise is useful to stimulate debate on key issues. Scenario building is a *process* providing a structure for discussion and debate on what is could happen within a timeframe of the next ten to fifteen years. We will explore how things could change and how these changes are likely to impact on access to household energy in each country and across the Sparknet region. From these discussions, we hope to be able to make policy recommendations for poverty alleviation through identifying the key areas where policy action needs to take place. The intention is not to produce definitive studies but to stimulate relevant policy dialogue and serve as a basis for further research. Using management jargon we are looking here for 'blue sky thinking'. To do this we need to know the status quo (work-package 2, the country reports – which are now available on the Sparknet web site) and also to have identified influential organisations and projects and key actors who will shape the future of household energy provision (work-package 3, the draft version also available online).

External influences, such as changes in economic growth and levels of regional cooperation, are circumstances over which we have limited control. By identifying what policies might be effective under varying best and worst scenarios we have a good basis for debating potential policy actions which are pro-poverty alleviation, take into account our three themes – health, gender and natural resources / forestry – and are realistic under a broad range of external circumstances. As defined in the original Sparknet proposal, the intention is to develop a number of scenarios based on levels of economic prosperity and regional cooperation. The five possible scenarios – A to E – are shown in the 'box matrix' figure alongside. We believe it is sufficient to deal only with scenario A (business as usual), C (best case economy and co-operation), and D (worst case economy and co-operation). The other two are variations of these main scenarios. Both variables relate strongly to globalisation and market developments. This is the reason for including regional co-operation, since the Sparknet proposal was submitted to a funding window, which explored impacts of globalisation on energy poverty.



Because of the limited time/funding resources, these analyses are based – to a certain extent – on a subjective interpretation (the opinion of well-informed researchers, organisations and individuals in each country) of the impact of key variables and on findings of earlier studies (if available). It is focused mainly, but not exclusively on the issues identified by the three Northern partners on Health, Gender and Forestry (these papers are available online from the www.sparknet.info website.)

The scenario development follows the following process:

1. The development of peer reviewed scenario analyses for each country including 'business as usual' and alternatives based on levels of 'economic prosperity' and of 'regional co-operation'. This current document is a working version of the scenario.
2. An international e-conference (through the Internet) will be held based on the scenarios for each country. The provisional date for this conference is the end of September, over a 2-week period (see the www.sparknet.info website for additional details).
3. Publishing of conference proceedings from the e-conference on scenarios

The scenario analysis will lead naturally to an analysis of *'what do we think will happen'* and *'what do we want to see happening'* (or *how best we can deal with it if it does happen*) in each country and the region, and leads directly into work-package 5 (how to get from one to the other – ie. policy recommendations).

1.2 Background information on the Scenarios

Access to electricity is quite high in Zimbabwe, with figures of 39.7% (AFREPREN 2001), against Zambia's 12% (AFREPREN 2001) and Uganda's 3.7% (AFREPREN 2001). It is however lower than SA's 66.1% (Eskom 2002)

In Zimbabwe Fuelwood is used by 62% of urban and rural households (Mapako 2001) and maize cobs by 4% of the households (ProBEC 2000) for cooking. Fuelwood is used in the open metal grate stoves and very few households are known to use improved stoves. Use of cow dung is prominent in such areas close to Harare such as Zvimba and Seke communal lands. Biogas is used but on a minimal scale. Electricity is used by 24% of the households and 61% of these are in urban areas. 31% of urban households use kerosene. Wick type kerosene stoves are common with civil servants in rural areas where they have no access to electricity and in poor urban households. All the fuels and stoves are normally used in preparing all the meals. In rural areas where there are kerosene stoves they are preferred over fuelwood stoves for preparing breakfast for school children, as they are faster.

Wood is the primary source of energy for space heating. This is done on open fires. To those with access to electricity, electric heaters are normally used. For lighting electricity is mainly used where it is available but in the areas where there is no access to electricity, candles, kerosene and light from the wood fires are widely used.

The renewable energy unit in the Ministry of Energy and Power Development is in the process of drawing up a white paper that they hope to have completed before the end of the year. The areas that they would like to work on include extension of the solar home systems project, putting up mini-hydro stations, dissemination of the biogas technologies, testing and developing a gel fuel to substitute kerosene and promotion of the use of efficient biomass stoves (information obtained from interviewing the Deputy Director-Renewable energy unit, Mr Tirivanhu)

A pilot project on the promotion of solar home systems, funded through the GEF program in 1998, was successfully carried out with at least 14 000 homesteads being electrified across the country. After the success of the pilot project, the intention was to extend the project. However, the project extension was disturbed by the foreign currency problems that hit the country after the completion of the pilot project. Currently the project cannot be resumed even though the foreign currency situation has improved because of the very low value of the dollar against other currencies, which has made importation of the system components prohibitively expensive. It is currently estimated that a 4-light system, complete with the deep cycle battery, panels, light bulbs and all other accessories would cost Z\$6 million dollars, a figure that cannot be afforded by the poor rural folk who more likely to benefit from this exercise.

The Ministry of Energy and Power Development through the Renewable Energy Unit, has also identified potential small hydro sites for stand-alone units in the Eastern highlands. The identified sites are on the following rivers, Pungwe, Duru, Gaerezi, Tsanga (3 sites), Mudzoro, Kute, Nyangombe, Jora/Nyamukai and Manyuchi dam. Feasibility studies have been carried out for the first three sites and on one site on the Tsanga River. The problem however is that because of donor flight from Zimbabwe due to the political environment, there is currently no money to put up the hydro stations. The Ministry of Energy and Power Development intends to come up with incentives to encourage the local people to contribute towards the construction of these sites. These may be very difficult especially with the current economic conditions.

The Renewable energy unit also intends to disseminate the biogas technologies in the rural areas and to the newly resettled farmers. They intend to build capacity in groups of people who will then take up the biogas construction as an income-generating project. To make the technology affordable they intend to set up a revolving fund so that the beneficiaries can pay for the construction of the digesters in instalments.

Kerosene has disappeared from the formal market because of the unsustainable-gazetted price of \$119/litre against a black market price of \$6 500/litre. The Renewable energy unit in the Ministry of Energy and Power development is working with an investor who is producing a gel fuel from ethanol to replace kerosene in food preparation. The gel uses a special stove that is being manufactured by a local company called Kango. The price of the gel compares well with the gazetted price of kerosene. However currently the Renewable energy unit is working assisting the investor in carrying out tests to

Scenario Outlines

ascertain the calorific value of the fuel and on establishing the emissions that are produced from the fuel. If the emission levels are within the acceptable limits the y will assist in promoting acceptance of the product as a substitute to kerosene.

Lastly the Renewable energy unit would like to embark on a campaign to promote the use of efficient biomass stoves in rural communities.

The Rural Electrification (RE) drive in Zimbabwe started in the 80s with grid extension into growth points and national service centres. RE went into full swing following the endorsement by Cabinet in 1997 of the Rural Electrification Master Plan. The Rural Electrification Act of 2003, funded from the 6% electrification levy charged to all consumers, has seen the grid being extended to all districts in Zimbabwe (Mr Midzi-Head Rural Electrification Agency, REA). Among the completed projects are schools, homesteads, business centers, chiefs' homesteads, clinics, agricultural Government offices, irrigation schemes and other infrastructure. These developments cuts significantly transformed the way people in the rural areas live and work (Zimbabwean Herald Report, 26 August 2004, by Tawanda Kanhema).

To make the electrification accessible, billing of power connection was adjusted to follow the needs of rural consumers. The REA offers packages where they provide 60 % capital subsidy designed for contractors and other business-people. Under the scheme, consumers pay 40 % of the costs. The Electrification Guarantee Scheme, on the other hand, allows communities with connection shortfalls to pay 20 % of the connection costs. The balance is settled over three to five-year periods.

2 Development of the scenarios

This section of the report is the main body. The summary table in Appendix A gives an Overview of the Scenarios and the important points in each section.

2.1 Business-as-usual scenario

Inflation in Zimbabwe rose from an annual rate of 32% in 1998 to 59% in 1999, to 60% in 2000, to over 100% by yearend 2001, to 228% in early 2003. It had risen to over 600% by end of 2003 (IMF press release No. 04/67). External debt was sitting at US\$3.9 billion (2002 est.) and the debt to the IMF was sitting on US\$290 by the end of February 2004. The government's land reform program, characterized by chaos and violence, has nearly destroyed the commercial farming sector, the traditional source of exports and foreign exchange and the provider of 400,000 jobs. Real GDP growth rate was estimated at -13% (2002). GDP composition by sector in 2001 was *agriculture*: 18%, *industry*: 24% and *services*: 58% (2001). The country had a trade deficit in 2001, with exports of \$1.57 billion f.o.b. (2001 est.) and imports of 1.739 billion f.o.b. (2001 est.). Unemployment rate was at 70% (2002 estimate.) and the population below poverty line was 70% (2002 est.) Electricity – production was 6.735 billion kWh (2001) while consumption was 9.813 billion kWh (2001) and imports were 3.55 billion kWh (2001) ([www. Travelblog.org](http://www.Travelblog.org))

Although the New RBZ governor started external debt repayments and put in place policies to arrest the runaway inflation things are still tight with inflation sitting on 362.9% y/y in July 2004 (www.zwnews.com). Unemployment levels have become much higher and are estimated to be over 75% (2002 est.). The economic climate is harsh and people have very little disposable income. Foreign currency inflows are still not sufficient to meet the country's import requirements.

New farmers that have settled into former commercial areas have very little money and know-how on farming techniques and general conservation issues.

Donor flight due to disagreements with the international community on the land reform program, the rule of law and human rights has left the government being the only source of funding for almost all projects in the country. There are limitations to the imports that are coming into the country because of foreign currency shortages. The productive sector is struggling and investor confidence is still very low.

The country will continue its cordial relationships with the other African nations in the African Union and the SADC. Partnerships with the countries from the Eastern block like China are strengthening.

2.1.1 Fuel Access

The Rural electrification drive will not improve access to electrical energy significantly because the targets for this year will not even be met because foreign currency problems have seen the REA being unable to purchase all the needed materials for grid extension. As a result of the economic hardships even the villages that are close to the grid may not be able to access electricity even though they will be given the subsidy because they will not be able to afford to pay the 40% balance that has to be paid up after the 60% capital subsidy contribution from REA. As a result of foreign currency problems very little is being done in connecting new clients onto the grid in the urban areas. New suburbs like Zimre and Mount Pleasant heights have gone for more than two years without being connected because of foreign currency problems.

In rural areas firewood, collected mostly from indigenous trees that take long to mature, should become more scarce. Since most of the households use firewood and population density is quite high in the communal areas, distances to collect firewood will continue to increase. The foreign currency shortages and the low-gazetted price of kerosene of \$119/L against a black market price of over \$6000/L as well as the relatively poor distribution means that kerosene is unlikely to become a significant source of fuel for cooking and lighting. The same goes for LPG.

Advanced research in ethanol gel and the relatively cheap price of the fuel may see it playing a bigger role, firstly in the urban areas if it is well promoted.

There is really nothing being done on charcoal and as such it should continue to play a very marginal role as a fuel source in Zimbabwe.

The high prices and the need to import most components for solar homesystems will generally limit access to electricity from solar energy.

2.1.2 Fuel choice

The economic hardships have seen a good percentage of urban dwellers being unable to afford electricity. They are therefore using electricity for lighting and to power such appliances as television sets and turning to fuelwood for cooking and water heating. If well promoted the ethanol gel may play a significant part as a source of fuel for cooking in the urban areas as kerosene remains scarce due to foreign currency shortages. In the rural areas, fuelwood will remain as the most important source of energy for cooking and wood fires will still play a significant role in lighting. Charcoal, LPG and kerosene will not be available to most households because of the reasons stated above. Agricultural residue may play a more significant role during the harvesting period when it is available because of the increased scarcity of fuel wood and the longer distances that will have to be travelled to collect firewood. Candles will also continue to be the source of lighting in the rural areas

2.1.3 Gender rural

In the rural areas women and the girl child are burdened with the responsibility of all kitchen chores that include firewood collection and meal preparation. With the continued high dependency on fuelwood for

cooking and the relatively high population densities in most rural communities, the distances travelled to collect firewood and the time for collection will continue to increase. The female-headed homesteads will remain poor, as there will be little time left for income generating activities. Prevalence of ALRI in the females will continue to be higher than those of males because of the higher periods of exposure to pollution. The effect of ALRI on infants will also remain high as they also spent a considerable time in the smoke filled kitchens with the women folk.

Lack of access to sources of energy such as electricity will generally mean that most of the income generating projects in the rural areas will be manual, which in turn implies that the living standards for the people will be low and poverty will be prevalent in most households.

The girl child will remain disadvantaged in school because of the time spent in meal preparation and wood collection.

Communication and access to such gadgets as TVs and the Internet, will remain low in the rural areas thereby further limiting the horizon of all people especially students in the rural areas.

2.1.4 Health

In the business as usual scenario there is very little being done in disseminating information on improved biomass stoves and the risks of IAP. Although the Ministry of Energy and Power Development is very keen on doing so, currently they do not have the funding to push through this project. With over 62% of the population in Zimbabwe using biomass for cooking, and with very small number of these people being aware of and capable of accepting the improved biomass stoves the prevalence of ALRI will continue as is due to IAP.

Again as a result of the lower standards of living due to very little meaningful income generation because of lack of access to electricity, malnutrition should continue to affect the rural people with the most significantly affected age group being that below 5 years and those above 65 years.

The prevalence of risks to diseases mentioned above increases the burden on households because of the need to look after the sick. This has the effect of increasing poverty among the people.

2.1.5 Forestry

The problem of affordability of electricity to the urban poor has forced some households to resort back to use of wood fuel for cooking and water heating. Wood is legally poached from the peri-urban areas and rural areas that are relatively close to the urban areas to cut down on transportation costs. This has led to rapid deforestation of the forests in these areas.

The wide usage of biomass as a source of energy because of lack of alternative sources of energy has seen rapid deforestation of the natural forests. Some communal areas like source are already facing severe wood shortages and are being forced to buy wood from other areas. Use of indigenous firewood has further accelerated the depletion because of these take longer to mature. The droughts that have been experienced in Zimbabwe have further worsened the situation.

The unplanned Agrarian reform programme has seen people move into what were formerly commercial farming areas. As a result of the larger number of households that have settled on the farms that had one homestead and because of lack of money to buy the electrical gadgets to use, most of these have resorted to use of wood fuels although the farmhouses may have been electrified. This has seen trees being cut down in areas that were formerly covered by forests. The larger numbers of homesteads that have to be settled on these commercial farms have also seen more land being cleared to make way for settlements. The cultural belief of burning forests before the onset of the rainy season as a way of ensuring abundant rainfall, the newly resettled farmers have also burnt down the forests thereby causing changes to the natural flora and opening up what were formerly very dense forests. This is very evident in the Mazowe farming area.

2.1.6 Policy options

- Funding for the development of the stand alone hydro-power units and solar home systems drive
- Pricing policies that will not only provide affordable sources of energy to all people but also look at their being enough returns to attract investors to source for and distribute the energy.
- Work on distribution channels to make the energy accessible to all people
- Built up investor confidence in the country to enable foreign players to participate in areas where foreign currency is needed, expansion of generating capacity etc.
- Dissemination of information on IAP and ALRI with regional and cross ministry participation
- Look at the plight of women and children
- Look at the effect of the land reform programme on deforestation and put measures in place to prevent it

2.2 Worst-case scenario

In this scenario the inflationary environment will continue and even become worse. It also assumes a foreign currency crisis against the fact that most of the equipment and accessories required in the rural electrification program have to be imported. The foreign currency shortages will also affect the electrical energy import purchases from the DRC, Mozambique and South Africa especially considering that the country imports over 40% (2001) of its power requirements. The foreign currency shortages will affect the importation of LPG and kerosene. The government will not have money to fund the renewable energy unit in the Ministry of Power and Energy Development to extend the solar home systems project, build the stand alone hydro-stations in the identified sites and educate people on the use of more efficient biomass stoves. Unemployment levels will be higher than the current estimated figure of 75%. Poverty will prevail with over 70% of the population still living below the poverty datum line.

Investor confidence will remain low and relations with the donor community will not improve such that most projects will have to be funded by the government.

The Agrarian reform programme will continue as is with the people continuing to move between farms and doing very little productive work because of shortages of inputs.

2.2.1 Fuel Access

Access to electricity will go down if the Power Utility fails to pay for electricity, which contribute over 40% of its power requirements. The resultant load shedding and power cuts will affect industry, reduce the GDP and put further strain on the standards of living of the Zimbabweans and increase poverty. Use of biomass in food preparation, which is normally prevalent when there are power cuts to residential loads, will increase. In the rural areas use of biomass will continue because of lack of other alternatives such as LPG and kerosene, which will also be in short, supply because of foreign currency shortages. Poverty will ensure that even those on the grid will minimise usage because of unaffordability of the electricity. Use of agricultural residue will be on the increase during and immediately after the harvest seasons.

2.2.2 Fuel choice

A higher percentage than the current 62% will be dependent on biomass because of the limited access to electricity and because of not being able to afford the electricity when it is available because of increased poverty. There will also be very little choice because foreign currency shortages will limit the LPG and kerosene imports. Extension of solar home systems will not be possible because of the high foreign currency component required in the purchase of system components.

2.2.3 Gender

The burden on women and children will increase because with more people getting dependent on biomass, distances and time spent in collecting firewood will increase. Meal preparation times will be relatively higher. ALRI will still be prevalent because of limited dissemination of information on IAP risks and use of more efficient biomass stoves that have fewer emissions. Poverty will remain prevalent in rural areas because the prevalence of ALRI will mean that the women and children will have to spend time in caring for the sick. The girl child will be disadvantaged in school because they will have less time for study and will probably be tired because of the burden of collecting firewood, difficult and lengthy meal preparation, and caring for the sick. Prevalence of ALRI will be higher in the women and children as they spend more time in the polluted kitchens. This lack of access to energy will mean that there will be very few successful income generating projects from the rural areas.

In the urban areas, the women from the urban poor households will spend more time in meal preparation. Risks of IAP are very limited in the urban areas because food preparation using wood fuel is done outside the house on open fires. This however means that the fires are less efficient and relatively more wood will be required to prepare the same meal in the urban areas as compared to the rural areas.

2.2.4 Health

Prevalence of ALRI will continue with the rural women and children being most affected as they spend more time in the kitchens. This will generally increase poverty in the rural areas. Malnutrition should also be prevalent in the rural areas because the women and children will spend more time in collecting firewood and wood preparation and will have little time left for income generating projects. The limited choice of alternative and better sources of energies will prevent women from embarking on income generating projects to improve their standard of living.

2.2.5 Forestry

There will be rapid deforestation in peri-urban areas and the communal areas close to the urban areas as a result of the increase in wood fuel usage in the urban poor households. There will also be rapid deforestation in the rural areas and especially in the former commercial farm areas because of the need to clear land for settlement, the need to cut down trees for firewood and the cultural practices of burning down forests just before the onset of the rainy season.

2.2.6 Policy options

- Work on drawing up data on levels of IAP and verification of link between this and ALRI
- Find mechanisms to provide wide choice of energy forms for household use and for income generation projects to improve standard of living of the rural and urban poor
- Come up with schemes for people to purchase the requirement equipment and gadgets to use with the different sources of energy
- Regional co-operation on IAP and ALRI information dissemination, management and control
- Promote projects and production with the view to increase foreign currency inflows so that it would be possible to implement the RE programmes, and extend the current generation capacity by the Power Utility
- Commercialisation and opening up of the power sector to private investors (ongoing)
- Look closely at electricity supply through the SAPP and

2.3 Best case scenario

This will be characterised by an economic boom with no trade deficits such that the country will have as much foreign currency as it needs. Improved foreign currency inflows will also increase the supplies of LPG, kerosene and money to purchase equipment and accessories required by the utility to connect up new customers and by the rural electrification agency to continue with the grid extension from the rural district offices to all other consumers in the rural areas.

There will be an improvement in relations between Zimbabwe and the donor community such that those who had discontinued the funding of such projects as the solar home system electrification project and the development of small hydro-stations like that on the Manyuchi dam will be continued. There will be investor confidence such that projects that include the extension of the Kariba hydro-station and the Hwange thermal plant will have takers. The Renewable energy unit in the Ministry of Energy and Power development will be in a position to mobilise funds to disseminate information on use of improved and more efficient biomass stoves and promote the use of ethanol gel biogas technologies.

The economic boom characterised by high employment levels and general increase in the standard of living. This will enable the urban poor to purchase and use electricity and will also enable more villages to access electricity using the RE scheme, as they will have money to pay for it.

2.3.1 Fuel Access

There will be increased availability of electricity through the successful expansion of the grid by the REA, extension of the Hwange thermal and the Kariba hydropower station outputs and more connections in the urban areas. Generally, this will improve accessibility to electricity in both rural and urban areas. In the rural areas continuation of the solar home systems project and the installation of the stand alone small hydropower stations will further increase electricity accessibility especially in areas that will be far-away from the grid. Consumers will also have access to LPG and kerosene subject to the development of a good distribution system.

2.3.2 Fuel choice

Almost all consumers will have many fuel choices such as electricity (grid, stand alone hydro and solar), biomass, kerosene, ethanol gel and LPG. Charcoal will still play a limited role as a source of fuel. In an economic boom it is assumed that people will have the money to purchase the energy sources such that the determining factor of which fuel to use will be selected will depend mainly on the application, convenience and ease of accessibility, price (on a comparative basis) and cultural practices that include the fact that even though they may have electricity, rural communities prefer to use wood fuel for cooking.

2.3.3 Gender

Access to electricity, LPG, kerosene and ethanol gel and the ability to pay for them means that the burden on women and children for collecting firewood may become less in the rural areas. Wood fuel usage may not fall out completely because of cultural values that may still see people using electricity for lighting and l pumping water but still using wood fuel for cooking. Meal preparation times will reduce significantly. The reduced incidences of ALRI will reduce the burden of caring for the sick. Women will have time to the suitable energy and more time to attend to other chores like working on income generating projects. Poverty will generally go down. Improved communication and use of Internet facilities will broaden the horizon and ideas from all people in the rural communities and this should reduce poverty. However, with access to electricity women may do more and sleep later than normal doing other jobs such as ironing or sewing. The children, especially the girl child, will have more time to concentrate on schoolwork and get better opportunities to improve their live and prospects for prospering in their chosen career paths.

Although, it is assumed that even with the other alternative sources of energy, there will still be an element of biomass usage. The Renewable energy unit, in Ministry of Energy and Power Development, should be able to disseminate information on IAP and ALRI if they get enough resources. This will then complement the efforts of some NGOs like gtz-PROBEC who were already working on this in areas that include Hurungwe and Gwanda.

2.3.4 Health

There will be reduced incidences of ALRI because of the switch to other energy sources such as electricity. Dissemination of information on improved biomass stoves that are more efficient and the risks of IAP should also further reduce the incidences of ALRI. Malnutrition should also go down because of the income generating activities that will ensure that there is enough food for people to live on.

2.3.5 Forestry

With sufficient funds, the land reform programme will be properly funded and may then take off the ground. The farmers may then be able to afford electricity because most of the farms are very close to the grid and would be easily connected. This should then ease off the threat of rapid deforestation by the new farmers. The use of alternative sources of energy which include electricity, LPG, kerosene and ethanol gel should also reduce the demand on fuelwood and eventually again reduce the effect on deforestation. Although there is forest management with 31% of the forests being protected in Zimbabwe, the current economic hardships and the reform programme makes administration of the laws and their enforcement very difficult. The tree-planting programme can also be managed, given the required resource and intensified especially in areas such as the Seke communal lands where the land has become bare due to the need for firewood.

2.3.6 Policy options

- Planning of the afforestation programme
- Work on the distributional channels of LPG and kerosene so that they reach all people including the rural communities
- Work on verification of dissemination of information on IAP and risks on ALRI, draw up programmes to encourage people to use more efficient biomass stoves, regional programmes may be embarked on since there are similarities in wood usage patterns especially in the sub-Saharan African countries
- Have Ministries join hands on common issues such as the Ministry of Environment, The Ministry of Health, Ministry of Natural Resources and the Ministry of Energy and Power Development on biomass energy
- Encourage downstream usage of electricity especially to the beneficiaries of the REA to embark on income generating projects
- Encourage use of clean energy technologies

Closure

The issues that have to be addressed in the Zimbabwean situation include putting in place mechanism to provide a wider choice of energy forms to all people, encourage downstream income generating activities once the energy forms are available to eradicate poverty. There is need to look at all distribution channels and pricing policies of the energy forms to make them affordable to all people. There is also need to address the risks of IAP, levels of IAP and ways of reducing the risks to households. There is need to look closely at the link between failure to access certain energy forms and the impact on poverty and address this.

Zimbabwe has some very good programmes such as the RE drive and forest management, which need to be well funded. Downstream programmes that encourage setting up of micro-enterprises, which should eventually work towards eradicating poverty, should complement the REA drive. This calls for linking up of the REA and other rural developmental arms like AREX (For setting up irrigation schemes).

References

www.sparknet.info

www.travelblog.org

IMF press release No. 04/67

Energy Policy: Special Issue, Africa: improving modern services for the poor, Volume Numbers 11-12, September 2002

Appendix A Overview of scenarios

Please do not be constrained by the space available here. The table will expand as necessary and will probably span a number of pages

Criteria/Issue	A: Business as usual	C: Best case economy and co-operation	D: Worst case economy and co-operation
<p>Current situation – short summary: What are the key issues / constraints which you have identified within your country regarding provision of household energy at the current time – particularly with regard to health, gender and forestry?</p>	<p>Foreign currency shortages slowing down the RE drive, limiting purchases of LPG & kerosene and slowing down new urban connections onto the grid and hence limiting fuel choices available to users. Insufficient funding to promote other technologies such as biogas & ethanol gel and disseminate information on IAP. High unemployment levels and a high percentage of people living below the poverty datum line making other forms of energy unaffordable to some people. Women and children burdened with firewood collection and spending long hours in the kitchen and being at more risk of suffering from ALRI. Communication problems in some areas because of lack of access to other forms of energy. Use of biomass in inefficient stoves leading to rapid deforestation.</p>		
<p>What are the impacts on Fuel Choice for household energy under BAU and worst case / best case scenarios for the economy and regional co-operation over the next 10-15years?</p>	<p>Very limited choice, biomass widely available in both rural and urban areas. Electricity available but sometimes not affordable to some poor consumers.</p>	<p>Wide choice of energy form to choose from. Alternatives include electricity, LPG, kerosene and ethanol gel. Role of wood fuel still significant because of cultural considerations. Wide use of improved and more efficient biomass stoves.</p>	<p>Limited choice of energy form alternatives. Biomass most available to all classes of people. Reduced access to electricity.</p>
<p>What are the impacts on Fuel Access for household energy under BAU and worst case / best case scenarios for the economy and regional co-operation over the next 10-15years?</p>	<p>Limited access to electricity in the rural areas despite the RE drive because of affordability and inability to secure enough foreign currency to buy all equipment and accessories required by the REA to electrify all intended institutions. Shortages of LPG and kerosene because of foreign currency shortages. Distances to collect firewood increasing in most areas. Inability to make people switch from the traditional biomass stoves to more efficient ones</p>	<p>Large percentage of the population will have access to electricity due to the RE drive and ability to clear backlog on new connections in urban areas. With the grid now extended to all rural districts in Zimbabwe, access can go up to as high as 80%. The expansion of the generation output of Hwange and Kariba power stations should also increase security of the supply. Regional co-operation which can also ensure that the cheapest potential power generation points in the region</p>	<p>Limited access to electricity in the rural areas despite the RE drive because of affordability and inability to secure enough foreign currency to buy all equipment and accessories required by the REA to electrify all intended institutions. Shortages of LPG and kerosene because of foreign currency shortages. Distances to collect firewood increasing in most areas. Inability to make people switch from the traditional biomass stoves to more efficient ones</p>

Scenario Outlines

Criteria/Issue	A: Business as usual	C: Best case economy and co-operation	D: Worst case economy and co-operation
		are developed may make electricity relatively cheaper and affordable to more people. Development of the small hydro-stations in identified sites. Use of solar home systems in areas that are difficult and expensive to extend the grid to.	
<p>In the left hand side boxes below, review specialist paper and others and identify issues which will be impacted by the changes identified above</p>	<p>In each of the boxes below, jot down points on the relevance, developments, implications of each of the scenarios on the issues raised in the left hand column.</p>		
Health Issues - impacts on health	Prevalence of IAP and the risks of ALRI. Malnutrition in rural areas as women and children spent more time collecting firewood and preparing meals with limited time for income generating projects	Reduced IAP risks. Improved nutrition because of less time spend in firewood collection and food preparation which will leave more time for income generating projects. Malnutrition related disease levels will go down	Prevalence of IAP and the risks of ALRI. Malnutrition in rural areas as women and children spent more time collecting firewood and preparing meals with limited time for income generating projects
Health Issues - policy options on health	Regional drive to work on IAP levels, creating awareness on IAP and ALRI and promotion of use of efficient biomass stoves and ventilation requirements in kitchens	Regional drive to work on IAP levels and continued dissemination on ALRI and promotion of use of efficient biomass stoves (cultural considerations may still see wood fuel playing an important role even when electricity is available)	Regional drive to work on IAP levels, creating awareness on IAP and ALRI and promotion of use of efficient biomass stoves and ventilation requirements in kitchens Put in place mechanisms to provide access to cleaner energy sources that have reduced risk to users
Gender Issues - impacts on gender	Women and children spend much time in collecting firewood and preparing meals. Higher risk of women and children of catching ALRI due to exposure to IAP for longer periods. Burden on women of looking after the sick caused by ALRI which increases	Women and children will have more time to concentrate on other income generating activities because of reduced time to collect firewood and for meal preparation. Fewer IAP risks and reduced burden of caring for the sick. Empowerment of women	Women and children spend much time in collecting firewood and preparing meals. Higher risk of women and children of catching ALRI due to exposure to IAP for longer periods. Burden on women of looking after the sick caused by ALRI which increases

Scenario Outlines

Criteria/Issue	A: Business as usual	C: Best case economy and co-operation	D: Worst case economy and co-operation
	poverty	through income generation and by starting up micro-enterprises.	poverty
Gender Issues - policy options on gender	Empowerment of women by availing wider choices of energy forms that do not take too much of their time. Where there is access to electricity, encourage starting up of micro-enterprises Look at the barriers of the girl child in furthering education for betterment of her future	Assistance of women in availing starting capital for income generating projects. Policies to assist and encourage all that benefit from the RE programme to put energy to improve livelihoods through starting up of micro-enterprises.	Empowerment of women by availing wider choices of energy forms that do not take too much of their time. Where there is access to electricity, encourage starting up of micro-enterprises Look at the barriers of the girl child in furthering education for betterment of her future Looking at tariff structures and classes to enable the disadvantaged to afford the different energy forms
Forestry Issues - impacts on forestry	Rapid deforestation as people from both urban and rural areas look for firewood	Reduced deforestation	Rapid deforestation as people from both urban and rural areas look for firewood
Forestry Issues - policy options on forestry	Enforcement of the forestry protection laws by ensuring that people have access to and can afford other forms of energy	Enforcement of the forestry protection laws Encourage switching to other energy forms to discourage people from using wood fuel.	Avail funds to develop the small hydro where possible. Look at distribution channels for provision of all energy forms