Energy for Poverty Alleviation in Sahel
IE4Sahel

Assessment of the current situation on energy policy and regulations in Sahel

Contract N°. EIE/04/131/S07.40673

Participants:
IST – Instituto Superior Técnico - Portugal
ESD – Energy for Sustainabel Development Ltd. - UK
CRES – Center for Renewable Energy Sources – Greece
ARC - AGRHYMET Regional Center – Niger - subcontractor
D3 - Assessment of the current situation on energy policy and regulation in Sahel

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Title: Energy for Poverty Alleviation in Sahel

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1. Summary

This report - Assessment of Current Energy policy and Regulations - D3 - is a deliverable foreseen by the project Energy for poverty alleviation in Sahel - IE4Sahel. The report contains a brief summary of the IE4Sahel project objectives, explains the role of this deliverable in the project, the methodology used to achieve it, and the analysis of the regional and national energy policies and regulations and, in appendix, the policy questionnaire used for the analysis.

2. The IE4Sahel project.

The objective of the IE4SAHEL project is to contribute to poverty alleviation for a wide variety of energy users through the development and dissemination of appropriate and sustainable energy policies at a regional and national level in the Sahel region. Efficient and effective energy policies and regulations can be a powerful tool to alleviate poverty, creating sustainable energy systems and increasing the penetration of renewable energy technologies and efficient energy use techniques.

The project is designed on two different pillars, on one side scientific and policy research about the role that energy policies can play in poverty reduction in Sahelian Countries, and on the other side, as a cooperation project, the IE4Sahel will perform capacity building and networking activities.

Among the various options to achieve these goals, the creation of a dedicated workforce within an existing local reference centre has been identified as having the greatest potential for sustained long-term impact. The reference centre chosen in the Sahel region is ARC – AGRHYMET Regional Centre, a 30-year long established Research Centre that already has a strong presence in the search for appropriate technology and a suitable structure to embrace the task.

A comprehensive assessment of Energy Policies and regulations in the Sahelian Countries is an important step in the process of opening the policy discussion, it helps the circulation of

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1 AGRHYMET stands for Agriculture, Hydrology and Meteorology
information, and it is a necessary step in the process of empowerment of the centre ARC aghrymeth for dealing with energy issues.

3. - Assessment of Current Energy policy and Regulations - methodology

The assessment of energy policies and regulations is made on the basis of a questionnaire (presented in the annex I) that has been used as a grid of analysis for the literature and information for all the countries, the info collected have been re-elaborated and included in this report. The methodology to assess the current energy policies and regulations in the Sahel has been based on literature research, and direct confrontation with local stakeholders during two events organised by the project IE4Sahel, in Niamey, Niger, and Ouagadougu, Burkina Faso.

The main documents analysed for each country have been, in particular (and upon availability):

- Poverty Reduction Strategy Papers and their progress reports;
- Household and Poverty Surveys
- Energy Poverty Action Plans
- IMF and World Bank regular country reports, art. IV consultations, statistics, memorandum of understandings and other policy documents;
- World Bank project database
- Millenium Development Goals country reports
- Human Development reports
- Results from workshops and seminars on energy policies organised by multilateral or regional organisations (ESMAP, ECOWAS, UNDP etc. )
- Data from National Governments
- Data from National Energy Utilities
- Literature on international journals
- International and regional policy agreements
- Energy utilities balance sheets and reports
The aspects analysed for each country have been the followings:

- General Poverty and Development Data and status of the Poverty Reduction Strategy process
- Energy and electricity status: installed capacity, annual production, fuel mix, electrification level, electrification rates, electricity consumptions, electricity tariffs and main development projects.
- Energy Reform Status: Structure of the energy industry, ownership of the energy industry, regulations of the energy industry.
- Regulations in the fossil fuel sector
- Regulations in the biomass / forestry sector
- Energy and poverty linkages: presence of an energy and poverty action plan, presence of an agency for rural electrification, main initiatives to address energy poverty.
- Other issues

The approach utilised is not only the description of the regulations in the various energy sectors of the different countries, but also, where possible, the collection and analysis of data regarding production and consumption patterns, development and policy reforms process. It is evident that regulations and policies are only one aspect of the issue and that the relationship between a regulatory measure and the production and consumption pattern is difficult to isolate, and depends on many other factors, for example financing. It is also true anyway that real field data are the only possible signal of the magnitude of the problems and of the effectiveness of the policy and regulatory framework put in place.

4 - Barriers and limits

The availability of data is very different from country to country. The countries that experienced some process of reforms, and the most populated countries, are the ones with more easily accessible data (Mali, Senegal, Cape Verde). For other countries available data are more limited, as limited is the presence of literature.

Availability and reliability of data is always a serious issue everywhere but specially in developing countries with weaker resources for statistical institutions, and for publishing
activities. Moreover it has to be noted that data are more likely to be available when the phenomena involved are in some way formal and commercial. In the case of energy in the Sahel this often does not comprehend, or comprehend in limited way, the traditional biomass sector, on majority informal and even if the largest in the countries under investigation. Anyway thanks to the renewed attention to the link between energy and poverty, particularly after the 2002 Johannesburg Conference, data on energy policies, consumption and production are now included often in the poverty and MDG reports, and in other reports of international, regional or national projects that have been highly utilized for this study.

5. Brief global policy overview

Regulation and policies in the energy sector.

5.1 The first shift in policies, from state monopoly to the market based reforms

The region under study is very wide and present huge disparities, from the economic, social and environmental point of view, but also many common characteristics. The nine States of Burkina Faso, Cape Verde, Chad, Guinea Bissau, Mali, Mauritania, Niger Senegal and the Gambia all belong to the UN list of Least Developed Countries (LDCs) and to the group of 30 Countries with lowest Human Development Index HDI, with the exception of Cape Verde. From the political point of view they all got independence from European countries (UK, Portugal and France) in a period between the 1960 (for the countries occupied by the French) to mid-seventies (for the countries occupied by Portugal and decolonised after the Carnation Revolution).

More specifically for the energy sector all countries present a very high share of traditional biomass in the total energy mix (for Chad, Mali, Burkina Faso and Niger the share is higher than 85%), low electricity consumption and low electrification rates, especially but not limited to rural areas.

From the regulatory and policy point of view, specifically for the electricity sector, we may notice a common path that starts with nationalisation and vertical integration of the electricity industries in the ‘60s and ‘70s, in same cases together with the integration between the energy and water utilities. The performance of the nationalised energy companies have not always been satisfactory for many aspects and worsened during the ‘80s. The main common issues included low quality and low reliability of the service, huge
costs for the state budget, difficulties in expanding the access, inefficiency of the management and of whole structure and lack of funds and conditions to implement policies aimed to expand and improve the service.

In the 90’s, for all these reasons and also for the different climate in world politics and economical mainstream culture, all developing countries started a wave of liberalisations, structural adjustments, return where possible to free markets and a general "diet" of the functions of the state, with the support of the Bretton Wood institutions, this process happened also in the Sahel. For the Energy Sector the cornerstone of this shift in policies was a World Bank document of 1993\(^2\) that claimed for World Bank Support for the following measures:

- Institution of transparent and independent regulatory system
- Importation of services in some LDCs, for example with contract management solutions
- Commercialisation, Corporatization and involvement of the private sector (to be pursued aggressively).
- Committed lending (to the reform and restructuring objectives)
- Measures to involve the private sector participation

These new policy objectives represented a great shift from the previous policy to support state-owned monopoly. The model that the World Bank advocated for reforming the power sector in developing countries was a move in the direction of what is called an open competitive system, and was implemented with various degrees and success also in the Sahelian countries during the ’90s. It has to be noted that this model has been introduced in the 90’s in both OECD and non-OECD countries and that even in the industrialised world the model has been applied with various level of private sector participation and with various degrees of vertical fragmentation of the state monopoly enterprises.

5.2. The second shift in policies, from market reforms to the energy needs of the poor.

The nineties have been a decade in which the policy focus concentrated on structural adjustments, privatizations and free market, but the orientation of the international community switched again with the new Millennium. During the Nineties a growing concern was showed about the relationship between environment and poverty, the concept

of sustainable development was widely used (and abused) and to the relationship between energy and poverty was given more and more importance in development policies. Moreover, the policies pursued by the Bretton Wood Institutions and by the main international donors moved from the strict structural adjustment policies and refocused on poverty reduction strategies.

The integration of these concepts into development policies and the importance of energy in the poverty reduction strategies have been fully developed only after the year 2000. In particular it could be noted that the relation between energy, poverty reduction and sustainable development was not fully addressed at the Rio Conference in 1992 and not considered to be part of the Millenium Development Goals (even if several African Countries actively advocated for the inclusion of an energy access target into the MDGs). Starting with the 9th session of the Commission on Sustainable Development of the United Nations (2000) energy entered officially into the strategy to combat poverty. Following the progress made into CSD 9, the NEPAD in 2001 stressed the importance of an energy strategy to combat poverty (see later) and the World Summit on Sustainable Development (Rio +10) produced a Johannesburg Action Plan in which energy was one of the pillars. More recently, in 2004, the Bonn declaration reaffirmed the centrality of energy to reach the MDGs and the UN founded UN-Energy, an inter-agency with the specific role of coordinating the role of the UN agencies in the field of energy. Again, in 2006 and 2007, the 14th and 15th session of the UN Commission on Sustainable Development had - again - the relation between energy and poverty at the centre of its works.

During the last years energy has become, from an issue ignored in the Millennium Development Goals, to an obligatory step to achieve MDGs. There has been the development of the concept that a certain amount of energy services are necessary to reach the MDGs, and several attempts have been made to identify the energy targets for the MDGs. This conceptual step has been developed, between the others, in a meeting of experts in the framework of the Millennium Project, in New York, in 2001, that proposed three energy targets for the MDGs:

3. Energy Services for the Millenium Development Goals: Millenium project, UNDP, World Bank, 2005

- for domestic energy: to assure that 50% of the ones that do not have access today to modern energy, gain this access by 2015 and also the provision of ameliorated cookstoves;

- 100% of urban and periurban population to reach access to electricity;

- 100% of villages with some form of mechanic or electric energy

These recommendations have been in certain degrees followed by regional and national institution in fixing their own energy targets. The concept that to achieve the MDGs an
energy strategy is necessary has become more and more universally accepted. Nevertheless, the majority of national Poverty Reduction Strategy Papers still deal with energy only from an infrastructural or environmental point of view and do not consider the problem of the energy needs of the poor, of the effects of the reform in energy sector on the poor, and therefore do not allocate resources for energy-poverty strategy in their budget commitments.

5.3 The African policy initiatives

In the African continent in the last years there have been several policy initiatives, cooperation programs, policy declarations and real projects to face the energy situation of Africa, at the global level and for the specific sub-regions of the continent. Here it follows a list of the principal policy agreements and initiatives subscribed by the African states and specifically for the Sahelian States.

5.3.1 The NEPAD energy agenda

The New Partnership for Africa’s Development (NEPAD) is an initiative adopted by the summit of the head of state of Organization for the African Union (OAU, now African Union) in 2001. NEPAD objectives are to reduce the poverty, promote sustainable development, to halt the marginalisation of Africa in the process of globalisation and to accelerate the empowerment of women. NEPAD is an holistic programme that covers many issues, starting from good governance, peace and security, capacity building, financing, infrastructure etc. It is intended to be a process that is driven by the Africans and achieved also with the support of international donors. The NEPAD framework document includes a section on energy with the following objectives:

- To increase Africans’ access to reliable and affordable commercial energy supply from 10 to 35 per cent or more within 20 years; ·

- To improve the reliability and lower cost of energy supply to productive activities in order to enable economic growth of 6 per cent per annum; ·

- To rationalize the territorial distribution of existing and unevenly allocated energy resources; · To strive to develop the abundant solar resources; ·

- To reverse environmental degradation that is associated with the use of traditional fuels in rural areas; ·
- To exploit and develop the hydropower potential of the river basins of Africa;
- To integrate and transmission grids and gas pipelines so as to facilitate cross-border energy flows; · To reform and harmonise petroleum regulations and legislation on the continent.

One of the action indicated in the document is to create an **African Forum for Utility Regulation**. Energy related projects in the NEPAD framework are especially related to the modernization of infrastructures.

### 5.3.2 The African Energy Commission - AFREC

In 1980 in Lagos (Nigeria) the African Head of State of the OAU (Organization for the African Unity) adopted a Lagos Plan of Action and recommended the creation of an African Energy Commission. The recommendation was not implemented immediately and was reaffirmed in several meetings and declarations throughout the nineties. In July 2001, in Algiers, the African Ministers of Energy met and adopted a declaration creating the African Energy Commission, with headquarters in Algiers. The declaration was signed by 37 African states, but only ratified by eleven. It is stated that to enter into force the convention should be ratified by at least 15 African States. In the Sahel region the only Mali and Senegal have ratified.

The commission, when and if it will be fully operative, will have between her duties to map out the energy development policies, strategies and plans based on sub-regional, regional and continental development priorities and recommend their implementation and design, create and up date an energy continental data base and facilitate rapid dissemination of information and exchange of information among Member States, as well as among the Regional Economic Communities (RECs), plus various harmonization, advice, capacity building and seek for financing activities. Part of these activities already started with the support of the World Energy Council WEC and the International Energy Agency IEA that made some efforts to create an **African Energy Information System AEIF**.

### 5.3.3 The Forum of Energy Ministers of Africa - FEMA

On the 3rd of August 2005 the Energy Ministers of African States established a **Forum of Energy Ministers of Africa (FEMA)** with headquarters in Kampala, Uganda. The vision of the forum is to achieve effective African and regional cooperation, social and economic development leading to poverty eradication in Africa through the promotion of environmentally sustainable use and management of energy resources.
Key objectives of FEMA are:

- Raising the profile of the energy sector in national and regional planning to reflect its central role in achieving the Millennium Development Goals.

- Developing a coherent energy strategy for Africa, including re-strategizing in order to increase modern energy supply and access.

- Promoting a common approach expressed through specific, national and regional projects of benefit to African countries.

- Speaking with a common voice and collectively advocating for the financing of regional projects.

- Promoting interconnectivity, and developing common technical standards and codes of conduct.

Fema interim Secretariat is hosted by the Ugandan Minister of Energy (and chaired by the Ugandan Minister), it already received support both from ESMAP and GTZ (the German technical cooperation) and it is designed on the basis of the previouses successful experiences of other African Forums, like the African Ministerial Conference on the Environment, (AMCEN) operational since 1985 and the African Ministerial Council on Water (AMCOW) from 2002.

The Forum of Energy Ministers shall meet every two years, while the steering committee has an annual meeting schedule.

In order to achieve its objectives and the Millenium Development goals, the FEMA proposed to fulfill the following energy targets:

- doubling the consumption of modern fuels

- 50% of inhabitants in rural areas should use modern fuels for cooking

- 75% of the poor in urban and peri urban areas should have access to modern energy services

- 75% of schools clinics and community centers should have access to electricity as this would enhance their competitiveness

- Motive power should be available to rural areas.

Financing needs to achieve these goals are huge, for the electricity sector only it is estimated an annual requirement of 4 USD billions for operation and infrastructure plus an addititional 4,8 USD billions to provide electricity to 150 additional millions of people in SSA.
The FEMA is expected to complement and collaborate with AFREC once this will be fully operative.

More specifically for the Sahel region, the most important policy steps in the field of energy have been carried out in the framework of two organizations that comprehend the majority of the States of the region under study. The UEMOA and the ECOWAS. Here it follows a brief list of the principal regional energy policies and initiatives in ECOWAS/UEMOA member states

5.3.4 The Common Energy Policy - La Politique Energetique Commune (PEC)

In 2001 the states of UEMOA adopted an ENERGY Common Policy with the objectives of
- to put in place an integrated energy planning system
- to promote renewable energies
- accelerate the interconnection of energy systems in collaboration with the ECOWAS

5.3.5 The WEST AFRICAN Power Pool

The institution of a West African Power Pool - WAPP was decided by ECOWAS members in 1999 with the objective of multiply by four the interconnection capacity between member states for the period 2005-2020. The WAPP project is to extend for more than 5600 km the interconnection lines between Nigeria, Benin, Togo, Ghana, Ivory Cost, Niger, Burkina Faso and Mali) with investment to be realised for about 11,8 billions of dollars in 19 years. The objective is to reach, for the ecowas region, a capacity of 17000MW of installed capacity in order to satisfy the planned demand for the year 2023.

5.3.6 The ECOWAS energy protocol

4 The UEMOA is the West African Economic and Monetary Union or Union économique et monétaire ouest-africaine in French and comprehends Benin, Burkina Faso, Côte d’Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo.
5 ECOWAS is the Economic Community of West African States and comprehend Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.
The ECOWAS ENERGY PROTOCOL is a legal text formalising the juridical framework of enterprises in the energy sector, and has been designed as a guarantee for the foreign direct investments in the energy sector. The adoption and ratification of this convention is an eligibility criteria to have access to the World Bank Facility for the WAPP.

5.3.7 Interstate natural resources management OMVS, ABN, OMVG

There already exist sub regional institutions created in order to manage water and energy resources. The Organisation pour la Mise en Valeur du fleuve Sénégal OMVS, manage the Manantali dam and shares resources between Mali, Sénégal and Mauritanie. The Organisation pour la mise en valeur du fleuve Gambie OMVG and the Autorite du Bassin Du Niger ABN also are other examples of interstate cooperation in the field of natural resources.

5.3.8 The ECOWAS / UEMOA initiative and the White Book for a Regional Policy

The most ambitious regional project in the field of energy is summarised in the “white book for a regional policy”. Following the engagements taken by NEPAD and later by the Summit of African Energy Ministers at FEMA in 2005, the 29th Conference of the Head of State of ECOWAS/UEMOA in Niamey on the 12th of January 2006 with the decision A/DEC.24/01/06 adopted an ECOWAS/UEMOA regional policy on access to energy services for populations on rural and peri-urban areas for poverty reduction in line with achieving the MDGs in Member States. The policy objectives and the accompanying white book guidelines are very ambitius and call for:

- One global objective:

  Increase Access to modern energy services of rural and periurban populations, to provide by 2015, access to modern energy services to **at least half** the populations living in rural and periurban areas. This entails multiplying by four the number of people with access to modern energy services in comparison to 2005. This also entails supplying 36 million more households and 49 000 more localities with Access to Energy Services.

- Three Specific Objectives:
[1] To strengthen regional integration by pooling knowledge of good practices, exchanging experiences, adopting a regional information system and developing cross-border co-operation, with a view to fostering development and building capacities.

[2] To help harmonise political and institutional frameworks (i.e. PRSPs, MDG monitoring framework, etc.), in taking into account essential role energy services play in boosting human development and achieving the MDGs.

[3] To develop, on the basis of national political frameworks, coherent energy policies based on reducing poverty in rural and peri-urban areas and achieving the MDGs. The energy programmes will focus in particular on: • Stimulating productive activities, especially those related to processing and added value to agricultural produce, • Modernising basic social services (healthcare, education, water, etc.) and improving living conditions, • Improving the situation of women, who are disproportionately, affected by all aspects of poverty, most particularly health problems (arising from the difficulty of chores such as wood-gathering and water-drawing, etc.).

- Three targets

[1] 100% of the total populations or 325 million people, will have access to a modern cooking fuel;

[2] At least 60% of people living in rural areas will have access to productive energy services in villages, in particular motive power to boost the productivity of economic activities;

[3] 66% of the population, or 214 million people, will have access to an individual electricity supply, or: (a) 100% of urban and peri-urban areas; (b) 36% of rural populations; (c) Moreover, 60% of the rural population will live in localities with (i) modernised basic social services – healthcare, drinking water, communication, lighting, etc. (ii) access to lighting, audiovisual and telecommunications service, etc. and (iii) the coverage of isolated populations with decentralised approaches.

The document states also that the actions should conform to several guiding principles and between them we may mention: subsidiarity, participatory approach, cohesion, consultation and co-operation, multisectorial approach, technological neutrality, public-private partnerships, sustainable development, gender equity, security of supply, optimisation and raising of current financial resources.

The White Book not only affirms the link between the provision of energy services and the achieving of the Millenium Development Goals but also makes an action plan, a cost estimation of the action that have to be taken in order to reach its ambitious objectives.

The implementation of the regional UEMOA/ECOWAS energy policy is led by a steering committee comprhending:

- the ECOWAS/UEMOA Technical Secretariat
- The ECOWAS/UEMOA Energy Committee
- the regional multi-sectorial committee
- representative of civil society
- donors.

The political level coordination is to be held by an annual **Regional Forum of Acess to Energy in ECOWAS Countries** attended at ministerial level. A high profile annual meeting is considered of an extreme importance for the visibility of the sector, experience sharing and political guidance.

The implementation work has to be done by a dedicated permanent **Regional Agency for Access to Energy Services** with operational autonomy. This Agency, whose legal status has to be negotiated between member states, would be after a first initial period, financially autonomous through a levy on the additional investments that it would be able to mobilize and its functions would be revised on a 5 to 5 year basis.

Finally the total **costs and the investments** estimated by the UEMOA/ECOWAS white book are the following:

- 17.5 billions of dollars over ten years for investment in equipment, studies and accompanying measures.
- 34.6 billions of dollars over ten years for energy costs
- the total cost is estimated to be 5.2 USD billions each year, that is about 4.6% of regional GDP and 16 USD per year per inhabitant.

These costs appear very high, but it has to be reminded that the above figures include the whole cost of the investment, studies and consumption of energy in the entire region.

The **ECOWAS/UEMOA Regional Action Plan** is the action plan designed to start this process and mobilize further investments, its cost is estimated to be of 248 USD millions over ten years, subdivised in the following action lines:

- capacity building for private and public actors - 83.1 USD millions - including 34.8 USD millions for feasibility studies
- support to fund mobilization - 121.2 USD millions - including 90 USD millions for 200 demonstration projects.
- promotion and dissemination of experiences - 15.6 USD millions
- promotion of local production of energy service equipment - 12 USD millions
- preparatory activities and operation of the energy - 16.8 USD millions. The regional agency for the promotion of energy access is estimated to have an annual cost of 1 USD million.

### Energy Targets for achieving the Millennium Development Goals 2015.

<table>
<thead>
<tr>
<th>Area</th>
<th>UN Millennium Project</th>
<th>FEMA</th>
<th>ECOWAS/UEMOA white paper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>MDG 2015</td>
<td>MDG 2015</td>
<td>MDG 2015</td>
</tr>
<tr>
<td><strong>Domestic Energy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% of the ones that today do not have access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% of Rural habitants with modern fuels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100% with modern cooking fuels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Urban and PeriUrban Population</strong></td>
<td>100% with electricity access</td>
<td>75% with modern energies</td>
<td>100% with access to electricity</td>
</tr>
<tr>
<td><strong>Villages</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100% with mechanic or electrical power</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motive powers &quot;available&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60% with access to motive energy in villages, 36% with access to electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75% of school and clinics with electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60% of the population living in localities with energy powered healthcare, drinking water, telecommunications..</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
6. The energy sector in the Sahel

Sahelian Countries presents huge disparities and common issues. All the countries have as policy priorities poverty reduction and economic development: the relation between these objectives and the provision of reliable and affordable energy services is strong and evident.

The majority of the population in almost all the countries heavily relies on traditional biomass to satisfy its energy needs, with a percentage in some cases higher than 80% of the total energy use, with severe adverse effects on the environment. The Electricity consumption is the lowest in the world and in some cases has not significantly improved between 1980 and 2003.

Table xxx: Basic Energy Indicators

<table>
<thead>
<tr>
<th>HDI Rank</th>
<th>Country</th>
<th>Tradition fuel consumption (% of energy requirements)</th>
<th>Electricity consumption per capita (kWh)</th>
<th>CO2 Emissions Per capita (mt)</th>
<th>Ratification of international treaties</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>Cape Verde</td>
<td>55</td>
<td>0.0</td>
<td>100</td>
<td>0.4</td>
</tr>
<tr>
<td>153</td>
<td>Mauritania</td>
<td>60</td>
<td>60</td>
<td>0.4</td>
<td>0.9</td>
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<tr>
<td>155</td>
<td>Gambia</td>
<td>70</td>
<td>101</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>156</td>
<td>Senegal</td>
<td>115</td>
<td>192</td>
<td>0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>171</td>
<td>Chad</td>
<td>10</td>
<td>11</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>173</td>
<td>Guinea Bissau</td>
<td>18</td>
<td>45</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>174</td>
<td>Burkina Faso</td>
<td>16</td>
<td>32</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>175</td>
<td>Mali</td>
<td>15</td>
<td>38</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>177</td>
<td>Niger</td>
<td>85.6</td>
<td>40</td>
<td>0.1</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Data are estimated produced by the United Nations Department of Economic and Social Affairs, Statistics Division.

✓ ratification, acceptance, approval, accession or succession

(Source: Human Development Report UNDP 2006)

The high dependence on traditional energy is caused both by an infrastructure issue, with the insufficient production capacity, low reliability and extension of the energy distribution network, and also by an economic issue, as modern energy services when available may be too expensive for the poor. The price and availability of modern energy services highly affects also the development of any economic activities and so of the effectiveness of the

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6 The Human Development Index is a measure of socio-economic parameters such as life expectancy, income and educational achievement.
strategies to reduce the poverty. Costs are even higher when we consider the necessity of using self-generation in any situation in which the consistency of supply is critical. At the national level, the high dependency of imported fossil fuels is among the most important expenses in foreign currencies and represent a considerable part of all export revenues. International price shocks in fossil fuels highly affect trade balances, state budget and street prices.

Most of the countries have undergone several political actions and reforms on the energy sector, at national or regional level, and some countries inserted energy issues in their poverty reduction strategies.

6.1 Analysis methodology

For each country and at the regional level there have been analysed the following aspects. The analysis is made on various literature sources and with direct confrontation with local stakeholders. It is divided in the following sub chapters:

1. General principles / macro policies
   
   In this section what are the general principles of the Energy policies are analysed

2. Public Institutions

   It is a list of the main institutions regulating the sector with their respective roles and responsibilities

3. Electricity Sector

   In this section the rules and the policies of the electricity sector are analysed and their recent developments. In particular the following points are analysed:

   a. Structure of the Electricity Sector
      
      Vertical and horizontal structure, and reforms.

   b. Ownership of the electricity industry
      
      Public ownership and the privatizations

   c. Regulation of the electricity industry
      
      Regulatory bodies.

4. Forestry / Biomass Energy

   In this section is analysed the presence of forestry policies and biomass energy policies, eventually linked with policies to combat desertification
5. Fossil Fuels

*In this section the principal policies for petroleum, gasoline, natural gas, including subsidies are analysed*

6. Energy Poverty Initiatives

*In this section it is analysed the presence of specific pro-poor measures, either the presence of the energy needs of the poor in the PRSP policies, or specific plans to improve access and rural electrification*

   a. Energy and the PRSP
   
   b. Energy Access Policies

7. Other policies
7. Regional Analysis

7.1 General principles / macro policies

The Regional Energy Policy varies from country to country, but there are some aspects that can be encountered almost anywhere in the region:

1) **Fight to desertification.** Desertification is one of the most serious problems Sahelian countries face and is caused by both climate change and unsustainable land use, either for disruptive agricultural practices and for the pression of the population on the environment. Unsustainable fuelwood collection can seriously affect the environment and encourage desertification, thus any policies aimed either rationalising the exploitation of fuelwood resources or to decrease the fuelwood consumption through fuel substitution and efficient cookstoves can contribute to the fight to desertification. So in the region there are various examples of policies like the promotion of natural gas (Senegal), the valorisation of Forestry Resources (The Gambia, Mali, Burkina Faso), rural electrifications (everywhere, but with different degrees of achievement)

2) **The privatization of national electric utilities** has been tempted everywhere. This policy has been advocated by World Bank /IMF as part of the economic reforms linked to structural adjustmanent plans and to PRSP. While the privatization of other parastatal industries, including some in the energy sector, has been achieved in many cases, the privatization of the electricity sector proved much more difficult, due to the particular nature of this industry. While several regulatory reforms have been implemented in many countries, adopting new electricity laws, establishing independent regulatory bodies anjd defining roles and responsibilities of the state and of the electricity enterprise, the process of privatization generally failed everywhere, the states that went ahead with privatizations (Cape Verde, Senegal, Chad and Mali) returned on their steps after a short period of time, while the others did not found any interested buyer.

3) **Development of fossil fuel reserves** has been pursued everywhere these where available and economically recoverable. Oil fields have started their activities in Mauritania and Chad. The development of fossil fuels resources might have severe impacts on the environment and on the local population, and so its link with poverty reduction has been questioned by many, including the Extractive Industries Review of the World Bank. The use of the oil revenues, the respect for human rights and the environment and the principle of
compensation of affected communities have been accepted as standard for international WB funding of these kinds of projects.

4) **Regional Integration** is becoming year after year stronger. The integration has various forms, like the large project of regional network interconnection of the West Africa Power Pool, the transnational connections of many villages that are located near the border of the states, the management of important Hydroelectric resources on the rivers Senegal, Niger and Volta. The regional integration is also enforced by the numerous intra-regional seminars, conferences and experience exchanges that have characterized the last years.

### 7.2 Public Institutions

The energy reforms started in all the countries have modified also the public institution dealing with energy. The role of the state is still predominant but side of the traditional Energy Minister, other bodies have appeared in the sector, like independent regulatory agencies that in some cases regulate both the electricity sector and other sectors (see later point xxx).

In the majority of the cases the public enterprises have been corporized and have assumed the form and the rules of private societies, with the shares in the hands of the state or privatized.

### 7.3 Electricity Sector

The electrification rate in Sahelian Countries is very low, especially in rural areas where most of the times there is no infrastructure at all. In urban areas the electrification levels can be also very low levels (Niger 9%, Mali 12%).

Electricity consumption per capita is generally very low but growing, and production is not able to satisfy demand in most of the cases, with resulting low reliability of the service and need for additional investment to raise production capacity and reduce the system losses. The electricity sector is in the difficult situation of needing consistent investment in infrastructures but with uncertain returns, due to the low power consumption and the difficulties and adverse effects of raising tariffs after a certain level. State owned utilities often have not excelled in transparency of the budget, and relied heavily on the state for the repayment of the passivity: the state itself is the first client of the electric industry but not always the best.
To face all those issues, a number of policy reforms have been undergone in the energy sector in the Sahel in three directions, regulation, ownership and structure.

7.3.1 Structure of the electricity sector

The process of reforms did not only concerned privatisation but also the vertical and horizontal structure of the societies.

Given that the electricity systems could be broadly divided in 4 groups:

1. Monopoly - One utility handles generation, transmission and distribution;
2. Purchasing agency - Independent Power Producers (IPPs) sell electricity to a single buyer that handles transmission and distribution;
3. Wholesale competition - Different distribution companies may buy electricity directly from generators and have it delivered to their area under open access arrangements with the transmission entity;
4. Retail competition - Allows all customers to choose their electricity suppliers.

The reforms designed a path to move from model 1 to model 2 or 3.

The changes in the structure however have not been radical, and most of the countries still conserve a vertical integrated company handling generation, transmission and distribution in the whole country, being so very far from the multi player competitive market established in other developing countries.

The most important vertical innovation has been the introduction of Independent Power Producers - IPPs - to address quickly the lack of production capacity. IPPs are already producing a large part of electricity in Senegal (and in many other African countries) and are foreseen from the new electricity acts in other Sahelian countries. The Energy produced by IPPs is then self-used and/or resold to the national utility that acts as a single buyer.

Horizontally the main innovation has been, in some cases, the provision of concession for areas not yet served by the main enterprise to smaller local societies. In Burkina Faso and Senegal the law allows independent generation and distribution in the zones not yet served, in Mali there exists two Decentralised Services Societies and in Niger SONICCHAR produce electricity mainly for the uranium mines and partially also for the state owned utility NIGELEC. Anyway the process has not been homogeneous. In Cape Verde, for example, there has been a process of horizontal integration between ELECTRA and the municipalities’ utilities that were serving water and electricity in various islands. Between 1998 and 2004,
due to these merges, the number of employees of ELECTRA nearly doubled, and the number of clients for water and energy more than doubled.

7.2.2 Ownership of the electricity industry

In the mid of the nineties the energy sector in all the countries under study was dominated by the State. Electricity was provided either by private, but state controlled, enterprises or directly by a specific state department. All the states anyway started a process of corporization and privatization of the public owned energy enterprises, lead by the IMF/World Bank. The process encountered many difficulties, from the lack of interest from foreign investors, from not so committed to privatisation governments, to serious incomprehensions and conflit between the state and the privatized enterprises, that eventually led the State to re-acquire the shares sold just few years before.

• In Burkina Faso a law of 1998\textsuperscript{7} has specified that the private sector should oversee production, transmission and distribution of electricity. In 2006 a decree\textsuperscript{8} plans privatize Sonabel (Société National Burkinabé d’électricité) and end its monopoly.

• In Cape Verde, at the end of 1999 51\% of Electra SARL was sold to a Portuguese consortium of the (public controlled) Portuguese utilities of water and electricity. After serious disagreements between the government and the management of privatized Electra, over tariff readjustment and investment plans, serious black-outs affected the capital Praia and other zones of the country starting from September 2005. In summer 2006, after an agreement between the prime ministers of Cape Verde and Portugal, the majority of stock of Electra returned under the control of the Government of Cape Verde.

• In Chad in 2000 the STEE (Société Tchadienne d’eau e d’électricité) was started to be managed by Veolia (ex Vivendi environment) as a first step of the privatization process. In March 2004 Veolia resigned from the contract and the privatization process has been frozen.

• In Guinea Bissau the government expressed is intention to reform the energy sector and opening financial bids for a long-term leasing contract for EAGB (Electricidade e

\textsuperscript{7} Law 60/98/A Burkina Faso
\textsuperscript{8} 2006/28 Burkina Faso
Agua Guinea Bissau). The commitment were in a letter of intent and memorandum of understanding with the IMF in November 2000. The same commitments were re-expressed in July 2006.

- In Mali 1n 1995 EDM (Electricité du Mali) delegated its management to an external consortium, composed of SAUR International, Hydro-Quebec, EDF, and CRC SOGEMA. In 1998 due to unsatisfactory performances the contract management ended. In 2000 the government made shares available to the public (and the society was recapitalised from 4.7 USD millions to 60.2 USD millions). In 2002 the company shares distribution were the following 40% for the government and 60% for the group SAUR/IPS - West Africa. The concession contract for EDM SA covers 97 localities for 20 years. EDM committed to invest 140 USD millions in the first three years. Hydroelectric facilities remain in the ownership of the state. In October 2005 Saur International decided to withdraw from EDM for unresolved differences with the government (especially about tariffs). After this decision the stock of EDM is now owned for the 66% by the state and for the remaining 34% by IPS.

- In Mauritania the government committed itself to privatize the power and electricity utility SOMELEC (Société Mauritanienne d’électricité) with the World Bank and IMF. In 2002 the government declared that the privatization of SOMELEC could not be completed on time due to technical factors and factors outside the control of the government. The idea of privatizing SOMELEC has been later abandoned (Mauritania PRSP, 2007).

- In Niger the privatization of the electric utility NIGELEC was foreseen by the Enhanced Structural Adjustment Plan back in 1996. The original plan was to privatize the company in the period 1997-1999 but this proved unfeasible. At present the privatization of NIGELEC has been delayed mainly due to the difficulty in finding private companies ready to invest US$60-100 million required for expansion and rehabilitation of the power system. (IMF art.4 consultation report, jan 2007).

- In Senegal in 1998 the energy sector was started to be reformed with two acts (98-29 and 98-06) that transformed SENELEC in a stock company and created a Regulatory

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Commission of the Electricity Sector (CRSE). In 1999 through a tender process the shares of SENELEC have been divided in: 41% the State, 10% Company employees, 15% floating on the local stock exchange (Bourse Regional des Valeurs Mobilières) and 34% to a consortium of Hydro-Quebec (Canada) and Elyo (France) the latter being a subsidiary of Suez Lyonnaise des Eaux. The Consortium however gained full management control. In September 2000 the State re-acquired the shares of the consortium as it was not able to increase the generation capacity as specified in the contract. After while a second tender was issued and two companies were short-listed, Vivendi International (France) and AES (USA) but the necessary agreement was not concluded, due to the financial difficulties of the two companies. In August 2002 the Government of Senegal halted the process of privatization.

• In The Gambia the government set up a Gambia Divestiture Agency back in 2001 to dismiss state participation in several enterprises, between them also The National Water and Electricity Company NAWEC, whose ownership is at 97% owned by the government. In 2007 the company still is state owned and no significant progress has been made on this agenda.

The difficulties have risen in particular by two factors, either the lack of investors / buyers, or a bad relationship with the buyers and investors. The first barrier is is mainly caused the bad economic conditions of the state controlled electric utilities, the huge need of investment, the political instability and - in general - by the uncertainty of the return on the investment. The second barrier is a consequence of the conflit on tariff and contractual obligations between the state and the energy utilities, mainly this is a consequence of a non clear definition between the role of the state and the role of the private entreprise, and a conflict between a market and a social policy of energy. In both cases anyway demonstrate that the tentative of igniting the power sector in Sahel with private investments revealed - till now - unsuccessful.

7.3.3 Regulation of the electricity sector

The reform process changed the regulation of the electricity sectors in many ways. In most of the cases a new electricity act has been approved by the parliament, defining the entities responsible for regulations, the role of the state, of the private sectors and the rights of the clients. One of the most delicate issues to be regulated is the electricity tariffs and their
adjustments, as the cases of Cape Verde and Mali clearly demonstrate. Tariffs freezing or even reductions might be used as a policy measure to mitigate prices and obtain consensus, but these measures seriously undermine the financial stability of the energy utilities. On the other hand it is true that a raise of the tariffs, a part for being highly unpopular and for having adverse effects on the economy, is difficult due to justify with the actual low quality of the services, even with the good reason that the raise of the tariffs is necessary to make the investments for improving the quality in the future or, simply, to cope with the raise in fossil fuels.

Before the reform in all countries the rules of the game were decided by the competent ministry of energy and applied directly to the state owned utility. This is still the case in many countries, however the ones that advanced more in the process of reform established specific Regulatory Agencies. This is the case of Cape Verde (that established an Economic Regulatory Agency), of the Gambia (Public Utilities Authority), of Mali (Water and Electricity Regulation Commission), of Niger (Multisectorial Regulation Authority) and of Senegal (Regulatory Commission of the Electricity Sector). The role of the State, the degrees of power and independence of the different Regulatory bodies vary from state to state and the most positive experiences, by many observers, belongs to the regulatory agencies that cover more than one sector.

In all the other countries (Burkina Faso, Chad, Guinea Bissau and Mauritania) the sector is directly regulated by the Government through the Minister of Energy.

7.4 Forestry and Biomass

As traditional fuelwood is the most used energy source in the region, the sustainable management of the forestry resources is crucial for each country to limit the desertification process, protect the environment and ensure a durable and rationale use of the resources. Several countries adopted specific codes to regulate what kind of forest resources may be cut, how much and by whom. For example in Gambia and in Mali reforms have been carried out in the direction of a decentralised use and control of the resources, promoting community management and sustainable use, incentivating more professionalism in the sector and establishing local markets. In Senegal the LPG program highly reduced the consumption of fuelwood for cooking, and the pressure on local forests. Burkina Faso also recently implemented a new forestry act. Forestry degradation can be also reduced by a more rationale and efficient utilisation of the available collected biomass, through the
implementation and diffusion of improved cookstoves that seriously diminish the quantity of wood necessary to cook each meal.

In the region there are several programmes and projects dedicated to the conservation of the forestry resources through a better management and a lower consumption. One of the most important programmes is the PREDAAS that dedicated a lot of efforts to the promotion of policies for the sustainable use of fuelwood resources all along the region.

7.5 The Fossil Fuel Sector

In the region under examination only Chad and Mauritania produce fossil fuels, but exploration is underway in other countries. In Chad in 2003 a pipeline linking the oil fields in the south of the country to the sea terminal in Cameroon was inaugurated. The 4.1 USD billion project was almost entirely financed by the oil companies, but the support of the World Bank was considered essential to assure the right political conditions. The Bank therefore supported the project and assured a financing of 90 USD millions to the two governments, on the basis of a Petroleum Revenue Management Program that should have assured that a consistent part of oil revenues would have been spent in poverty reduction strategy. However at the end of 2005 Chad government modified the law managing the distribution of oil revenues and the Bank subsequently suspended all loans and grants to Chad until a new agreement on the oil revenues has been signed after several months of negotiations.

Senegal is the only country in the region that carried out, since the seventies, a comprehensive strategy to favour the penetration of GPL in the country. With public investments in infrastructure and several subsidies, now progressively phased out, the country has been particularly successful in this field. Dakar is the city of the region with major penetration of GPL for house cooking, and also the other urban centers present much higher levels than neighbouring countries. At present in Senegal there is a large and well-established market, and production facilities able to serve also neighbouring countries.

7.6 Energy-poority Initiatives.

Energy is not present in all the Poverty Reduction Strategy in the same way. Some countries present detailed energy-poority action plan, with budgetary resources allocated, while others take into account energy only as a factor of production to be assured in a reliable way
and at a competitive price. In Burkina Faso the 2004-2006 strategy extensively deal with energy and a intersectorial committee to deal with energy poverty has been created, in Mauritania there exist a National Energy and Poverty Reduction Strategy, in Senegal Multi Sectorial Energy Projects (PREMS) have been launched, in Mali there exist several projects dedicated to this issue and budgetary resources allocated, as well in Niger energy is in the PRSP related development budget. The other countries however do not specifically presented measures to increase the access to modern energy services for the poor.

7.6.1 Rural electrification agencies / Social Access policies

In rural areas, modern energy services are inaccessible in most of the cases, and specific programs are being implemented in many countries to address this situation. The rural electrification strategies are of two types: centralised and decentralised and their financing is made by cross-subsidies or by direct financing by the State or by the donors.

A Rural Electrification fund is foreseen in Burkina Faso and in Niger (financed through a levy on each kWh sold), while in Mali, in Mauritania and Senegal a specific agency has been already established. In Senegal the Agence Senegalaise d’Electrification Rurale ASER has divided the country in several concession to be assigned to private companies, with 35% of the costs subsidized and another 35% by a medium or long term loan guaranteed by ASER itself. In Mali about 500 Multi-functional platforms have been installed in rural isolated villages to provide mechanical energy and electricity, generally owned and managed by women cooperatives and partially financed by the Government, UNDP and other donors.
8. National Policies
8.1 BURKINA FASO

8.1.1 General principles / macro policies.

The energy sector reform in Burkina Faso is still at the initial stages. In 2000, a new Ministry of Mines, Quarries and Energy was created with the remit to define and implement government energy policies. The government’s policy for the electricity sector in particular focuses on nationwide electrification in order to make electricity accessible to a higher number of the population and thus facilitate the development of the modern sectors of the economy. The reduction on the dependence in imported energy is also at the heart of the government policies.

The first restructuring of the electricity sector was in 1998 when the Parliament adopted the 17 December 1998 law (NO 060/98/AN) regarding the general regulation of Burkina Faso’s electricity supply. This law has the aim of satisfying two objectives including the qualitative and quantitative security in energy supply while at the same time providing the reduction of production costs and eliminating the monopoly of the sole national utility, SONABEL [see website IMF 1]

8.1.2 Public Institutions

The management and administration of the energy sector is handled by the following government institutions and departments;

The Ministry of Energy and Mines (MEM) – this was formed in 1995 with the following objectives;
8.1.2 Electricity

8.1.2.1 Structure of the electricity industry

The current structure of the electricity industry is vertically integrated with SONABEL handling generation, transmission and distribution. Horizontally there has been provision of concession for areas not yet served by the main enterprise to smaller local societies.

The law No. 060/98/AN predicts the end of the monopoly for generation transmission and distribution but at present only little auto-generation plants are privately owned. The government plans are to revise the law to increase liberalisation of the sector. Meanwhile, an operational plan for the development of the energy sector has been applied in 2004 and two entities have been created: a committee for the study of the reform of the sector of energy (CERE - Cellule de Reflection élargie sue la réforme du secteur de l’énergie) and a reform implementation unit (UER, Unité d’implémentation de la reforme).

SONABEL’s power system is made up of 3 subsystems;
i. The central network which supplies Ouagadougou the capital city, Koudougou and a few other communities

ii. The western region network with the city of Bobo Dioulasso as its main centre

iii. Secondary centres (about a dozen) primarily supplied by a diesel plant.

The two major cities of Ouagadougou and Bobo Dioulasso consume around 85% of the total amount of electricity distributed by SONABEL while the secondary centres together consume about 7%.[SONABEL, AFREPEN 2005].

8.1.2.2 Ownership of the electricity industry

SONABEL, the national power utility is in charge of generation, transmission and distribution of electricity. However under decree N° 2000628/PRES/PM/M the government plans to privatise it and design a new rural electrification strategy. It plans to liberalize electricity production and distribution thus opening it up for private sector participation and ending the monopoly of SONABEL.

Law No 060/98/A has specified that a private sector will oversee the production, transmission and distribution of electricity while the ownership of the assets will remain with the state. The new privatisation agenda should be completed by 2007.

8.1.2.3 Regulation of the electricity industry

Since the year 2000 the Ministry of Mines, Quarries and Energy is in charge to define and implement energy policies and regulations. Moreover the government owns and supervises SONABEL. It appoints the members of the Board of Directors, sets tariffs for the sale of electricity and approves development plans. The government also has to approve the accounts presented by the Board of Directors.

Burkina Faso has one of the highest electricity tariffs in SSA, 22.5 US cents/kWh for households on average. Nevertheless the tariff is not sufficient to repay supply costs. The government Action program for PRSP states the government intention to revise the cost structure. It has also to be noted that rural cooperatives have to buy gasoline at market price to produce electricity, while SONABEL has access to subsidies.[Ministry of Economy and Development, 2004; IMF 2005].

8.1.3 Forestry - Biomass Energy

Several programs have been put in place, in the natural management sectors. The main are:
- Agriculture Reforme (Reforme Agraire and Foncière - RAF)
- Text d’Orientation et décentralisation
- Le Code Forestier
- Le code de l’environnement

All these programs have the objective of diminishing the pressure on the environment, through responsible management of the forestry resources.

8.1.4 Fossil Fuels
There are plans to open the capital of SONABHY to the private sector and of the creation of an independent regulatory system.

8.1.5 Energy-Poverty Policies

8.1.5.1 Presence of an Energy Poverty plan in the Poverty Reduction Strategies, MDG Strategies, National Development Plan:

Burkina Faso’s PRSP lays out energy as an important factor to boost the country’s economy and also targets rural electrification including electricity provision for schools, and rural institutions. A rural electrification strategy and plan is being proposed and planned. However, evidence for indicators of performance remains to be confirmed. Apart from mention of an overall ‘rural electrification target’, there is no specific energy-poverty action plan. The original PRSP in 2000 stressed that without taking into account rent, wood was the most important expenditure item (15.1 %) in poor households. More was spent on them than for health care (14.1 %) and education (6.3 %). Priority Action Program to Implement the Poverty Reduction Strategy Paper 2004–2006 extensively deals with energy. A committee intersectorial to coordinate the action in the field of energy and poverty met for the first time in April 2005. [ Ministry of Economy and Development, 2000 and 2004; US Dept. of State website].

Specific indicators to measure the progress of the planning was however centered on generic overall targets and not specific to poverty reduction measures. The targets for biomass as an energy resource are not well encapsulated in the strategy and planning although this often is the case because of the overlap with the forestry sector as there is full acknowledgement of sustainable management of forests. The creation of a rural electrification strategy and plan is found to be crucial in terms of bringing ‘equity’ factors but there is no mention of ‘what’ the
target rates for rural electrification are, the numeric proportion of these groups, and a time frame to set these targets. The energy sector is still undergoing reform processes.

8.1.5.2 Rural Electrification Plans / Social Electricity Access plans

The Law 2005-016 divides the electricity sector into two branches, from one side the urban sector already connected to the SONABEL grid and from the other the sector of the rural decentralised electrification.

The Decentralised Rural Electrification of at least 10-15% of the rural population by 2020 is planned to be achieved through the establishment of rural electrification cooperatives, with the participation of local population and private sector, a concession period of 20 years. Decentralised Rural Electrification Cooperatives are intended for medium scale electrification. For smaller scale village applications (electrification, mechanical power and water pumping) there is growing number of Multi-functional plateforms running in the country. MFPs originally have been installed in Mali and are managed by women cooperatives.
8.2 CAPE VERDE

8.2.1 General Principles /macro policies

The general policy objectives in the energy sector, defined in the National Energy Plan for the period 2003-2012 and reaffirmed in the Growth and Poverty Reduction Strategy Paper are “to guarantee the satisfaction of the energy needs of the population, the economy and the country, making energy available in sufficient quantities and at a cost that contributes to improve the well being and the quality of life of the population and for the competitiveness of the national economy, without creating macroeconomic or environmental imbalances or else aggravate the dependence on the outside.” These general policy principles are translated in the following more specific policy objectives:

1) Consolidation of the Energy Sector in Cape Verde. on three levels:

i) structural: which implies enhancing the infrastructures for production, storage, transformation, transport and distribution of energy, so as to cover a greater area of the national territory;

ii) access: increasing the population’s access to the commercial forms of energy;

iii) institutional: creating legal conditions for the adequate operation of the sector, defining competences, endowing existing entities with means for policymaking and the adaptation of technologies, and establishing the regulatory entities;
2) **Guarantee of the Security of Supply in Cape Verde through**

i) Diversification of the energy sources, by resorting, above all, to the utilization of endogenous resources (…)

ii) of the creation and maintenance of strategic reserves (…)

3) **Guarantee of Competitiveness of the National Economy. Through the instruments at its disposal, the State may act to guarantee that the utilization of energy may become a factor in increasing the country’s competitiveness:**

i) Regulation, prices and tariffs policy;

ii) Incentive to competition, decentralized production and self-production;

iii) Incentive to limit waste and losses in the consumption of energy;

iv) Incentive to better efficiency in the energy supply systems;

4) **Minimize the environmental impact of the production, transformation and utilization of energy.**

The above quoted objectives are comprehended in the Fourth Pillar of the GPRSP - "Develop the infrastructures, promote land use planning and protect the environment." The GPRSP, do not fix any quantitative target regarding energy access, the increase of renewable energy sources, or energy savings measures, but specific targets were present in the National Energy Plan 2003-2012. The GPRSP reaffirms the role of the State in the fixation of the tariff policy and at the same time also the importance of a regulatory body and of the concurrence.

The subsequent decree 14/2006 of the 20 February 2006 explicitly reaffirms the objectives of promoting renewable, attract foreign investments, stimulate concurrence and provide a safe provision of electric energy at a fair price, without fixing any particular target.

8.2.2 **Public Institutions**

The public institutions regulating the Energy Sector in Cape Verde are the following:

- **ARE: Agencia de Regulação Económica**: ARE has been created with the decree no. 26/2003 and 27/2003. It is an independent regulatory agency with the responsibility over energy, telecommunications, water, urban and maritime transports. ARE is also responsible for tariffs fixation and realignment.
8.2.3 Electricity

8.2.3.1 Brief history of the Electricity Sector

At the time of the independence of Cape Verde (1975) electricity and water connections were very low and they were managed locally in the different islands by different entities. In thirty years there has been a progressive process that created an integrated enterprise covering the provision of electricity and in most cases also water in all the islands, Electra.

Electra was created in 1982 resulting from a merger of three players:

- Electricidade e Água do Mindelo (EAM), that by itself was the result of a previous merger between the Junta Autónoma das Instalações de Dessalinização de Água (JAIDA) and Central Eléctrica de Mindelo (CEM).
- Central Eléctrica de Praia (CEP)
- Electricidade e Água do Sal (EAS)

In 1982 Electra was responsible for the provision of electricity and desalinated water in S.Vincent e Sal, and for electricity only in the city of Praia. Ten years later the operation were extended to the island of Boavista.

In 1998 ELECTRA E.P. was transformed by law decree (n.68/98) in ELECTRA S.A.R.L. with the objective of extending the activities to all the national territory and allow privatization. The Stock of the enterprise has been divided between the state (85%) and the local municipalities (15%). ELECTRA gradually started operating into all the national territory, integrating the infrastructures and the workers of the municipalized services, and became responsible for the provision of the following services in the islands:

1. S.Vincent e (electricity and desalinated water)
2. Sal (electricity and desalinated water)
3. Santiago (electricity, water and sewage)
4. Boavista (electricity and desalinated water)
5. S.Nicolau (electricity)
6. Fogo (electricity - in Mosteiros)
7. Brava (electricity)
8. Maio (Electricity)
9. S.Antao (Electricity)

8.2.3.2 The Privatization Process

By the end of 1991, 51% of Electra S.A.R.L. has been sold for Euro 45.5 million to a Portuguese consortium formed by Energias do Portugal (EDP) 60%, and Aguas de Portugal 40% (AdP). The consortium obtained a concession for 50 years. Of the remaining stocks, the 34% remained in the hands of the Government of Cape Verde, and four municipalities held the rest. The Portuguese consortium committed to invest 65 millions of Euros in the following years.

The privatized Electra and the new management invested considerably at the beginning and their mandate, but soon problems started to rise in relation to tariff fixation and other issues and the relationships between the Cape Verde and Portuguese shareholders deteriorated quickly.

In 2001 Electra invested 2344 millions of CVE (Euro 21.2m), in particular for three power stations in Lazareto, Palmeira and Palmarejo, and for the desalination unit in Palmarejo. In that year the company registered losses for almost 987 millions of CVE (Euro 9 millions). The debts of the clients were 840 millions of CVE (Euro 7.6 million) and between them the state and the municipalities hold the most important and growing, debts. Tariffs were uniform all over the nation and stable to an average of 14.87 CVE / kWh in 2001 (Euro 0.13).

At the end of 2001, the management started to complain about the non-actualization of tariffs to cover the rise in fuel costs, and about the non-publication of the tariff for public lighting and the non extension of the water tariff to Praia.

2002 was the third year of the new management of the Electra, and of the management appointed for a three years service. During the year the new power and desalination plants entered in function and the installed capacity grew significantly (+53%), and with the integration of S.Cruz the process of national integration was completed. Tariffs remained stable during the year, albeit the fuel prices rose considerably. Electra negotiated a tariff readjustment to enter in force on the 1st Jan 2003 (resolution 43/2002 of the 30/12/2002). The Company and the State also agreed on the principle of tariff indexing, but did not produce any methodology to enact it. The President of the company wrote in the 2002 annual report that the tariff adjustment was inferior to the requests of Electra and not sufficient to put in track the company in order to have operational and financial positive results in 2004 and 2005, as originally planned.
During the year the investments reached 3948 millions of CVE (Euro 35.8 million), investments were at 87% for the energy systems and 13% for the desalination systems.

In 2002 sales grew of the 21% (as tariff remained stable, this is a pure quantitative growth) but the losses also grew and reached 1 216 millions of CVE (Euro 11 millions). The State accumulated around Euro 2 million of debt with Electra.

In 2003 an important agreement was signed between the two main shareholders of ELECTRA, the State of Cape Verde and Edp/Adp (on 17/7/2003). The agreement covered the following points:

- Necessity to recapitalize the company
- Tariff indexing linked to fuel cost
- Realisation of investments
- Fair remuneration of the capital compared to risks
- Repayment, in the timeframe of four years, of the tariff deficit accumulated between 1/1/2000 and 31/12/2002
- Necessity for the Electra to have positive results starting 2006.

An external auditing fixed the tariff deficit to 1’053’258’000 CVE (Euro 9.5 million) and the shareholders also agreed that the State of Cape Verde had to pay for the public illumination bill for the years 2000, 2001 and 2002. The total amounted to 1’143’431’000 CVE (Euro 10.3 million). Considering this value in the budget considerably improved the capital indicators of the company. Anyway at the end of the year more than the half of the initial capitalisation of the company was gone, and so according to the law it had to be recapitalized. Due to the tariff readjustment and the reduction in production costs, the losses in 2003 was 50% smaller than in the previous year, and accounted for 601’961’000 CVE (5.46 millions of Euros).

During the year the company was also internally reorganised with a stronger vertical structure, to better coordinate the activities. The year has been characterised for the first time by a positive cash flow that was anyway absorbed by the growth of the debts of the clients that reached 429 millions of CVE (Euro 3.9 million). The cost of diesel fuel used in certain power station was subsidized by the state (for 324.5 millions of CVE - 2.9 millions of EUROS). The average tariff was 17 CVE kwh.

In 2004 was a year of "managing the status quo" as the company did not find a way out to the problems accumulated in the previous year and was unable to approve the 2003 balance.
in time. The financial situation continued to improve slightly (for the second year the cash flow was positive) and the company lost less than in 2003 - (485'617'000 CVE or Euro 4.4 million) also due to a growth in sales and to a diminution of the debt of the clients. In 2004 the company was able to get paid for 96.5% of its sales, against 88.1% of the previous year. The 49% of the unpaid bills belonged to households, 20% to the private sector, 15% the State and 15% the municipalities. Investment during the year have been 426.7 millions of CVE (Euro 3.8 million), more than the half for the production of water and one third for electricity distribution.

2004 has been also the year in which the new value-added tax VAT entered into force, but the State and Electra did not find an agreement on how to incorporate VAT into Electra's factures. (VAT introduced was at 15% in all the economic transaction in the country. It has to be noted anyway that the tax on the enterprises was reduced from 35% to 30%). Diesel fuel subsidies have been 237.8 millions of CVE (2.15 millions of Euros) during the year.

In 2005, the management of the society declared that, while the shareholders did not approve the activities and investment plan proposed by the management (for the third year in a row the shareholders did not approve the business plan), the company was ruled just for the current affairs. The shareholders anyway found an agreement, with the mediation of World Bank, on the still unsolved question of the "tariff deficit for 2000-2002", because the agreement reached in 2003 was not applied yet. The company during the year was so in the condition to approve the balance for 2003 and 2004 that were still pending.

Investments in 2005 have been 150'680'000 CVE (1.36 millions of EUROS). Electra lost in 2005 539 millions of CVE (4.88 millions of EUROS) and so, at 31 December 2005, the company lost its whole initial capital, and by law, it should have been re-capitalized for an amount of at least two thirds of the original sum. The Operational Cash flow, however, maintained positive and on the same level of the previous year. Two facts externally influenced the financial results of Electra for 2005:

1. The diesel fuel subsidy was remodelled (retroactively to 2003) in order to subsidy only the rural power stations and not all of them.
2. The reimbursement from the state of the marginal losses of Electra due to the introduction of the VAT (and its inclusion in the tariff).

Starting from September 2005 Electra was not anymore able to provide an acceptable reliability of service and there were frequent black-outs.

Finally in 2006 the divergences between the shareholders, that so heavily affected the life of the privatised Electra in the previous years, come to a breaking point. During the year Electra was not able to deliver reliable service due to maintenance reasons (originated from
the precarious financial situation that blocked investments). The tariff grew of 6.5% in March, and with several announcements and regular postponements, automatic mechanism for the readjustment of tariffs was not implemented. During the year, fuel subsidies were eliminated. Daily blackouts in the capital of Praia called a response from the Prime Minister to declare “they (EDP/Adp) go away from Cape Verde as soon as possible!”

Immediately after there was a negotiation between the CV Prime Minister and the Prime Minister of Portugal and an agreement was found. The Portuguese stayed on in Cape Verde but the control share of Electra was taken back directly under the control of the government and the Portuguese consortium remained as technical partner and minority shareholder. The operation has been quite complex, involving not only the passage of 18% of the shares, but also the recapitalization of the company, the management of the debts, the cancellation of the 1999 contracts and of the future obligations. The government, reassured the International Institutions over Electra and the IMF approved the point in a note at the end of the year, affirming that: It (IMF) supports, for example, the government’s commitment to run Electra on commercial terms, which will enable this company to undertake much-needed investment to improve efficiency and capacity in domestic electricity and water production. In this regard, the mission team agrees that the automatic mechanism to adjust electricity and water tariffs according to changes in input prices needs to be rapidly implemented, and that the mechanism to adjust retail fuel prices needs to applied automatically and transparently.”

Graph xxx, Electra net profits, thousands of CVE. Source: Electra.

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### Table xxx, Historical prospect of Electra. (Source Electra)

<table>
<thead>
<tr>
<th>ELECTRA</th>
<th>Workers</th>
<th>Clients electricity</th>
<th>Electricity produced</th>
<th>Clients water</th>
<th>Water produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982 Fondation of Electra E.P.</td>
<td>196</td>
<td>9255</td>
<td>14'155'000kwh (consumed 9'538'000kwh)</td>
<td>2855</td>
<td>519'996 m³ (consumed 302290)</td>
</tr>
<tr>
<td>December 1992 Extension to Boavista</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>31-12-1998 ELECTRA SARL</td>
<td>362</td>
<td>29114</td>
<td>107'775'749 kWh</td>
<td>9919</td>
<td>1'785'998 m³</td>
</tr>
<tr>
<td>31-12-1999 with several municipality services integrated</td>
<td>594</td>
<td>38122</td>
<td>116'281'046 kWh</td>
<td>14'983</td>
<td>1'785'457 m³</td>
</tr>
<tr>
<td>31-12-2000 with the integration of S.Antão and Rabil na Boavista</td>
<td>686</td>
<td>47149</td>
<td>142'326'760 kWh</td>
<td>16'558</td>
<td>2'218'138 m³</td>
</tr>
<tr>
<td>31-12-2001 Integration of S.Felipe</td>
<td>725 of which 453 permanent</td>
<td>54485</td>
<td>164'331'892 kWh</td>
<td>18'311</td>
<td>3'005'679 m³ (75% desalination)</td>
</tr>
<tr>
<td>31-12-2002 integration of the whole country</td>
<td>724 of which 468 permanent</td>
<td>60724</td>
<td>181'004'000 kWh</td>
<td>19'585</td>
<td>3'639'255 m³</td>
</tr>
<tr>
<td>31-12-2003</td>
<td>681 of which 458 permanent</td>
<td>65538</td>
<td>198'652'284 kWh</td>
<td>22'578</td>
<td>4'049'930 m³ (85% desalinization)</td>
</tr>
<tr>
<td>31-12-2004</td>
<td>653 of which 534 permanent</td>
<td>71243</td>
<td>218'813'232 kWh</td>
<td>25'102</td>
<td>4'085'786 m³ (85% desalinization)</td>
</tr>
<tr>
<td>31-12 2005</td>
<td>659 (of wich 553 permanent)</td>
<td>77228</td>
<td>229'131'750 kWh</td>
<td>26'695</td>
<td>4'262'601 m³ (87% desalinisation)</td>
</tr>
</tbody>
</table>
8.2.3.3 Structure of the Electricity Sector

The Electricity Sector is vertically integrated. One company, Electra handles generation distribution and commercialisation of electricity services in all the islands (including water in some islands).

8.2.3.4 Ownership of the Electricity Industry

At the beginning of 2007, ELECTRA was a private company whose majority of shares are owned by the State of Cape Verde. A Portuguese consortium managed the company between 2000 and 2006 and now is the minority shareholder and technical partner.

8.2.3.5 Regulation of the Electricity Industry

The regulation of the sector is under the responsibility of ARE and of the Government. The Reform of the Electricity Sector started in 1999 with the decree n. 54/99 of the 30 August. The latest legislative act has been the decree 14/2006 of the 20 February 2006 that has the following objectives:

1) Assure an electricity service secure and reliable, an augmentation of the electrification rate, at a fair and non-discriminatory price.
2) to promote energy efficiency
3) Attract private investments, both national and foreign.
4) Stimulate concurrence and competition in the electric system-

The decree allows private sector to auto-generate electricity without any concession for private use if the installed capacity is equal or inferior to 7.5 kW. Another important point is the neutrality of the network that must allow distribution of the energy produced by Independent Power Producers - IPPs. The tariff system is, according to the law, subject to several conditions, between them:

- Maximum price system (for five years)
- Tariffs should allow the concessionary entity to recover costs and have a profit proportioned to the business risks.
• Tariffs have to promote efficiency and energy savings measures
• Tariffs readjustments do not have to perturbate economy and they have to be linked to the cost of goods and services in the country.
• Tariffs have to reflect the cost of providing energy to various categories of users.
• Cross subsidies (one category of users to another) are discouraged
• Tariffs may vary with regard of the period of the day or of the year.
• Consumers do not linked to the net might be asked to contribute to the connection costs. In order to improve accessibility the repayment might be done with monthly subscriptions.

8.2.4 Energy Poverty Policies

8.2.4.1 Energy and the PRSP

An interim PRSP was approved by the Government of Cape Verde in 2001. The final GRSP followed three years later and covers the period between 2004 and 2007 and follow the track already established by other policy programming instruments, like the National Development Plan. THE GPRSP objectives are the followings:

- **Pillar 1**: Promote good governance, reinforcing effectiveness and guaranteeing equity
- **Pillar 2**: Promote competitiveness to foster economic growth and employment creation
- **Pillar 3**: Develop and upgrade human capital
- **Pillar 4**: Develop the infrastructures, promote land use planning and protect the environment.
- **Pillar 5**: Improve the effectiveness and sustainability of the social security system.

The Energy Plan is within **Pillar 4**. As noted before, the Growth and Poverty Reduction Strategy paper deals in various parts with energy and a National Energy Plan (PEN) has been elaborated in this context. The GRSP clearly highlight the energy gap between poor and non-poor in Cape Verde, in the access to domestic policies and that in most islands, access to electricity is a privilege of the non-poor. The great majority (85%) of families use electricity as their main source of lighting while 27% use petroleum for lighting. Thus, the energy consumption pattern is different for the poor families: about 51% use petroleum as their main source of energy for lighting and only 32% use electricity as their source of lighting. On the other hand, 62% of the poor families use wood for cooking which constitutes a permanent pressure on the limited existing vegetation. In contrast, about 74% of non-poor families use butane gas for cooking purposes and as source of energy.
In general the GPRSP points the importance of energy for the development of Cape Verde and also quote the problems of access for the poor and in rural areas, but the general attention is more on the institutional and supply side than on inventing some mechanisms to help the poor to have access to modern forms of energy. The re-shaping of diesel fuel subsidies to only to serve for electric power stations in rural areas can, anyway, can be considered an indirect pro-poor measure.

Energy and electricity access are not high priority actions in the IPRSP. According to this report, close to half of all households have access to electricity (72% in urban compared to 21% in rural).

Although energy sector is not exclusively linked to the reduction of poverty, the PRSP documents of Cape Verde have tried to address low income areas and rural electrification in the PRSP. In the 2005 PRSP, specific indicators and actions/goals are made on the following two measurable micro indicators:

- Electricity coverage rate: 70% (2005), 75% (2006) and 78% (in 2007)
- Index of LPG utilization: Avg.Monthly Consumption (2.2kg in 2005, 2.3kg in 2006, and 2.5kg in 2007)

While the electricity coverage rate will measure rural electrification, the LPG utilisation rate will indicate progressive substitution of wood fuels for LPG.

### 8.2.4.2 Other Energy Poverty Initiatives

To support the Power Sector Reform, World Bank and GEF have issued two projects (P040990, P042054) with a loan of 17.5 USD millions from WB and a grant from GEF of 4.7 USD millions. The projects are scheduled for the period 1999-2006 [World Bank Project Database. Refer website].

Even if there has been some experiment on this matter, there is no large scale project to fill the energy gap between the poor and the non-poor. The main problem for electricity access is the cost of a new connection. For the extreme poor energy still means open-fires to cook meal in outside kitchens, and collecting *free* fuelwood and do not seems that there is any specific policy to target this group of people.

### 4. Policy recommendations

Some important lessons can be learned from the experience of Cape Verde. **Firstly**, the privatisation of the electricity utility before setting up a clear system of rules lead to
problems, opportunistic behaviours and to the probable failure of the process. During the period 2000-2006 the two shareholders and the regulatory authority have not succeed in finding an agreement on a very essential thing like a clear and transparent tariff system for Electra. The tariff dispute mined the relationship between the Portuguese and Cape Verde partners, paralyzed the company and thus procured great damages to the consumers and to the economy. It has to be considered also that the privatization of Electra has not been a simple "market business" because the partners involved are a government and a government controlled utility (in fact, the dispute was resolved with a direct meeting between the prime ministers of Portugal and Cape Verde). Political aspects have been very important in this business.

With the majority of the stock back into the control of the State, the disagreements between the management and the government of Cape Verde is expected to be avoided. However, the structural problems also need to be fixed by the management of the company.

**Secondly**, the investment approach of Electra has been very traditional. Albeit faced with the huge problem of containing generating costs, Electra surprisingly did not consistently invest in wind energy development: wind electricity in 2006 was still a very little part of the energy mix. The Government did not pressurise for the exploitation of wind resources, not making any pressure or not following its own energy policy objectives contained in the National Energy Plan 2003-2013.

**Thirdly**, there is an absence of specific pro-poor measures targeted at that third of the population that does not have electricity and even kitchen. This lack may have serious social and environmental consequences and should be addressed with specific projects and policies targeted to the poorest part of the population. Although the 2005 PRSP mentions specific targets for electricity coverage rate and index of LPG Utilization, this is not seen to reflect an urban or a rural division of targets. Unless this division is created, it will still be difficult to measure energy sectors influence on poverty reduction.
8.3 CHAD

8.3.1 General principles / macro policies
The most important energy initiative developed in the country has been the development of the oil fields and the construction of the Chad-Cameroon pipeline. Several policy and regulatory changes have been made to implement this initiative in accordance with the international institutions, including the creation of a Fund for Future generations to channel part of the oil revenues. The Household Energy policy also is very important, if not more, considering the high dependence of Chadian population on traditional biomass for domestic energies,

8.3.2 Public Institutions
The power industry, governmental and related organisations in Chad are;

- Ministry of Mines, Energy and Petroleum
- Ministry of Petroleum
- Directorate of Oil, and New and Renewable Energies
- Directorate of Geological and Mining Research
8.3.3 Electricity

8.3.3.1 Structure of the Electricity Industry

The electricity industry is vertically integrated and the state run Société Tchadienne D’eau et D’électricité (STEE) has its own generating plants, transmission system, and distribution lines to provide all aspects of electric service.

8.3.3.2 Ownership of the Electricity Industry

At present, the electricity industry is publicly owned and the state run Société Tchadienne D’eau et D’électricité (STEE) is the organisation responsible for electricity generation, distribution and supply. There has been an attempt at privatization in the past years. In 2000 Veolia (ex Vivendi environment) started to manage the STEE under a management contract and was planned to acquire the society in the upcoming privatization process. In 2004 anyway Veolia resigned from the contract and the privatization process has been frozen.

8.3.3.3 Regulation of the Electricity Industry

The government is predominantly responsible for the regulation of the electricity industry including price regulation, through the Ministere des Mines, de l’Energie e du Petrole (WEC 2005b).

8.3.4 Household Energy

Strategy for Domestic Energy:

Fuelwood meets 90% of the total national energy consumption in Chad and the forest resources which provide the much needed woodfuel are irrationally and carelessly exploited. In response to the need to halt the fast degeneration of the environment and the increasing need to supply the Chadian population with affordable sources of energy, the Government drafted a Strategy for Domestic Energy in the early 90’s. This strategy has given rise to the launch of the Household Energy Project.
Household Energy Project:

The aims and objectives of the project are to;

• Restore and conserve the natural environment through a rational management of natural resources.

• Satisfy the demand for household energy in a lasting and reliable manner.

• Fight rural poverty through the provision of local employment opportunities; and an optimal distribution of revenues accrued from the wood resources (Ali A.M., no date)

8.3.5 Fossil Fuels

Petroleum revenue management law:

A significant deciding factor in the World Bank Group’s support for the Chad Cameroon oil pipeline project was the 1999 Petroleum Revenue Management Law. This law was perceived as a very distinctive opportunity for the republic of Chad to make use of its oil revenues to address and enhance poverty reduction for the following reasons;

• The bulk of direct revenue to the Government from the pipeline project by law was required to facilitate ‘priority sectors’ - health, education and rural development. These priority sectors services are coupled with improving living standards and poverty reduction.

• A Future Generations Fund was also set up by the law to ensure that even when the oil reserves where exhausted, there would still be some benefits to the population.

• Nevertheless a change to this law was made by the government in January 2006 as depicted by the following;

• Priority sectors were broadened to include among other areas territorial administration and security; changes were made to the definition of priority sectors

• The Future Generations Fund was abolished allowing the transfer of more than US$36 million to the general budget

• It increased the percentage of the share of royalties and dividends to be allocated to non-priority sectors from 13.5% to 30% and this will not be subject to oversight or control

As expected, this did not augur well with the World Bank as it considered these changes weakened the poverty focus of the program substantially thus undercutting the basis for
the Bank’s initial support (World Bank). World Bank subsequently suspended all loans and grants for Chad in January 2006.

After some months of negotiations, the Bank and the ? signed a new Memorandum of Understanding in July 2006. The new document is a commitment to spend 70 percent of its 2007 budget to priority poverty reduction programs and to develop a new PRSP in the course of 2007, in order to allocate resources to poverty reduction in the following years.

Code for Oil Production:

The Chad Code for Oil Production has been revised to allow for production sharing agreements (PSA) between foreign companies and the Chadian government. This is so that all exploration costs will no longer be borne by only the foreign investors (MBENDIa).

8.3.6 Energy Poverty Policies

8.3.6.1 Overall PRSP objectives

The Poverty Reduction Strategy Paper of Chad was published on June 30, 2003 and was written by the PRSP Steering Committee, Ministry of Planning Development and cooperation. It was then followed closely by a Joint Staff Assessment (JSA) in October 6 of the same year and this was prepared by the staff of the International Development Association (IDA) and the International Monetary Fund (IMF) (MDC 2003).

The PRSP objective is to reduce poverty by achieving the following targets during 2003 to 2015;

| Promote good governance                      | • Ensure strong and sustained economic growth  |
|                                            | • Improve human capital                       |
|                                            | • Improve the living conditions of vulnerable groups |
|                                            | • Restore and safeguard ecosystems            |
| Ensure a strong and sustained economic growth | • Promote the private sector                  |
|                                            | • Develop basic infrastructure and support for growth |
|                                            | • Achieve a sustainable increase in rural output |
| Improve human capital                      | • Promote education, training and literacy campaigns |
|                                            | • Address health issues especially HIV / AIDS  |
| Improve the living conditions of vulnerable groups | • Increase work on integrated urban development |
|                                            | • Provide support for micro enterprises, SME and employment |
|                                            | • Have adequate social protection             |
| Restore and safeguard ecosystems            | • Strengthen the regulatory framework and natural resource management capabilities |
|                                            | • Improve household energy management         |
The PRSP acknowledges that energy resources are a major production factor hence vital for the country’s development. Presently Chad uses traditional sources of energy; firewood and kerosene as well as electricity to provide heat and power. There is also potential for alternative sources of energy from solar and wind. However as only less than 2% of the total population (9% of the households in N’Djamena the capital) has access to electricity, it is obviously not available to majority hence resulting in very low productivity.

The extremely few enterprises that exist in Chad are heavily penalised by the very poor electricity supplies. This unavailability of electricity is due to exorbitant costs, poor management of electricity production and distribution as well as the lack of a proactive policy in the energy sector especially with regards to rural electrification. Proper management and sustainable use of energy sources will help halt deforestation as well as increase access to energy for productive purposes.

The 2003 PRSP also mentions the need to promote alternative energy sources such as solar and wind to lessen impact of cutting down fuelwood and also expand energy usage for productive activities such as agriculture and industry. There is an expectation that the revenues from the oil sector will help develop infrastructures conducive to productivity, and will stimulate private investment, growth, and employment ultimately benefiting the poor. To do this, the monitoring plan is set to ‘apply the Oil Revenue Management Law LGRP, from 2004-2015, and to increase budgets for priority sectors such as health, education, rural development, infrastructure, and environment. For the energy sector, two actions are proposed as follows:

- Perform a stock taking of the regional solar energy program with a view to optimising its contribution to a national program on new and renewable energy
- Implement the emergency program of the water and electricity company (STEE)

The management of household energy resources are also planned but under the Ministry of Agriculture proposing the following actions:

- Promote viable firewood production in rural areas
- Make forest exploitation an income source for rural populations
- Ensure rural populations are more involved in natural resource management
- Ensure tax system applicable to wood and wood preservative products has a regulatory role and
- Promote furnaces and high performance instruments for producing household energy
All these actions for the energy sector were also short term (2003-2005). There were no clear linkages or strategies of energy to poverty reduction in the PRSP planning.
8.4 GUINEA BISSAU

8.4.1 General principles/ macro policies

In 2000, the Government elaborated on some key energy policy principles as below:

- Create the conditions for the production and procurement of different sources of energy
- Create the conditions for an adequate energy policy
- Create the conditions for a rehabilitation of infrastructures
- Create the conditions for private participation
- To modify the role of the State to permit investment mobilisation and environment protection
- To promote energy substitution
- To promote electricity production through hydro
- To participate to regional initiatives, like the ones of ECOWAS and OMVG

The political instability that characterized the country has however sensibly slowed the transformation of these principles in practical actions. In fact, the priority has been the rehabilitation of the infrastructures after the disruption of the war.
8.4.2 Public Institutions

Energy policy is governed by the Ministry of Energy, Industry and Natural Resources (MERN). The Ministry is responsible for both the electricity and petroleum sectors. Energy policy is defined by the State Secretariat for Energy (SEE) and put in place by the General Direction for Energy (DGE) that has three subsectors, 1) rural electrification, 2) domestic energy, 3) studies and projects.

The National Institute for Research and Applied Technology (INITA), under the MERN, promote research and application of technologies, especially renewable energy sources.

8.4.3 Electricity

Electricity is provided by the state-owned utility Electricidade et Aguas de Guinea Bissau (EAGB) which controls the production, transmission and distribution of power in the capital and it is now responsible for this, and setting the price, throughout the country. 6% of Guinea Bissau’s population have access to electricity, however this figure hides regional disparities with 50% of the capital having access to electricity compared to only 1% in rural areas (IEPF, 2001).

8.4.3.1 Structure of the Electricity Industry

Actually EAGB is a vertically integrated society.

8.4.3.2 Ownership of the Electricity Industry

EAGB is owned by the national government and is responsible for 90% of production, with the remaining 10% originating from small, independent producers. The intention of the government is to privatize it but no effective steps have been taken in this direction.

8.4.3.3 Regulation of the Electricity Industry

The government promised a new electricity act by the end of 2006.

The government’s Ministry of Energy and the state owned electricity company are the two main stakeholders that take responsibility for regulation of the electricity industry. The government intends to create a rural electrification agency and a regulatory commission, as well as a plan for electrification.

8.4.4 Household Energy

The government’s plan is to rationalise the use of wood-fuel through devolvement of responsibility to local communities and also through the diversification of fuels. The
PREDAS project has elaborated a detailed strategy for domestic energy for Guinea Bissau, with the global objectives of assure the procurement of energy, protect environment, ameliorate life conditions in rural areas and reinforce the policy coherence. The strategy is based essentially on changes in the predominant wood-fuel market, in order to promote its change from an informal sector, that use resources in unsustainable way, to a formal sector, in which the wood resources are rationally managed in a sustainable way. To do this, the creation of regional decentralised institution is deemed essential, together with a strategy of self management and responsibility by the local communities. Intervention is needed anyway not only from the institutional and production side, but also from the consumers’ side. The diffusion of improved cook-stoves, and all the related ecosystem of production and maintenance, is equally important to assure a more sustainable use of resources and better safety conditions for women and children.

8.4.5 Fossil Fuels

The oil industry is regulated by the Ministry of Natural Resources and Industry. The national oil company of Guinea Bissau is PetroGuin (previously Petrominas) is responsible for importing, stocking and distributing all petroleum products and is jointly owned by Guinea Bissau and the Portuguese. A subsidiary of PetroGuin, Distribuidora de Combustíveis e Lubrificantes (DICOL) has a monopoly on importing and distributing butane gas. The government currently fixes the retail price for petroleum products by decree. The products covered are fuel, diesel, special mixtures, and diesel reserved for the electricity company. Under this system, the retailers margin changes with the cost of oil. For instance, although gasoline prices started to increase rapidly in April 2004, the authorities did not raise the domestic retail price until March 2005, causing severe problems for retailers and leading to shortages and an increase in smuggling. The price was then adjusted four times in less than two years. These adjustments were irregular and infrequent, occurring whenever there was pressure on gasoline supplies (IMF, 2006). It is expected that an automatic adjustment mechanism will be implemented at the end of 2006 which will change the price, depending on the Senegalese oil price, and the c.i.f. price in Guinea Bissau.

Guinea Bissau has considerable offshore oil reserves which have the potential to produce 7 million tones per year (IEPF, 2001). Exploration stopped in 1989 because the development and production costs were thought too high. Following a border agreement with Senegal in 1995, exploration has restarted.
8.4.6. Energy - Poverty Policies

8.4.6.1 Overall PRSP objectives

Guinea Bissau presented their Interim National Poverty Reduction Strategy Paper (I-NPRSP) in September 2000. The strategy was hindered mostly by the lack of availability of data on poverty indicators. The government followed a broad based participatory process to develop the strategy paper including input from various stakeholders both public and private. Guinea Bissau’s PRSP focuses on four priorities:

• To reinforce good governance and modernize the public administration and ensure macroeconomic stability;
• To promote economic growth and job creation;
• To increase access to social services and basic infrastructure; and
• To improve the livelihood of the most vulnerable segments of the population

The status of the PRSP is unclear at present. The I-PRSP for the period 2000-2003 went off track in late 2000 due to fiscal policy slippages associated with heavy defence spending (DFID, 2005).

The 2000 Interim PRSP seeks to reform the energy sector by transferring the public electricity sector (EAGB) to a private sector operator and establish an independent energy regulatory agency. The government also intended to focus its actions on strategically significant and regulatory issues and to encourage participation by the private sector in the area of water and sanitation. To this end, the Water and Sanitation Sector Master Plan was expected to be approved by November 2000, involving amongst others broadening the solar energy program for water pumping. (Government of Guinea-Bissau, 2000).

Some indicators were also included in the monitoring plan mainly to implement institutional reform of the energy and water sector that included:

• Submit the law on electricity to the People’s National Assembly.
• Open financial proposals submitted in public bidding for EAGB lease contract.
• Establish an independent regulatory agency

These were short term targets and little information was provided on how these programmes were to be implemented, and as noted elsewhere in this chapter efforts have been hampered by political instability and economic insecurity. It is also unclear as to whether the new PRSP will differ significantly from the existing interim document.
8.4.6.2 Other Energy Poverty Initiatives

Guinea Bissau’s recent emergences from internal conflict, fighting along parts of the Senegalese border and political instability have meant a dearth of international donor activities. However, greater stability is likely to result in an increase in donor activities in the near future. A donor roundtable is due to be held at the end of 2006, under the auspices of the UNDP (a full-scale donor roundtable cannot be held until the budget has been approved by the National Assembly and the country has started to show signs of political stability) putting pressure on the government to get the budget approved by the National Assembly. An IMF mission visited the capital, Bissau, in August 2006 as part of its Staff Monitoring Programme (SMP) and in preparation for the donors round table. The mission concluded that there had been progress in the economic situation over the past three years and indicated (subject to certain conditions) the IMF’s willingness to approve a post-conflict financial package for Guinea Bissau in January 2007.
8.5 MALI

8.5.1 General principles. / macro policies

Energy Policies in Mali are part of a comprehensive national approach and are strictly interconnected with the policies of other areas regarding the valorisation of the rural sector, the economic reforms, the decentralisation process, the poverty reduction strategy, the environmental policies, the participatory approach, and the coherence of all policies. Between them we can recall:

- The letter from the President of the Republic of Mali to the Prime Minister on the 23rd of October 2002 highlighted the importance of the rural sector and the necessity of improving infrastructure and energy access.
- The economic reforms are based on the disengagement of the State from the productive sector, and on the privatization of public enterprises, and promotion of the private sector growth through a better business environment, regulatory reforms and modernisation of the state administration.
- Decentralisation policies in place since 1992 are based on financing autonomy and democratic governance. Local authorities play a special role in the managing of local natural resources.
- The poverty Reduction Strategy has several interconnections with energy policies.
- The Environmental Policies are based on responsibility, participation, prevention and
precautionary principles and on the internalization of environmental externalities.

- The general energy policies principles are:
  - valorisation of national resources (hydro and other renewable energy sources);
  - safeguard and ensure sustainable use of forestry resources
  - improving fossil fuels buying conditions
  - fossil fuel exploration
  - liberalisation of the energy sector
  - capacity building for the State
  - import of renewable energies equipment duty and tax free for 5 years (2/2002 decree)

Here it follows an overview of the principal policies and regulations in the energy sector, by type of energy, and by type of institution.

8.5.2 Public Institutions

The National Water and Energy Directorate (DNHE) is Mali’s primary governmental institution for implementing national energy policy, regulating the energy sector and the planning of large energy and water projects. The DNHE also oversees various projects such as the National Program for the Promotion of Butane Gas, the Special Energy Program (PSE) and the Domestic Energy Project, and supervises the operations of a number of entities. In 1999, the National Energy Directorate was designed to be an energy board within the DNHE to strengthen coherence of the national energy policy.

The national electricity company Electricité du Mali (EDM) is responsible for electricity production and its distribution, support for development of new energy projects. Other public institutions are:

- The National Center for Solar and Renewable Energies (CNESOLER): R&D and promotion of RE
- National Directorate for Rivers and Forests (DNEF): Controls exploitation of forest resources, including wood fuel and charcoal.
- National Directorate of Agriculture (DNA): Biogas research and production

8.5.3 Electricity

The Electricity Sector in Mali is dominated by EDM that generates, transmits and distributes the great majority of the electricity in the country. The Electricity Sector in Mali has
undergone several reforms during the last ten years. The bulk of the reforms have been the creation of an independent regulatory agency and the privatisation of EDM.

8.5.3.1 Structure of the Electricity Industry

EDM SA is a vertically integrated energy enterprise and manages generation, transmission and distribution for 97 localities. There exist also two others Decentralised Services Societies that deliver off-grid electricity services for remote areas, - SSD Koutiala (owned by NOUN and EDF) and SSD Kayes (owned by EDF and Total), that are present in 25 localities.

Two localities (Kadiolo and Zégoula) are connected to the grid of Côte d'Ivoire since 1966.

8.5.3.2 Ownership of the Electricity Industry

From 1960 Electricité du Mali EDM shares have been 97% property of the State and for 3% of Electricité de France EDF. In 1995 EDM delegated its management to an external consortium, composed of SAUR International, Hydro-Quebec, EDF, and CRC SOGEMA. In 1998 due to unsatisfactory performances the contract management ended. In 2000 the government made shares available to the public (and the society was recapitalised from 4.7 USD millions to 60.2 USD millions).

In 2002 the company shares distribution were the following 40% for the government and 60% for the group SAUR/IPS - West Africa. The concession contract for EDM SA covers 97 localities for 20 years. EDM committed to invest 140 USD millions in the first three years. Hydroelectric facilities remain in the ownership of the state. In October 2005 Saur International decided to withdraw from EDM for unresolved differences with the government (especially about tariffs). After this decision the stock of EDM is now owned for the 66% by the state and for the remaining 34% by IPS.

Self-production is allowed and submitted to declaration and authorisation.

8.5.3.3 Regulation of the Electricity Industry

The Regulation of the energy sector is under the responsibility of the Commission de Régulation de l'Eau et de l'Electricité CREE, created in 2000. CREE duties are approving and controlling tariffs and ensuring compliance with contracts, monitoring calls for tenders and concessions, arbitrate conflicts between service providers and defend consumer interests.
CREE established tax-exemptions for imported renewable energy equipment and investment subsidies for rural electrification.

### 8.5.4 Domestic Energy

Mali has recently implemented a Domestic Energy Strategy (SED - Stratégie d’énergie domestique) based on the principles of controlling domestic energy demand, sustainable management of fuelwood resources, improving direction and information on domestic energy. Domestic energy policies are particularly important and refer to production, commercialisation and use of different energies, to fuel substitution and to energy efficiency. Before the SED other programmes have been put in place with direct effect on domestic energies, between them we can remember the National Programme on the promotion of Gas Butane (carried out by CILSS), the project on the diffusion of improved cook stoves, and the programmes of fight against desertification.

The most important programme on Domestic Energies is the PREDAS programme (regional program for the promotion of domestic and alternative energy sources in Sahel / programme regionale de promotion des énergies domestiques et alternatives au Sahel). The objectives of PREDAS are 1) help the states to conceive their domestic energy strategies, 2) build a network of professionals in domestic energies and 3) help the States to better manage their fuelwood resources.

### 8.5.5 Forestry and Biomass

As traditional energy covers more than 80% of the country population’s energy needs, the policy and regulations in this sector are particularly important. After the dictatorship rule ended in 1991 local communities expressed their interests for participation in the management of local forestry resources. Revision of the forestry legislation started in 1992 with nation wide consultations to prepare a National Conference that was held in July 1993 and this produced a set of recommendations for a more coherent legislation regarding forestry and domestic energies, in order to provide urban centres with fuel wood in a rational and sustainable way.

The new legislation consists of the following acts:

- Law 95-004 (18 January 1995) on the management of forestry resources
- Law 95-003 (18 January 1995) on the organisation of exploitation, transport and commercialisation of fuelwood
- Decree 422/P-RP (5 December 1995) on tax revenue for forestry exploitation,
In 1996 a national Strategy for Domestic Energy was developed, with the double objective of ensuring that the ways of exploiting fuel wood are sustainable and encouraging energy substitution. The following are the principal points of this strategy:

- Respect and guarantee of the property rights (private, collective or state)
- Reconnaissance of local and regional conventions
- Promotion of socio-professional organizations
- Improved management more useful than repression
- Decentralisation of control and management, tax collection and transport and commercialisation permits
- Fuelwood tax for the fuelwood destined to the cities
- Taxes differentiated upon origin and methods of exploitation of fuelwood.

The new forestry and domestic energies policies are based on local control, management and exploitation, on increasing professionalism and ownership of local communities and fuelwood professionals. The law defines the rural fuelwood markets, managed locally in the framework of the *Schemas Directeurs d’Approvisionnement des villes en bois energie*, that are plans for the provision of fuelwood to the principal cities. Each local fuelwood market is a self managed commercial structure, with a specific exploitation area and authorised operators. The law also defines tax repartition between the state and the local communities, and the division of maintenance works on forestry areas.

The new legislation helped to create around 250 rural fuelwood markets, the elaboration of the supply schemes for the principal cities, the professionalism of the sector, the ownership and responsibilities of local communities and the increase of the price of fuelwood. The impact on environment has been considered largely positive, with 15000 CO2t per year of savings, while the impact on the economy is not yet clear.

### 8.5.6 Fossil Fuels

Policies in the Fossil Fuel Sectors have undergone the same reforms and restructuring than other sector of the economy, essentially with the departure of the state from the productive sectors.
8.5.7. Energy Poverty Policies

8.5.7.1 Energy and the PRSP

The original Poverty Reduction Strategy Paper, published in 2002, addresses energy in various aspects. First energy infrastructure is considered a pillar of the PRSP with the specific objectives of (i) improving the population's access to all forms of energy, in particular modern energies and (ii) ensuring rationalization in the use of existing energy sources. The policy envisaged for the energy sector are (i) production and distribution of low cost electricity; (ii) increasing the share of the population served by electricity; (iii) reducing wood consumption through use of improved equipment and alternative fuel sources; and (iv) implementing a program to promote solar-powered and photovoltaic equipment for a large share of the population.

Between the various policies stated in the PRSP it's important to recall the development of sub-regional cooperation on energy (that's what is happening with the ECOWAS Energy Initiative), fuel substitution policies and protection and sustainable use of fuelwood resources, decentralisation, and continuing the privatisation of EDM (whose shares, at the time, were private for 60%).

8.5.7.2 Other Energy poverty Initiatives

Some important energy-poverty projects have been implemented in Mali, with the support of international cooperation. Between them it's important to recall.

AMEDER

Agence Malienne pour le Developpement de l'Energie Domestique et de l'electrification Rurale has been created to manage the Household Energy & Universal Rural Access (HEURA) programme. The HEURA program has a budget of USD 53 million for five years and is financed by the Government of Mali, Global Environmental Fund (GEF), International Development Association IDA and UNDP. The objectives of HEURA are the acceleration of the adoption of modern energies, the promotion of sustainable use of fuelwood and to create favourable conditions for private investments in the energy sector.

Multifunctional Platforms

Multifunctional Platforms (MFP) implemented by UNDP and UNIDO are installations of diesel engines (8-12HP) connected with a plurality of tools for water pumping, electricity generation, processing of agricultural products etc. The MFP are managed by cooperative of women and financed jointly by the villages’ cooperatives and the donors. The MFP program started in Mali with the support of UNDP with initial few installations. The program quickly
gained the support of the government and encountered the favour of the rural populations with more than 500 MFP currently installed and operating in rural villages around the country with more plans for scaling up the program. The impacts have been positive with provision of potable water via the MFP powered pumps, mini electricity networks, and the empowerment of women to be owners and managers.

The experience of MFPs has been the object of numerous studies and literature, and its success has led to the implementation of MFPs to neighbouring countries of Burkina Faso, Guinea, Senegal and Ghana. However, the benefits all come at a cost and support by UNDP and the organisations trained has resulted in a per platform costs exceeding US$25000. This has hampered rapid dissemination even after a decade of work.

**Domestic Energy and Access to Basic Services in Rural Locations Project (PEDASB)**

The Domestic Energy and Access to Basic Services in Rural Locations Project (PEDASB) as launched with the objectives: accelerate the use of modern energy types in rural areas and areas on the periphery of cities; promote forest management on a community basis; strengthen the reform processes of the energy sector and allied institutions. The Malian agency for development of rural electrification (AMADER is responsible for implementing the PEDASB) and also promote domestic energy.

**RESCO Rural Electrification Programs:** Initiatives by the Electricité de France (EDF) setting up Renewable Energy Service Companies (RESCOs) has been deemed successful in the western parts of the country. The Yeelen Kura RESCO created by EDF and NUON, a Dutch electricity Company was partially funded by the Dutch government (about 30% net grant of total cost) owns 1500 solar kits utilised to generate and provide energy services to households, schools, and medical centers. Solar pumps are also set up to be maintained by the RESCO. Another RESCO, the Koraye Kurumba sells energy services to the rural population in the northern region of Jayes, based on use of low voltage village micro networks powered by a combination of small diesel generators and PV kits of 50 to 100Wp for 10% of households. The management prefers the fixed fee paid model according to the services hosen with payment adapted to customer needs.

**Promotion of Jatropha:** In Mali, the promotion of Jatropha has been significantly high. The GTZ and UNDP have in the past implemented projects from 1987 onwards such as the Programme Spéciale Energie (Special Energy Program) experimenting with use of Jatropha oil as fuel and the le Projet Pourghère (Jatropha Project) implemented by the Centre
National d’Energie Solaire & des Energies Renouvelables (CNESOLER Malian National Centre for Solar & Renewable Energy) to demonstrate the use of vegetable oil fuelled engine to power mechanical agro processing equipments. The Mali Folk Center (MFC) has also been actively promoting the use of Jatropha as a diesel substitute since 1999 aiming to increase local production and an impact on local employment, and income generation.
8.6 ISLAMIC REPUBLIC OF MAURITANIA

8.6.1 General principles/ macro policies

Mauritania has been very active in the energy sector in the last years. Between others we can recall the following policies:

- Liberalization of imports of petroleum products (1994)
- Development of a Development Policy Letter for the energy sector (1998) declaring its commitments to facilitate substantial support of private capital for the development of the electricity sector.

The Government of Mauritania also adopted a landmark electricity law in 2001 referred to as ‘code de l’électricité’ which opened up markets to competition. The government also restructured the electricity sector by separating water and sanitation activities from the power business as of July 2001, marginally extended on grid electricity access through the transmission from the Manantali hydropower dam. A rural electrification master plan has been carried out in an effort to achieve coherence along with the intended on grid electricity expansion program.

In Mauritania, the privatisation of electricity assets were underestimated attributed later mainly to attracting private investors in combination with external factors notably the sharp reduction in foreign direct investments following the 11 September 2001 event, the Enron scandal etc. Meanwhile internal problems such as the relatively small size of the electricity
sector, dependence on operating subsidies, and expansion by the government to unprofitable poor urban areas and isolated districts, non compliance with tariff revisions were some causes that slipped back policy changes. Reforms were also held back once Mauritania reached HIPC completion point and granted debt relief providing no incentive to the government. Regulatory frameworks were thus, not fully formed and private sector participation was weak.

For the HIPC, the Bank’s counterpart was the Ministry of Economic Affairs and Development (MEAD) rather than the Ministry of Hydraulic and Energy (MHE). The institutional responsibility of the MEAD was mainly economic matters, concurring with reform goals but not necessarily the correct institution to reform the energy sector. In January 2001, ARM was created to provide the regulatory framework for the power sector and the electricity code was passed. SOMELEC is technically not in compliance with the electricity law provisions with the consequence that the ARM had no real power to regulate SOMELEC. A coup in 2005 disabled the country politically and electricity reform has been slow.

8.6.2 Public Institutions

The two institutions that regulate the energy sectors are:

- The Minister of Energy, Hidraulic and Information and Telecommunications technologies
- The Multisectorial Regulatory Commitee created in 2001

8.6.3 Electricity

The proportion of households connected to the electricity grid increased from 18% in 2000 to 24% in 2004, resulting largely of the rising urbanisation (IMF, 2007). There were significant investments made aimed to increase supply of electricity since 2001. The situation in the major urban centers were improved by the commissioning of the Manantali power station and connection to the cities of Nouakchott, Rosso, Kaédi, and Boghé to its network as well as the expansion of the thermal power station at Nouakchott (installation of two power units of 7 MW each). Grid electrification was also carried out in 17 towns including 15 district capitals out of the 24 not yet on the electricity network. The Rural Electrification Development Agency (ADER) and the Agency for Universal Access to Services (APAUS) are both active, and by 2006 had provided 4,100 households with individual solar kits (IMF 2007).
8.6.3.1 Structure and Ownership of the Electricity Industry

As part of economic reforms and agreements with the IMF and World Bank, the Mauritanian government committed itself to privatization of the national electricity utility, SOMELEC (Société Mauritanienne d’Electricité) in 2001. However, the privatization of SOMELEC could not be completed on time (April 2002) for a number of reasons that were reported to the IMF in 2002. These included delays caused by third parties, loss of confidence following the Enron crisis and withdrawal of bidders (IMF, 2002). In addition, electricity tariffs remained the same from 2000-2004 resulting in severe liquidity problems in the face of an annual average inflation of 4.6 percent in Mauritania over a three-year period. As a consequence, net cash flow from current operations, taking the variation in working capital into account, was negative of US$400,000 equivalent in 2003 leading to a need for more government subsidies.

The L’Agence de développement de l’électrification rurale (ADER) is responsible for rural electrification whilst SOMELEC handles power generation and distribution.

8.6.3.2 Regulation of the Electricity Industry

In 1998, the Government of Mauritania launched a comprehensive reform of its electricity sector with the adoption of an electricity reform program. The program included opening the electricity market to competition, establishment of a regulatory environment conducive to private participation. A new Electricity act was enacted in 2001 which stopped SONELEC, the national power utility’s monopoly of power operation, and established the Multisectorial Regulatory Commission.

The regulation helped establish SOMELEC but the tendering process was unsuccessful prompting the government to revisit its privatization strategy. Further issues such as including regulation to attract private finance, increase public-private partnerships, protect property rights and public interests were seen to be important points that needed to be included in new regulatory frameworks. The authorities also sought to adopt the principle of a state operator framework agreement prioritising improved access to electricity, promotion of public-private partnerships, and capacity building. In March 2005, the Mauritanian government created a separate ministry of oil and energy to handle the energy portfolio.
8.6.4. Energy Poverty Policies

Mauritania’s first Poverty Reduction Strategy Paper (PRSP) covered the period 2001-2004 and the stakeholders involved in preparing the PRSP identified the following priority areas: rural development, urban development of neighborhoods located on the fringes of large cities and the main secondary towns, education, health, and water supply.

The PRSP lays out four pillars aimed at:

i. stimulating accelerated and redistributive growth;

ii. anchoring growth in the economic environment of the poor particularly in rural sector;

iii. developing human resources and ensuring universal access to basic infrastructure and services; and

iv. strengthening institutional capacities and governance.

The PRSP is implemented through Regional Poverty Reduction Programs (PRLP) for each of the 13 wilayas (regions). With respect to its second pillar, the PRSP recognizes that developing and diversifying the rural sector is essential to developing trade, reducing production costs and enhancing the competitiveness of the economy. In the long term, the strategy defines the need to reduce the proportion of Mauritanians living below the poverty threshold to under 27 percent by the year 2010 and below 17 percent by 2015, and also reduce the social and spatial inequalities.

The second PRSP has been presented in 2006 and builds on the experience of the previous one, providing several corrective actions to better focus on the different determinants of poverty.

Mauritania has a National Energy and Poverty Reduction Strategy. The original PRSP emphasised the importance of liberalization and privatization of the sectors of telecommunications, energy, and air transport sectors. Specifically, the first PRSP points to the following developments to increase access to electricity in Mauritania:

1) Privatisation of the electricity branch of SOMELEC in 2001 – to allow private investment in electricity service delivery. However, the privatization never took place. Instead, the Manantali power station was built and improved the supply of energy, particularly in the Valley area, and permit interconnection with the Nouakchott network, thereby contributing to securing long-term supply and reducing costs.

2) Establishment of the Rural Electrification Development Agency (ADER)

The ADER together with the Agency for Universal Access to Services (APAUS) have already provided almost 4,100 households with individual solar kits.
In the PRSPs, the replacement of charcoal is addressed under the environmental policy section for maximizing the potential of the natural biodiversity heritage through the implementation of a massive program to utilize butane gas and other alternative energy sources.
8.7 NIGER

8.7.1 General principles / Macro Policies

The PRSP of Niger states three clear policy objectives for energy policies:

1) To reduce the consumption of fuelwood.

2) To increase the access to electricity: Expanding the power grid coverage from 4 percent to 15 percent and increasing the access rate from 5 percent to 25 percent by 2005.

3) To maintain the actual level of mining activities and diversify the production.

The PRSP in 2002 states the principle to continue the privatization process but do not explicitly mention the privatization of energy enterprise. The last available information from the IMF (IMF PIN, January 5, 2007) states that the directors (of IMF and World Bank) urged to complete the restructuring of the electricity company, and that the discussions with the World Bank on the new strategy to render more attractive the offer for sale of the electricity company, the NIGELEC, are underway.

The 2005 PRSP status report is more specific with the objectives of:

- Maintain the competitiveness of mining companies.
- Mobilize the country’s private sector with a view to its involvement in mining research and operations.
- Make the mining sector contribute to local development.
- Develop artisanal and small-scale mining operations.
- Conduct a feasibility study for the mining of coal deposits in Salkadanna and, if feasible, begin operations for the production of electricity and charcoal briquettes.
- Provide 100 percent of villages of over 1,000 inhabitants with electric power by 2015.
- Increase the population’s electricity coverage rate to 66 percent by 2015.
- Provide the entire population with access to modern cooking fuel by 2015.

It is interesting to note the ambitious targets regarding electricity and modern fuels to be reached by 2015.

### 8.7.2 Public Institutions

The principal bodies in charge of energy policy formulation in Niger are

1) **The Ministry of Mines and Electricity**- the principal body governing the energy sector. Even with the new electricity law (2003) that established an independent regulation authority, the Minister is the central part of the power in the sector. The Ministry has the following responsibilities: defining sector policy, laws and by-laws, plans for electrification, tariffs, technical control of the electricity public service, approve technical standards, give authorisation to electricity production, transmission and distribution and many others.

2) **The Ministry of Environment**

3) **The Multisectorial Regulation Authority** (Autorité de Régulation Multisectorielle - ARM) a newly created independent authority that oversee on energy, transport, telecommunications and water. It has been established with the electricity law (31 Jan 2003). The legislation gives to the ARM a role of mediation between the Ministry, the consumers, and enterprises. The principal functions of ARM are: defend consumer interests (price and quality of energy), participate to the development of the system, allow third parties to access the network, safeguard the concurrence, and give advice to the Ministry on various matters. The ARM does not deal with rural electrification.

4) **The Multisectorial Committee on Energy** -(Comité national Multisectoriel Énergie - CNME) A consultative body established in 2003 by the Ministry of Mines and Energy, following the workshop held in Duala (Cameroon) "Energie Modernes et Reduction de la pauvreté" by ESMAP / World Bank. The Committee was formed with the specific objective of harmonizing energy actions in the framework of the poverty reduction strategies. The CNME gathered together 11ministers, local authorities, clients associations, private enterprises, financing institutions, donors and NGOs.
8.7.3 Domestic Energy

Several inter-ministerial committees have been created to deal with specific domestic energy issues in Niger. Most actives are: the CNEDD - Conseil national pour l'Environment et le Development Durable (National Council on environment and sustainable development), the CSN - Conseil National Solaire (National Solar Council), the National Electricity Committee and the National Committee of concertation on domestic and alternative energies.

The specific objectives guiding the domestic energy policy in Niger are (ESMAP 2004 and PREDAS):

- to limit the environmental degradation due to the exploitation of fuelwood, especially in the most fragile zones.
- to ameliorate the community management of local forestry resources
- to give a greater part of the advantages of the commerce of fuelwood to rural communities
- to promote better usage and acquisition of alternative fuels
- to promote the use of local produced energy resources

8.7.4 Fossil Fuels

SONIDEP is the state-owned company, founded in 1977, that has the exclusive authorisation for the international trade in fossil fuels and owns the necessary storage facilities. In the original government's plan, back in 1996, SONIDEP should have been privatized in the period between 1997 and 1999. The privatization has never been finalised due to the lack of interested investors. In the retail sector several companies offer their services, the principal ones are Tamoil, Mobil and Total covering 67% of the market.

8.7.5 Electricity

The Société Nigerienne d’Electricité (NIGELEC) is the state-owned company that produce, transmit and distribute electric energy. Most of the electrical power is imported from Nigeria’s National Electric Power Authority (NEPA) via a 1332 kV interconnection. NIGELEC also purchases power from the Nigerienne du Charbon d’Anou Araren (SONICHAR). Niger has also been part of the West African Power Pool Agreement (WAPP) set out to interconnect the power grids of West African countries.
8.7.5.1 Structure of the Electricity Industry

At present, the structure of the electricity industry is a state-owned monopoly. The (NIGELEC) handles all the steps of the electricity chain (with the exception of the energy produced for the mines by SONICHAR). Independent Power producers are foreseen by the chapter 6 of the electricity bill of 2003, but not yet implemented.

8.7.5.2 Ownership of the Electricity Industry

NIGELEC was one of the 12 state-owned enterprises whose privatization was foreseen by the Enhanced Structural Adjustment Plan back in 1996. The original plan was to privatize the company in the period 1997-1999 but this proved unfeasible. At present the privatization of the electricity company (NIGELEC) has been delayed mainly due to the difficulty in finding private companies ready to invest US$60-100 million required for expansion and rehabilitation of the power system. (IMF art.4 consultation report, Jan 2007). The government of Niger however decided against the privatisation of the electricity and fuel distribution utilities in 2007 based on a World Bank agreement that rendered privatisation reforms unnecessary.

8.7.5.3 Regulation of the Electricity Industry

The regulation of the electricity industry is mainly between the duties of the Ministry for Mines and Energy. The Government directly controls NIGELEC, the formulation of policy objectives, the development plans, the tariffs, the authorisations, the technical aspects. The Multisectorial Regulation Authority has more a control role, and much less effective powers.

8.7.6 Energy Poverty policies

The PRSP recognize the importance of energy in the development process and in the strategies to reduce poverty. However, there are no detailed strategies or action plan for the energy sector within the PRSP itself. The priority objectives for energy are the following (from Energy Poverty action plan):

1. To reform the electricity sector in order to let the private sector participate to the economic development
2. To promote social justice between urban and rural areas regarding the access to modern energy sources
3. To ameliorate domestic energy efficiency
4. To provide electricity at least-cost for commerce and industry
5. To attract risk capital for oil exploration

More specifically, the PRSP considers energy on three aspects. Firstly there is the contribution of the energy sector to the overall economy of Niger, in particular the contribution that has the important mining sector. In this sector the strategy has been to diversify production and lower the costs of extracted uranium. Secondly, there is the improving of the electrification coverage rate and access rate, decreasing fuel wood consumption, and strengthening the legal and institutional framework (PRSP report 2005).

The following results have been achieved:

- Electrification of 65 new localities under the PS/PR, bringing the coverage of localities to around 2 percent.
- Raising the electricity access rate to 8.1 percent (compared to 6.8 percent in 2004).
- Signing of a cooperation agreement with ADEME (Energy Development and Management Agency) for assistance in preparing proposals to submit to the European Union’s Energy Facility initiative to combat poverty.
- Holding of a national workshop on improving the National Rural Electrification Strategy paper and action plan.
- Validation of the diagnostic report prepared for the study on the National Domestic Fuel Strategy.
- Promotion and popularization of the use of coal by the SNCC (National Coking Company).
- Completion of energy assessments for 2000 to 2004.
- Approval of the oil exploration agreement in connection with the Kafra permit awarded to Algeria’s SONATRACH (National Company for Hydrocarbon Research, Production, Transport, Transformation, and Marketing).
- Creation of a working group to head up the establishment of an energy management office.
- Thirdly both the PRSP and the Electricity law envisage the creation of Rural Electrification bodies. The funding mechanisms leverage on each kWh sold, but it appears that this is not operative yet.
8.8 SENEGAL

8.8.1 General principles/ macro policies

Senegal’s current energy policy addresses economic, environmental and social dimensions of energy. In terms of economy, this means streamlining and improving efficiency of energy delivery – from production to consumption. Environmental sustainability is also a key objective of the policy, as is improving access to modern energy. Senegal sets itself a target of achieving 50 percent electrification by 2005 (60 percent for urban areas and 15 percent for rural areas) (Sarr et al, 2003). Current target is to also reach 62% of rural electrification by 2022 that means reaching more than 22500 new households each year, against a previous rate of growth of around 4150.

The energy sector reform began in 1997, with the issue of the letter of Development of the Energy Sector (LPDSE 1997). This document envisaged the state to reform the sector in order to eliminate inefficiencies, lower the costs for consumers and promoting investments. Consequently, energy sector reform started in the country in the following year, with several objectives:

- Create an Independent Regulatory Commission - CRSE
- Private Participation in the Electricity Industry - SENELEC
- Opening of the Electricity market to independent power producers IPPs
• Creation of a rural electrification agency (ASER)
• Creation of a Nation Hydrocarbon Committee

The privatization process of SENELEC has not been completed and after two failed attempts the state halted the process, as explained in the following paragraphs. In 2003 and in 2004 there has been an update of the energy policy objectives, with two subsequent letters of intents: LPDSE 2003 and LPDSE 2004. The revised policies take into account in a more integrated way the energy-poverty component together with economic and environmental aspects.

8.8.2 Public Institutions

Ministry of Energy

The activities of the Ministry are regulated by the decree 2003-72. The Ministry is responsible for underground and underwater explorations, international procurement of energy sources and its related public enterprises, implementation of NEPAD energy policies and to execute energy policies decided by the President of the republic, as well as the standards applicable to the sector. The principal activities are developed through The Energy Directorate. The Minister grants the licences and concessions, after assent of the Commission of regulation of the sector of electricity.

The activities of the Energy Directorate are regulated by the decree 2003-358 of the 26 of May 2003. The Directorate has several responsibilities that space from administrative to policy formulation and control, and between them:

• to develop and follow the execution of the energy development plans and programs
• to develop and follow the executions of rural electrification programs, together with the concerned institutions
• to instruct the authorisations for fossil fuel explorations
• to follow the establishment and publication of the structure of fossil fuels prices
• to assure the procurement of fossil fuels for the internal market
• to assure the liaisons with the sub regional institutions working in the energy field
• to promote renewable energy and energy savings measures
• to assure technical and administrative control for fossil fuel commercialisations
• to follow, together with the Regulatory Commission of Electricity the implementation of the electricity contract
• to follow the sector of domestic energies together with local authorities

**Energy Sector Regulatory Commission (CRSE)**

The Commission was created by the law 29 of 14 April 1998 as an independent regulatory commission with the following responsibilities:

- **Sector regulation:** CRSE has a control role to assure the protection of consumers and the respect of contractual obligation by the electricity operators. It fixes both the rights and obligations of the electricity enterprises and of the consumers.

- **Specific Decisions:** One of the most crucial responsibilities of the CRSE is the **fixation of tariff level and structure**, and their mechanisms of revision. Besides that CRSE can take decisions on a variety of other specific subjects, from the concession or licensing, to the respect of the agreements, the respect of concurrence and the respect of technical and safety rules. CRSE can apply sanctions in case of irregularities.

- **Consultative Body:** CRSE gives advises and formulate proposal to the Ministry, and contributes to the fixation of national electricity policies.

CRSE has wide investigation powers, but its importance is restricted, however, as a result of the failure of privatisation of SENELEC. The Commission is also important in determining the security of investments in the electricity sector of the country. The Commission has three members, a pool of experts and a secretariat. The commission has decided in 2002 to authorise an augmentation of tariffs of 10%, but the following year refused to give its approbation to a further augmentation of 7.25%.

**Agence Senegalaise d'Electrification Rurale (ASER)**

ASER was created with the decree n. 1254 of the 30 December 1999 as an autonomous Agency of the Minister of Mines and Energies. ASER is responsible for the government ambitious program to bring electricity to 70% if the people residing in the rural areas within 15 years through technical and financial aid. ASER deals with different activities:

- **Priority Programs of Rural Electrification (PPER)** - The unconnected territory is divided into 18 concession zones to be assigned to private companies. The contractual terms will be supervised by the CRSE and the action plan by ASER. Concessions will last for 25 years. The private concessionaire will have to cover 30% of the investment with private funds (of which half could be gathered on the local market), 35% of the costs will be subsidized, and the remaining 35% will be a medium-long term loan partially guaranteed by ASER itself. Three of the 18 zones have been selected for geographic information system pilot study.

- **ERIL Projects** are bottom-up projects, being facilitated, technically and financially by
ASER.

- **Procurement of financing** - The Fund for Rural Electrification FER will be the principal instrument, used partly to give subsidies directly to the concessionaries and partly to give guarantees to the financing banks. The FER will be founded by cross subsidies (a leverage on each kWh sold by SENELEC), plus an annual subscription by the State, plus International donors.

- **Control of electrification activities**: ASER will promote multi sectoral productive uses of energy, and privilege the uses of energy more in line with the objective of reducing the poverty.

**Map 2: Rural Electrification Concessions. Existing lines marked red. (Source ASER)**

ASER is currently collecting data on rural villages that include the identification of villages with more than 1,000 inhabitants and their proximity to a voltage grid, availability and location of village utility infrastructure, existing structure classification, assessment of energy demand, and the relative wealth of the local population. This information is being incorporated into the GIS database and will be used with the technical and economic analytical model ASER is developing. This will help determine the
type of electrical connections to be installed, such as connecting to the national grid or implementing a decentralized solution like installing a micro-power station or an individual solar electricity system. The GIS will also be used in determining the rural electrification implementation schedule.

The potential impact of electricity in the rural areas of Senegal is enormous. The expectation is the transformation of villages stimulating a lasting effect on the country in the long term.

8.8.3 Electricity Industry

8.8.3.1 Structure of the Electricity Industry

In 1999, Senegal sold 34% of the shares of SENELEC to a consortium of Hydro-Quebec (Canada) and Elyo (France) who gained full control. Shortly after, the state re-acquired the shares as the consortium did not prove able to increase the generation capacity. A second attempt at privatisation was initiated shortly after, with Vivendi International (France) and AES (USA) but the process was terminated in 2002. At present, SENELEC is a vertically integrated industry covering generation, transmission and distribution. SENELEC however does not hold monopoly over generation or distribution. SENELEC buys electricity from the following Independent Power Producers (IPPs):

- Greenwich Turbine (56MW)
- Dakar Power (56 MW + 56MW)
- Hydro-Quebec (37 MW)

Independent distribution networks are foreseen to enhance the access in rural areas, through the Agence Senegalaise d’Electrification Rurale - ASER.

8.8.3.2 Ownership of the Electricity Industry

Senegal received independence from France in 1960 and it was only in 1966 that the country started the electricity industry. Between 1966 and 1982 the State progressively took control over the entire electricity industry. In 1983, SENELEC as the State owned monopolistic company was established with the law 83-72 of 05/07/1983. After 15 years of public management in 1998 the sector started to reform with two acts (98-29 and 98-06) that transformed SENELEC in a stock company and created a Regulatory Commission of the Electricity Sector (CRSE). In 1999, through a tender process the shares of SENELEC have been divided in: 41% the State, 10% Company employees, 15% floating on the local stock exchange (Bourse Regional des Valeurs Mobiliares) and 34% to a consortium of Hydro-
Quebec (Canada) and Elyo (France) the latter being a subsidiary of Suez Lyonnaise des Eux. The Consortium however gained full management control. In September 2000, the State re-acquired the shares of the consortium as it was not able to increase the generation capacity as specified in the contract. After a while, a second tender was issued and two companies were short-listed, Vivendi International (France) and AES (USA) but the necessary agreement was not concluded, due to the financial difficulties of the two companies. In August 2002 the Government of Senegal stopped the process of privatization.

8.8.3.3 Regulation of the Electricity Industry

The regulation of the industry is set by the Ministry of Energy and Mines, and the Regulatory Commission of Electricity Sector (CRSE). The Ministry is responsible for standards applicable to the sector. The Minister grants licenses and concessions, after assent of the Commission of regulation of the electricity sector. In addition to the rational development of the electricity sector, the CRSE (see section 2.4.2) also aims to achieve the following:

- Take care of the economic and financial equilibrium of the sector of electricity and of the safeguarding of the economic conditions necessary to its viability;
- Ensure the conditions of financial viability of the companies of the sector of electricity, while allowing them to release a normal rate of profitability of their investments; and
- Promote the competition and the participation of the private sector in the field of the production, transport, distribution and sale of electric power.

8.8.4 Household Energy

There exist several programs in the household energy sector.

The Sustainable and Participatory Energy Management project - PROGEDE (IDA $5.2 million; DGIS $8.8 million; GEF $4.7 million) was implemented by the Government of Senegal between 1997 and 2004 with the objective of improving the management of wood resources, limiting their use through energy savings measures and improving the capabilities of the public sector to effectively coordinate and control the sector. The Sustainable Woodfuels Supply Management Component of the project directly benefited some 250,000 people – equivalent to approximately 21% of the population in the Tambacounda and Kolda regions – and an estimated 100,000 urban charcoal-consuming families. This component achieved establishment of sustainable community managed forest systems, creation of the community-managed buffer zone around the Niokolo-Koba
National Park amongst others. The ‘Traditional Biomass Energy and Poverty Alleviation’ benefited participating rural communities and NGOs in implementing natural resource management, marketing of woodfuels and multiple other non-wood products. It also helped in the establishment of community base micro enterprises. The programs had a high turnover of participation of women. The Demand Management and Inter-Fuel Substitutions Options Component directly benefited some 250,000 families (30%) in the principal urban and peri-urban areas of the country, with a particular health (reduced in-door pollution) and time saving benefit to women. It also benefited several hundred urban-based traders including charcoal wholesalers, charcoal retailers and stove artisans (PROGEDE Brief).

The Regional Programme for the Promotion of Household and Alternative Energies in the Sahel (PREDAS): Implemented by CILSS (Permanent Inter State Committee for Drought Control in the Sahel) and the Sahelian States, with the support of the European Union and the German Cooperation, PREDAS is a Sahel wide policy project with the aim of improving domestic energy management in CILSS member states, through the elaboration of appropriate domestic energy policies, experts networking and capacity building. The overall objective of PREDAS is to contribute to research for sustainable management of natural resources on one hand and to reduce poverty in the Sahel on the other. The specific objective of PREDAS is to create a framework for organised and sustainable management of household energy resources by ensuring the poorest populations have access to fuelwood supply and alternative energies at the least cost and in a sustainable manner. In order to reach these objectives PREDAS has been undertaking a certain number of activities whose main points are as follows : a) help the CILSS member States to conceive, adopt and implement their household energy strategies (SED); b) form a network of Sahelian experts in household energy and develop a Household Energy Technology Information System (SITE); and c) help the CILSS member States develop and promote a monitoring system for the woody resources available in the wood / energy supply basins for the major towns in the Sahel.

PERACOD is a programme of rural electrification and sustainable procurement of domestic energies, with the support of the German cooperation.

8.8.5 Renewable energies
Several policies and projects are specifically targeted to the promotion of renewable energy sources in Senegal such as (Sada 2005):

- The law 81-22 (25 June 1981) set fiscal advantages for solar and wind energy
- Note 0706/DGD/DERD /BE1 other fiscal advantages for solar equipment
• Decision 29/MEMI 21 April 1999: creation of an office for quality control of photovoltaic solar systems

There have been several solar energy projects such as:

• Saloum islands solar electrification, in collaboration between ASER and Japanese cooperation
• ATERSA/ASER implemented with Spanish cooperation
• ALIZES Senegal project - dedicated to wind energy for water pumping
• The PRS - Regional Solar Project in collaboration with CILSS
• Multi Functional Platforms: originated in Mali the MFPs have a strong gender component and are based on basic and robust technology to give mechanical energy to isolated villages

8.8.6 Fossil Fuels -

The Butanisation program

Senegal has become at the centre of interest of energy policy research for its "butanisation" program that started in the 70s and made Senegal the country in the region with the widest use of Liquefied Petroleum Gas in household appliances. The program started in response to the halting of deforestation induced by the exaggerated pressure of the growing population on the environment. The program started setting a price and subsidies structure, and was revised several times during the years. The State subsidised the gas bottles of 2.75kg and 6kg while larger bottles remained at market prices. The subsidies helped to create a considerable large market, and were funded by higher taxes on other oil products. Home appliances have been developed and an entire industry ecosystem has grown together with the impressive grown of use of GPL in the country. Recently the state has suspended 80% of the subsidies and the GPL market has seen a first contraction in 30 years.

8.8.7 Energy poverty Policies

The PRSP was presented in 2002. The Matrix of Measures (2003-2005) contains a sub sector dedicated specifically to Energy containing actions to be taken in the following fields:

a. development of production capacities (promotion of electric power use in productive activities)

b. development of energy infrastructures and services through involvement of the private sector, village associations and local authorities;
c. ensuring the financing of development activities for the energy subsector;

d. diversification of energy sources through an establishment of niche market sources, promotion and development of renewable energy and integration into rural development, promotion of kerosene and solid fuels, and the exploitation of biomass.

e. improvement of and ensuring the population’s access to household fuels: mainly targeted through the construction of charcoal terminals, outreach campaigns for rational energy usage, access to domestic fuels, and the establishment of fund for efficient cooking equipment.

f. strengthening of rural electrification: to be targeted through the expansion and promotion of rural electrification, and the electrification of education and health infrastructures.

To achieve these objectives the priority action plan allocated for the years 2003-2005 about 57 millions of Euro, 20% from the Government of Senegal and the others provided by other donors.

PRSP highlights the role of energy services in reducing the poverty but as with other countries in the Sahel, there are no direct linkages. The 2006 PRSP report does mention that energy is considered a strategic sector and is an important instrument in fighting poverty as it impacts a variety of sectors. Although, there is mention that initiatives are taken in a multi sector committee charged with drawing up a synergy strategy between energy and other sectors in the fight against poverty, there are no concrete results yet. ASER has launched the PREMS (Multisectoral energy projects) to identify the energy needs of the poor and link energy provision with income generating activities.
8.9 THE GAMBIA

8.9.1 General principles/ macro policies
Before 2005 there was no energy policy in The Gambia (UNDP, 2005). The energy sector was managed by policy statements and pronouncements, and decrees from various government departments with no coherent approach. The creation of a National Energy Policy (NEP) in 2005 aims to remedy this, and has the following objectives:

- Improve and expand existing energy supply systems through private sector participation;
- Provide an impetus to socio-economic development through enhanced productive use of energy in industry and in rural areas;
- Reduce the Gambia’s dependence on imports of petroleum products for energy supply;
- Minimise environmental impacts of energy supply through the promotion of more environment-friendly energy supply sources such as renewable energy and natural gas;
- Strengthen institutional and human resource capacity and enhance R&D;
- Provide adequate energy security; and
- Ensure an effective institutional framework for the Energy Sector.

By the end of 2005, the following actions had been achieved:
- A multi-sectoral regulatory agency had been established
- Electricity law enacted
- Petroleum act enacted, to encourage hydrocarbon exploration and exploitation
• Commencement of a scoping study to establish a Rural Energy Service Agency using EU funding.

8.9.2 Public Institutions
The management and administration of the energy sector is handled by the Energy Department, under the Office of the Presidency. The institutions and their responsibilities are summarised below:

Table xxx: Energy Sector Institutions in the Gambia

<table>
<thead>
<tr>
<th>Institution</th>
<th>Main Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Department (Office of the President)</td>
<td>Energy Policy Formulation, planning and monitoring</td>
</tr>
<tr>
<td>Gambia Renewable Energy Centre (GREC), Energy Department</td>
<td>Renewable energy research, development and promotion</td>
</tr>
<tr>
<td>Petroleum Commission</td>
<td>Promotion of Gambia’s petroleum resources to external investors</td>
</tr>
<tr>
<td>Gambia National Petroleum Company (GNPC)</td>
<td>Oil and gas exploration and development, import of petroleum products and marketing</td>
</tr>
<tr>
<td>NAWEC</td>
<td>National Utility for producing and selling water and electricity</td>
</tr>
<tr>
<td>Dept. of Forests</td>
<td>Managing the nations forest resources</td>
</tr>
<tr>
<td>Department of State for Finance, and Economic Affairs (DOSFEA)</td>
<td>Pricing of petroleum products</td>
</tr>
<tr>
<td>Department of Community Development (DCD)</td>
<td>Research, promotion and development of appropriate and efficient fuelwood stoves.</td>
</tr>
</tbody>
</table>

Source: (UNDP, 2005)

8.9.3 Electricity
8.9.3.1 Structure of the Electricity Industry
NAWEC is the main producer, and distributor, of commercial electricity throughout the country. It is a vertically integrated company and single buyer for IPPs. The current generation profile for is given in table 6 below, other little generators are in use but these are not connected to the distribution network.
### Table xxx: NAWEC generation capacity in the Gambia

<table>
<thead>
<tr>
<th>Power Plant</th>
<th>Capacity (MW)</th>
<th>Fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rated</td>
<td>Actual</td>
</tr>
<tr>
<td>Kolu</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>Basse</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>Bansang</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>Jangjanbureh</td>
<td>0.27</td>
<td></td>
</tr>
<tr>
<td>Mansakonko</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Farafenni</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Kerewan</td>
<td>0.142</td>
<td></td>
</tr>
</tbody>
</table>

*Source: (UNDP, 2005)*

The Government of Gambia also commissioned to the Global Trading Group, a private company, a 25 MW power plant at Brikama.

### 8.9.3.2 Ownership of the Electricity Industry

The government owns the electricity utility NAWEC. This was incorporated as a company limited by shares under the Companies Act in May 1995. The share capital of the company is Dalasis 100,000,000.00, with shares being valued at D10 each. The Social Security and Housing Finance Corporation, Gambia Ports Authority and Gambia Telecommunications Company each hold 1% of the shares, with the remaining 97% being held by the government.

Gampower is an IPP which was set up in 1997 and owns and operates a 8.5MW power plant. Gampower is jointly owned by NAWEC and SOGEA. All output from the plant is sold to NAWEC through a power purchase agreement. Another IPP which has recently started trading appears to own and operate three 6.8 MVA generators at a newly established power plant in Brikama. However, at the time of writing it is unclear what agreement exists between the owners and NAWEC to sell and distribute the generated power (Sillah & Sarr, 2006).

Gambia has plans to privatize NAWEC together with other state owned companies. The government set up a Gambia Divestiture Agency to dismiss state participation in several
enterprises, between them also The National Water and Electricity Company NAWEC, whose ownership is at 97% owned by the government.

8.9.3.3 Regulation of the Electricity Industry

A public utilities authority was established in 2001. In 2005 a National Energy Policy (NEP) has been approved. The most important measures contained therein are:

- a new electricity law
- a new petroleum act
- a multisectorial utility regulatory agency
- preparation of NAWEC for privatisation (public-private partnership);
- establishment of a rural electrification agency;
- creation of a National energy commission;
- new legislation on fuelwood energy, renewables and energy efficiency.

8.9.4 Household Energy

The vast majority of household energy comes from biomass, specifically fuelwood. Administration of the forestry resource falls under the auspices of the Department of State for Forestry, Natural Resources and the Environment (DOSFNRE). The Forestry Act of 1998 and Forestry Policy (in operation since 1995) set out how forestry practice should be regulated and administered. The Forestry Act lays down a legal requirement that all producers and vendors of fuelwood should posses a license to operate and a permit to harvest fuelwood. Furthermore, the Act only allows dead trees to be cut and regulates the number of employees each license holder is allowed to have.

Renewable energies such as wind power for water pumping and solar electricity for lighting and refrigeration are unregulated, and are hampered by poor equipment and high cost -exacerbated by the continued decline of the national currency versus the US dollar.

The fuelwood market is de facto controlled by the Fuelwood Vendors Association FVA established in 1996. The price of fuelwood is uniform throughout the country
8.9.5 Fossil Fuels

The Gambia is heavily dependent on imports to meet its petroleum needs, in 2004 the country imported 113 million litres of petroleum products. The sector is unregulated, and relies on goodwill and good practice by the two major companies in the sector; Total Fina ELF and Shell. The government does however utilise a price formula to maintain market stabilisation (UNDP, 2005), this is controlled by the Department of State for Finance and Economic Affairs and the Customs Department. Taxes vary greatly between products. Kerosene is subsidised, LPG has no taxes and other fuels may reach up to 40% of taxes.

8.9.6 Energy Poverty policies

A recent paper written by the UNDP and the Economic Community of West African States (ECOWAS) set out the contribution energy services can make to the Millennium Development Goals, and specifically the progress of efforts to provide access to energy services in the Gambia. These are centred on the Gambian Poverty Reduction Strategy Plan (PRSP) which is discussed below.

8.9.6.1 Overall PRSP objectives

The PRSP describes a country’s macroeconomic, structural, and social policies and programs to promote growth and reduce poverty. They are prepared by governments through a participatory process that involves civil society and development partners (including the IMF and World Bank), and provide a basis for international debt relief and financial assistance. Under the IPRSP 2000, three specific actions for the energy sector were indicated:

- Prepare an energy sector policy inclusive of sustainable fuelwood production from forests and woodlands.
- Promote solar energy and other alternative sources; and
- Establish regulatory framework for electricity power sector, including the introduction of independent power providers.

The Gambia’s PRSP which was compiled in 2002, and incorporates the SPA II, does not mention energy as one of its priority sectors (these are health, education and agriculture), instead energy is only mentioned in passing. Many of the targets in these sectors do not require the direct contribution of energy services to be met, hence a lower focus on energy provision than one would have otherwise expected given the high rate of demand, variability of supply and low rate of connections, especially in rural areas. For instance, in the agricultural sector emphasis is placed on the need to construct adequate irrigation facilities, to research different seed varieties, and to improve soil fertility.
However, energy is mentioned as a sub-heading in the Government’s 2004 Annual Progress Report (IMF 2006). The PRSP states ‘The decline in electricity services coupled with increased fuel wood consumption over the last two years has resulted in low economic activity, less employment opportunities and hence increased poverty especially in rural areas’. But, as the IMF notes: However, the PRSP fails to present a clear strategy for infrastructure development, including in such key subsectors as energy and water. The costing of the PRSP, nonetheless, point to plans to commit approximately 13 percent of the 2004 budget to these two subsectors (IMF 2002)

The PRSP identifies a number of energy options which would contribute to efforts to alleviate poverty. But, these lack focus and the PRSP does not appear to put in place clear plans for achieving them. Again, the IMF notes that overall, the energy situation has not improved since 2002 but instead the energy problems have worsened making energy a priority for any meaningful socio-economic advancement in the country. According to the Energy Balance 2002, 83.42% of energy consumed comes from fuel wood, 13.86% comes from petroleum products, electricity accounts for only 2.34% and LPG and renewable energy account for less than 1%. The decline in electricity services coupled with increased fuel wood consumption over the last two years has resulted in low economic activity in the rural areas. (IMF 2006)
9. Conclusions

Provision of affordable, reliable and sustainable energy services is central in any strategy aimed to pursue the reduction of the poverty and economic development. Sahelian countries have all undergone in recent years a process of reform of their energy sector and in some cases energy has been considered as a key factor in the Poverty Reduction Strategies.

The process of reforms in Sahel suffered many obstacles: from nine countries starting only one completed (Cape Verde) but presenting severe dispute between the government and the energy and water utility about the fixation of tariffs and the investment plans. Other two countries, Mali and Senegal, reversed the process and regained control of the sector, at least for the moment. In both cases disputes arose between the new buyers and the governments about the amount of investments, the quality of the service and tariff adjustments. In all the other countries the privatisation of the energy sector, even if planned, has not been for the moment completed essentially for the difficulties in finding private sector partners interested in so little and difficult markets and available to commit themselves with huge investments of uncertain return. As a matter of fact the only company successfully privatized has been acquired by the national semi-public electric and water utilities of the ex-colonial power.

Several innovations have been done especially on the regulatory sector of electricity, and in several countries various Regulatory Bodies have been established, defining better the relationship between the State, the public utilities and the consumers. A truly independent regulatory body is central for the correct functioning of a multi player system, and plays a key role in defining a sustainable and fair tariff system for all the subjects involved.

The initiatives taken at the national level to specifically address the energy poverty varies from state to state. Certain Countries are carrying several programs on this specific issue, establishing rural electrification agencies, cross subsidies schemes, decentralised electrification and specific pro-poor tariffs but for others the situation not yet improving. The importance of regional approach, like the one proposed in the framework of UEMOA/ECOWAS, and of cooperation between countries is evident as it is evident that to reach the objectives fixed by NEPAD, ECOWAS and the MDGs much effort has to be done. In particular the process of reforms of the sector has to be shaped on the particular energy and development needs of the different countries and must cooperate with the poverty reduction strategies and not the contrary. To achieve both the Millenium Development Goals and the related energy objectives, African Countries need consistent financial support.
from the donors, good governance, political commitment and the ability and possibility to transform good plans in good projects that will help the life of millions of poor and boost the development of the countries.
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   Country Report No. 04/182
   2005, IMF Country Report No. 05/439


**MAURITANIA**


NIGER

Statement; Public information Notice and Press Release on the Executive Board Discussion; and Statement by the Executive Director for Niger


Website References
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Websites

1. SENELEC - www.senelec.sn
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THE GAMBIA

8. KITE (2005?). The Gambia. Country Report for regional policy based on “increasing access to energy services for populations in rural and sub urban areas in order to achieve the millennium development goals” prepared by KITE for UNDP-REPP and ECOVAS


Annex I

ENERGY POLICY SURVEY - INTELLIGENT ENERGY FOR SAHEL PROJECT

QUESTIONNAIRE INSTRUCTIONS

The questionnaire is divided in three parts:

A) Energy Policy Framework
B) Energy Statistics Indicators
C) Renewable Energies Status

For each point of the correspondent questionnaire please provide the source(s) of the information and, if possible, include an electronic copy or photocopy of the source. If there is any doubt concerning this questionnaire please send an email to ie4sahel@energyprojects.net and you will receive an answer from the project consortium in the next working day.

SUPPORTING DOCUMENTS

Please provide a copy (digital copy or photocopy) of the following documents: (Note that the title of the document could be different for each country, in case of doubt please send an email to ie4sahel@energyprojects.net).

• **Household Surveys** (any survey directly referred to the household situation, it should include consumption and energy surveys for each income group).

• **Poverty Surveys** (the study that defines national poverty line(s) and describes the poverty situation in the country). It should have been prepared in the Poverty Reduction Strategy Papers Process.

• **Energy Utility Balance Sheets.** In particular if they contain data about cost, investment, revenues, subsidies from the states, debt, financing and estimates of the amount of unpaid electricity bills.

• **Energy Poverty Action Plan** and/or **Rural Electrification Programme**, if present.

• **List of international agreements** related to energy ratified by the country (including regional agreements, energy pools, AFREC African Energy Commission etc.)
A. ENERGY POLICY FRAMEWORK

1. THE ELECTRICITY SECTOR

Production

1.1.1 List the main (> 5 MW) electric energy production plants operating in the country. For each one please list:
   a) Name and location
   b) Year of construction
   c) Installed capacity (MW)
   d) Energy produced (GWh per year)
   e) Type of technology and fuel
   f) Property (State utility, municipality, local communities, Independent Power Producer etc.)
   g) Energy destination (national grid, mini grid, industrial use, others)

Please use as a reference the excel table 1.1.1 annexed

1.1.2 If Independent Power Producers are present, please indicate if the energy is produced for (industrial use / mini grid residential / the national grid / others)

1.1.3 If the energy is sold to the national grid, please indicate the terms of the Purchase Agreement (tariff, duration, etc.)

1.1.4 Other issues: production is able to satisfy demand? Are there any production constraint issues?

1.1.5 Is there any project development in the energy production? (new plants being planned or built, restructuring old ones, etc.) Please indicate each case and, if possible the same data as in 1.1.1

1.1.6 Subsidies: are there any subsidies to the production of electricity? If yes, please describe them.

1.1.7 Other relevant issues.

Transmission

1.1.8 Indicate how many transmission entities are operating in the country for each indicate also property (state utility, municipalities, private sector etc.) and extension (km)

If transmission and production are operated by different entities, please indicate their relationship, in particular:
   a) At what price/quantities electricity is purchased?
   b) Who is in charge of the decision?
   c) Who is in charge of dispute settling?
1.1.9 Are there any Hi-Voltage electrical lines connecting with neighbouring countries?

1.1.10 If yes, please indicate partners, prices, quantity and direction of trade. In case of long term contract, please indicate duration (and dispute-settling body).

1.1.11 Other issues: loss in transmission. Is there any indicator for the loss in transmission? (please provide data for several years if available) Is there any action to reduce loss in transmissions?

1.1.12 Extension of transmission network. What have been the developments in the last 10 years? (km per year). If possible, provide data for hi and medium voltage lines. Is there any project to develop the transmission infrastructure, both internal or interconnecting to other countries? If yes, please describe them including financing aspects.

1.1.13 Subsidies: are there any subsidies to the transmission of electricity? If yes, please describe them.

1.1.14 Other relevant issues

**Distribution**

1.1.15 How many distribution entities operate in the country?

For each indicate:
- a) n. of customers / households served for each region / district
- b) if possible indicate (poor / non poor) and (urban / non urban) share in each geographical district
- c) Property (State, local communities, private sector, other...)

1.1.16 If property is different than transmission entities, please indicate the relationship between them, in particular:
- a) at what price / quantities energy is purchased?
- b) who is in charge of the decision
- c) who is in charge of the dispute-settlement?

1.1.17 How is composed the electricity tariff? Please describe it providing details:
- a) by user group (industrial / commercial / residential / state / social / special customers / other...)
- b) by areas (urban / rural / special areas)

1.1.18 Electricity ratio (household or population with electricity on total household / population)
1.1.19 Rate of electrification (new customers-connection every year / n. of total
customers -connections)

1.1.20 Is there any data regarding the theft of electricity (number of illegal connections)?
Has been some policies put in place? By whom? With which results?

1.1.21 Is there any programme / agency promoting rural electrification and/or access
by the poor? (even by the private sector / NGOs / local communities etc.)

1.1.22 If yes, please describe it, indicating also date of creation, financing, objectives and
results.

1.1.23 Subsidies: are there any subsidies for final customers of electricity? If yes please
describe them.

1.1.24 Other relevant issues

1.4 Regulations

1.4.1 Please indicate which authorities are in charge for setting up the rules for
a) electricity tariff, setting and readjustment;
b) licensing of new production plants;
c) international electricity trade, if present;
d) settle conflicts between different companies operating in the electricity sector (if more
than one company is present);
e) settle conflicts between consumers (including the state) and the electricity companies.

1.4.2 If an independent “regulatory authority” has been created, please indicate date,
legal status, composition and modality of appointment of the executive board with
special attention to the relative autonomy with respect to the State and to the electricity
industry.

1.4.3 If there have been changes in internal regulations in recent years, please indicate
them and describe the situation pre and post reform.

1.4.4 Other relevant issues

1.5 Reforms (Ownership/Management and Structure)
1.5.1 Have reforms been put in place regarding Ownership / Management / Structure / Regulations in the power sector in the last ten years?

1.5.2 If yes, please indicate "objectives of the reform" as stated in the legal documents / speech in the parliament / international donors documents. Indicate also the foreseen timing of the reform (date of entry into force of each step, as planned and

1.5.3 Ownership

Please indicate if in recent years there have been changes in the ownership / management of the electric industry.
In particular indicate the status before and after the reform, if it possible identify with one of the following categories:
- a) Government Department or Ministry;
- b) Governed owned company - public corporation;
- c) Management contract with an external company;
- d) Joint venture with international partner;
- e) Private corporation;
- f) Other.

1.5.4 Vertical structure

Please indicate if in the last ten years there have been changes in the vertical structure of the electricity sector. If yes please describe the situation before and after the reform.
If it is possible try to identify with one of the following situations:
- a) no competition at all, a single company handles generation, transmission and distribution for the entire country;
- b) some competition in generation, Independent Power Producers allowed;
- c) competition in generation plus different distribution companies that still have a monopoly over final customers;
- d) competition at all level, all customers may choose their suppliers and different kind of contracts.

1.5.5 Employment in the electricity sector

If reforms have been implemented, please indicate the consequences of the reform on the employment.
Indicate in particular:
- a) number of employees before and after the reform in the main electric companies;
b) number of expatriate experts (consultants, directors etc.) in the management of the national electric company with permanent presence in the country.\textsuperscript{13}

c) if data is available, number of new jobs created as a direct consequence of the reform of the electric sector (like in the constructing of new lines / power plants and in manufacturing activities, new service companies etc.)

1.5.6 Financing

If reforms have been implemented, please indicate their cost and how they have been financed (grants / loans) and by whom (multilateral donors / bilateral donors / private sector / internal financing)

1.5.7 Other relevant issues

2. FOSSIL FUELS

\textbf{2.1 Production}

2.1.1 Is there any production of fossil fuels in the country?

2.1.2 If yes, please indicate:
   a) location;
   b) production / reserves by type of fossil fuel;
   c) property of the plants.

\textbf{2.2 Refining}

2.2.1 Is there any refinery plant present in the country?

2.2.2 If yes, please indicate:
   a) location;
   b) production by type of fossil fuel;
   c) property of the plants.

\textsuperscript{13} This data is particularly relevant if the electricity company has been sold, partially or totally, to a foreign-owned company.
2.3 Distribution

2.3.1 Please describe the distribution network of fossil fuels (gasoline / diesel / lpg / others) in the country.

In particular:
a) which are the companies that distribute FF?
b) the price of fuels is regulated or liberalised? Is it homogeneous in the country?

2.3.4 Does it exist a map of fuel station or distribution facilities in rural isolated areas? If possible provide it, giving details for each region.

2.3.5 If some areas of the country are not officially served, there exist informal distribution networks? Please describe the way they work, and if possible quantify the surcharge for fuel in remote and isolated areas.

2.3.6 Do exist subsidies to fossil fuels in the country? If yes please describe them.

2.3.7 Other relevant issues
3 BIOMASS

3.1 Production

3.1.1 List the main timber and non timber production projects operating in the country, highlighting:

a) Name and location
b) Year when start to operate
c) Total area (m2)
d) Volume of production (Dry tonne per year)
e) What percentage of the wood is delivered to timber and what is delivered to other uses, such as fuel wood, charcoal making, etc.
f) Property (National Private, Multinational, State owned, municipality, local communities, etc.)
g) Product destination (national market, International market, industrial use, others).

3.1.2 Timber and non timber production is able to satisfy demand? Are there any production constraint issues?

3.1.3 Is there any project development in the field of timber and non timber production? (new areas being planned or developed, reforestation projects, etc.). Please indicate each case and, if possible the same data as in 1.1.1

3.1.4 Other relevant issues.

3.2 Processing and Commercialization of Biomass

3.2.1 What is the transport and distribution structure used for biomass energy products transportation and distribution (Trucks, animal cargo, people with bags, etc).

3.2.2 How much charcoal is produced?
Which are the main production techniques? (in terms of % of the charcoal produced),
if possible split by the country main / sub-regions.

3.2.3 Is there any action to improve efficiency and/or losses in transportation?

3.2.4 The Biomass market is free or regulated?

a) which are the current prices for biomass products?

b) if the market is not free, who is in charge of the decision?

3.2.5 Are there different prices in each area/region of the country for the biomass products (fuel wood and charcoal)?
If yes, please indicate main players partnerships, prices, quantity and direction of trade. In case there any long term contract, please indicate duration (and dispute-settling body).

3.3 Employment in the wood timber and non timber production sector.

3.3.1 If the information is available, please indicate by main area / region of the country.

Number of people employed in the wood related sector, specially in terms of:

a. People in the biomass for energy production and in the timber products production;
b. People involved in the charcoal making and in the charcoal distribution network;
c. Share in each category between formal and informal jobs;

If data is available, indicate the age and gender distribution between the workers at the above cited categories;

3.4 Regulations

3.4.1 Please indicate which authorities are in charge for setting up the rules for

a) Land use and land use change in rural and peri-urban areas
b) Production of timber products
c) Implementation of wood production projects, including reforestation projects (licensing of new project, regulation, fiscalisation, etc)
d) Production of energy biomass (such as fuel wood, charcoal, bio-digesters, land gas fields, etc)

e) Setting commercialization prices and specific trades (i.e. exporting wooden products), if present;

3.4.2 What is the environmental regulation applied rural area property in respect to mandatory percentage of area designated to natural reserve and wild life presentation, and what are those rules (in terms of definitions and percentage, i.e, borders of water courses).

3.4.3 If there have been changes in internal regulations in recent years, please indicate them and describe the situation pre and post reform.

3.4.4 Other relevant issues

3.5 Other Issues

3.5.1 Is there any programme / agency promoting improved used of biomass energy products (better technologies for charcoal making, improved stoves, etc)? (even by the private sector / NGOs / local communities etc.)

If yes, please describe it, indicating also date of creation, financing, objectives and results.

3.5.2 Subsidies: are there any subsidies to the production of wooden biomass, been timber and or no timber products, in the country? If yes, please describe them

3.5.3 Subsidies: are there any subsidies to the production of Charcoal? If yes, please describe them

3.5.4 Subsidies: are there any subsidies to the use of biomass as an energy fuel? If yes, please describe them

3.5.5 Are there any LULUCF projects running or going to be implemented in the country? if yes, please list.

3.5.5 Other relevant issues