# REPUBLIC OF LIBERIA


# NATIONAL ENERGY POLICY
# AN AGENDA FOR ACTION AND ECONOMIC AND SOCIAL DEVELOPMENT

Ministry of Lands, Mines and Energy

Monrovia, Liberia

May 2009

# FOREWORD

Energy impacts all aspects of life. It impacts the quality of education and health, the welfare of women and children, and the environment. It drives economic growth and sustainable development.

Therefore, the provision of modern, reliable, affordable, and environmentally sustainable energy services is crucial to the achievement of the Millennium Development Goals and Liberia's Poverty Reduction Strategy.

The formulation of this National Energy Policy (NEP), Liberia's first, started in early 2006 with provisions in the 150-Day Plan deliverables and followed with a National Energy Stakeholders Forum in October 2006, the publication of the National Energy Sector White Paper, the interim Poverty Reduction Strategy Process, and the full Poverty Reduction Strategy.

The NEP contains our national vision in the energy sector, from the emergency phase, which is nearing completion, through the capacity building and development phases.

Through the NEP we hope to lay the foundation for the creation of an enabling environment to attract private sector capital to the energy sector, to restructure and reform energy institutions, to decentralize energy service administration, to fully utilize domestic energy resources and, most importantly, to ensure that all parts of Liberia have access to affordable and modern energy services.

The bedrock of this NEP is our national experience, the ECOWAS Energy Protocol and the collective global efforts to combat climate change events. As our contribution to ongoing global initiatives to mitigate where possible and to adapt where necessary the adverse impact of climate change due to emission of greenhouse gases, we are making a policy declaration in this NEP to drive Liberia towards a carbon neutral economy by 2050.

The challenges to achieve these objectives are nevertheless enormous, but it is the intention of the Government to use the NEP as the strategic blueprint for the implementation of its energy development programs.

We kindly request the cooperation of all Liberians as we provide "small light today, big light tomorrow."

Eugene H. Shannon, PhD
Minister
Ministry of Lands, Mines and Energy

# ACKNOWLEDGEMENT

The Government of Liberia (GOL), through the Ministry of Lands, Mines and Energy (MLME), expresses its thanks to the Government of the United States of America for providing, through the United States Agency for International Development (USAID), the technical and financial assistance for the preparation of the National Energy Policy.

We are also grateful to our other bilateral and multilateral partners, the European Commission, the World Bank, the United Nations Development Program, the Government of Norway, and other members of the Emergency Power Program Steering Committee for their inputs in the process.

The GOL also acknowledges the effort put in by the working committee in organizing the various workshops and compiling the document. Members of the committee were drawn from the MLME, University of Liberia, International Resources Group (IRG), and the Center for Sustainable Energy Technology.

Finally, we express our appreciation to all Liberians, including our people from the rural areas, who participated in the process.

# CONTENTS

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BOO | Build Own, and Operate |
| BOOT | Build, Own, Operate, and Transfer |
| BOT | Build, Operate, and Transfer |
| DoE | Department of Energy |
| DSM | Demand-side Management |
| ECOWAS | Economic Community of West African States |
| EPA | Environmental Protection Agency |
| EPP | Emergency Power Program |
| ERB | Energy Regulatory Board |
| GOL | Government of Liberia |
| IFC | International Finance Corporation |
| IMPTC | Inter-Ministerial Petroleum Technical Committee |
| IMTC | Inter-Ministerial Technical Committee |
| IPDs | Independent Power Distribution Companies |
| IPPs | Independent Power Producers |
| IPRSP | Interim Poverty Reduction Strategy Process |
| IPTs | Independent Transmission Companies |
| IRG | International Resources Group |
| kW | Kilowatt |
| LEC | Liberia Electricity Corporation |
| LNOC | Liberia National Oil Corporation |
| LPRC | Liberia Petroleum Refining Corporation |
| LRA | Liberia River Authority |
| LRMC | Long-Run Marginal Cost |
| MDGs | Millennium Development Goals |
| MLME | Ministry of Lands, Mines and Energy |
| MoF | Ministry of Finance |
| MW | Megawatt |
| NEC | National Energy Committee |
| NESF | National Energy Stakeholders Forum |
| NEP | National Energy Policy |
| NGO | Non-governmental organization |
| NOCAL | National Oil Company of Liberia |
| PAO | Principal Administrative Officer |
| PPCA | Public Procurement and Concessions Act |
| PRS | Poverty Reduction Strategy |
| PSAs | Production-Sharing Agreements |
| REFUND | Rural Energy Fund |
| RESCOs | Rural Energy Service Companies |
| RREA | Rural and Renewable Energy Agency |
| SPRA | Saint Paul River Authority |
| TVA | Tennessee Valley Authority |
| UNFCCC | United Nations Framework Convention on Climate Change |
| USAID | United States Agency for International Development |
| WAGP | West Africa Gas Pipeline |
| WAPP | West African Power Pool |

# EXECUTIVE SUMMARY

The National Energy Policy (NEP) is the product of an extensive process of consultations that started with the National Energy Stakeholders Forum (NESF) in October 2006. Recommendations from that forum were summarized in the National Energy Sector White Paper published in February 2007. After a process of scrutiny and validation involving all key stakeholders, the White Paper has now been transformed into the NEP.

***The principal objective of the National Energy Policy is to ensure universal access to modern energy services in an affordable, sustainable and environmentally-friendly manner in order to foster the economic, political, and social development of Liberia.***

Energy is an essential service that impacts all aspects of life. Consequently there is a direct correlation between a nation's level of development and its energy consumption patterns. Reflecting the country's under-developed economy, Liberia's present energy production and use is dominated by the household energy sector whose mainstay is traditional biomass energy resources. In 2004, it was estimated that over 95% of the population depends on firewood and charcoal for cooking and heating needs and palm oil for lighting. Modern energy services based on electricity and petroleum products are predominantly used for economic production and transportation. In the household sector, the use of modern energy services consists mainly of kerosene, electricity, and liquefied petroleum gas for lighting, cooking, and entertainment. These are used by higher income households in urban areas.

Addressing chronic poverty is the fundamental challenge of the Government of Liberia (GOL). The Government's overall vision and strategies for poverty reduction are outlined in the Poverty Reduction Strategy (PRS) for the period July 2008 to June 2011 which builds upon the 150-Day Plan of January 2006 and the interim Poverty Reduction Strategy Process (IPRSP) for the period July 2006 to June 2008. Both documents are built on four pillars – (1) consolidating peace and security; (2) revitalizing the economy; (3) strengthening governance and the rule of law; and (4) rehabilitating infrastructure and delivering basic services. The development of the NEP is an essential exercise towards the realization of the goals and objectives of the PRS as well as contributing to the achievement of the Millennium Development Goals (MDGs).

The NEP assumes the implementation of proposed energy sector reforms founded on three essential features: (1) demonstrating the Government's resolve for good governance and ensuring financial transparency in all sector transactions; (2) overcoming the significant obstacles to private sector investment in energy supply; and (3) creating the requisite institutional and legal framework and an independent regulatory regime. In undertaking energy sector reform, the Government will also be addressing a key component of Liberia's commitment to the World Bank and other donors for debt relief under the program for Highly Indebted Poor Countries.

## KEY POLICY ISSUES

The NEP addresses the following strategic issues that are implied in the principal policy objective – ***access, quality, cost, and institutional framework***. These issues refer to the need for the various technologies and delivery options for energy products and services to be ***available, acceptable, affordable, and adequate***.

## ACCESS

***The policy objective is to ensure availability of modern energy services for all Liberians, in both the urban and rural areas.***

Currently, about 10% of urban residents and less than 2% of rural residents have electricity access largely from self-generation using expensive imported fuel. **By 2015,** in line with the Millennium Development Goals as adopted by the Economic Community of West African States (ECOWAS), the Government expects to achieve the following goals:

- 40% of Liberian citizens living in rural and peri-urban areas and using traditional biomass for cooking shall have access to improved stoves and kerosene or efficient-gas cookers in order to reduce indoor pollution;
- 30% of the urban and peri-urban population shall have access to reliable modern energy services enabling them to meet their basic needs (lighting, cooking, communication, and small production-related activities);
- 15% of the rural population and 25% of the schools, clinics, and community centers in rural areas shall have access to modern energy services to meet the same basic needs.

**Beyond 2015,** the long-term strategy is to make Liberia a carbon neutral country by 2050. The GOL will seek to leverage the country's biomass and water resources as sources of carbon credits for energy development. The GOL will promote the use of renewable energy such as solar and wind systems in power plants and all large commercial facilities such as supermarkets, hotels, restaurants, entertainment centers, hospitals, and large retail shops and stores. The GOL through the new dedicated Rural and Rural Energy Agency will vigorously pursue the development of mini and micro hydro on the country's numerous rivers and streams.

It is the policy of the GOL to ensure the availability of quality petroleum products on a cost recoverable, competitive, and affordable basis throughout the nation. In the long term substitute renewable sources such as biodiesel will be employed as fuel for transportation.

## QUALITY

***The policy objective is to ensure acceptability of energy products and services by adopting standards that are consistent with international best practice.***

The GOL shall establish quality standards for all energy products and services which will be monitored and enforced by the Energy Regulatory Board (ERB) and the Bureau of Standards as appropriate; standards will be established to ensure accuracy of meters and gauges, product safety, security, reliability, consistency, purity, and availability as well as timeliness in responding to stakeholder service requests.

The GOL shall also establish energy efficiency standards for all government and commercial buildings and industrial facilities and for importation of fuel-efficient vehicles and energy-efficient light bulbs and home appliances.

It is the policy of the GOL to minimize and eliminate loss, theft, and corruption and to promote international best practices in wholesale and retail energy transactions and in the granting of licenses and concessions.

## COST

***The policy objective is to ensure affordability through least-cost production and utilization of energy services.***

Cost is the main determinant of energy access and quality. It is therefore the policy of the GOL that the development and utilization of all forms of energy shall be done on a least-cost basis. Financial, economic, social, and environmental costs shall all be taken into consideration. The GOL supports the collective global effort to control harmful greenhouse gas emissions responsible for climate change and will seek to balance the environmental costs and benefits of all energy programs. The GOL expects to achieve its access goals for 2015 while reducing greenhouse gas emissions by 10%, improving energy efficiency by 20%, raising the share

of renewable energy to 30% of electricity production and 10% of overall energy consumption, and increasing the level of biofuels in transport fuel to 5%.

The GOL is committed to the provision of energy services on a full cost-recovery basis to those who are able to pay and on a targeted subsidized basis to those who can only afford to pay a portion of the cost. This approach will ensure the long-term financial viability of energy service companies while ensuring the affordability of all energy forms for poor consumers. Prices will be set by the operators subject to costs allowed by the Energy Regulatory Board and principles set by the Ministry of Lands, Mines and Energy (MLME) to ensure universal access. The Government will establish a regulatory process for monitoring all costs – economic, financial, social, and environmental – and allocating these to the user (rate payer or polluter) or public (taxpayer) as appropriate.

## INSTITUTIONAL FRAMEWORK

***The policy objective is to establish an adequate delivery process for energy products and services through a public and private partnership where investment in new infrastructure and services is provided by the private sector to the greatest extent possible, with the public sector providing the supporting policy environment as well as regulatory oversight.***

The establishment of an independent and transparent regulatory process will be essential for the creation of an investment environment conducive to increased private sector involvement in the energy sector. **To achieve independence and transparency, the institutional framework must avoid conflicts of interest and overlapping roles by separating policy setting, regulatory oversight, and policy implementation and operations.**

The Government, through the Ministry of Lands, Mines and Energy, will define and review energy policy. The Energy Regulatory Board will monitor policy implementation by all operators, whether owned by the public sector, private sector, or local communities.

For the better exercise of its functions, the GOL will reorganize the MLME to elevate the attention given to energy and its many uses and benefits. It shall be the policy of the GOL to ensure that the Ministry's Department of Energy (DoE) is organized efficiently and resourced adequately to discharge its oversight role over all the different energy sub-sectors as well as to direct and supervise, through policy making and planning, the efficient development of the energy sector as a whole.

It shall be the policy of the GOL to balance the interests of consumers with those of firms engaged in the importation, production, transportation, distribution, and sale of energy products and services through the creation of an autonomous regulatory body, enabled by legislation, to eliminate distortions in energy-related markets through transparent, predictable and stable oversight; the Energy Regulatory Board shall be responsible for monitoring all energy policies and standards established by the MLME.

It shall be the policy of the GOL to facilitate and accelerate the economic transformation of rural Liberia by establishing a semi-autonomous agency dedicated to the commercial development and supply of modern energy services to rural areas with an emphasis on locally available renewable resources. The agency, to be called the Rural and Renewable Energy Agency (RREA), will have an operational role under the oversight of the ERB and the policy direction of the MLME. The RREA's mandate will include integrating energy into rural development planning; promotion of renewable energy technologies; facilitating delivery of energy products and services through rural energy service companies (RESCOs) and community initiatives; and facilitating the funding of rural energy projects including managing a Rural Energy Fund (REFUND) that will provide low interest loans, loan guarantees, and grants as targeted subsidies to ensure access by the poor.

It is the policy of the GOL that for the foreseeable future Government-owned energy corporations shall continue to operate but shall be restructured to remove all policy making and policy monitoring functions and to improve operational performance through sound commercial business practices. The restructuring of the MLME and the establishment of the ERB and RREA will necessitate changes to the legislation

establishing the Liberia Electricity Corporation (LEC), National Oil Company of Liberia (NOCAL), and Liberia Petroleum Refining Corporation (LPRC). Pending the review and revision of the legislation, the policy setting and monitoring functions currently being conducted by NOCAL, LPRC, and LEC staff will be transferred to the appropriate offices of the MLME, ERB, and the Bureau of Standards.

LEC shall be the national grid company with special responsibility to provide support and advice to the MLME on national power system expansion planning. Although LEC will, to some extent, be involved in distribution, the Government is considering other options, including private sector operation and ownership of the Monrovia power distribution business. The Government will encourage and support investment in the power sector by independent power producers (IPPs) and independent power transmission and power distribution companies (IPTs and IPDs). The Government will also encourage large commercial and industrial facilities to utilize co-generation schemes and to increase the scale of their power sources to provide power for neighboring communities.

In the petroleum sector the Government shall establish the Liberia National Oil Corporation (LNOC) as the Government's implementing agency for both the upstream and downstream operations. The LNOC shall be created from a merger of the operations of NOCAL and LPRC that are not transferred to the MLME or ERB. For upstream operations, the policy of the GOL is to bring the country's investment climate in line with international best practice so that the extraction of petroleum resources will benefit all Liberians and the exploration and development will be conducted in an environmentally friendly manner. The GOL, with technical and operational assistance from LNOC's upstream operations department, shall establish a fully transparent and accountable process for petroleum exploration and commercial development, with regulatory oversight by the ERB. For downstream operations, the GOL, with technical and operational assistance from LNOC's downstream operations department, shall support competitive private sector investment or participation in new storage depot management or ownership, port management, off-loading facilities for petroleum products, up-country storage depots, tankers moving petroleum products around the country, and in construction and operation of a refinery primarily devoted to exports.

It is the policy of the GOL to link its long-term energy policy with that of the ECOWAS region. The ECOWAS Energy Protocol constitutes a key building block of Liberia's national energy policy. For this reason, Liberia's goals on energy access are in line with the ECOWAS goals and will move the country toward achieving the 2015 Millennium Development Goals. Liberia will establish a Saint Paul River Authority (SPRA), modeled on the US Tennessee Valley Authority (TVA) for the development of its large-scale hydropower potential to fuel the economy and to export power to the West African Power Pool (WAPP). Liberia will also join the West Africa Gas Pipeline (WAGP) and encourage electricity developers in neighboring countries to use this gas for power generation which can then be transmitted to Liberia.

The GOL recognizes that there are areas of overlap and inter-linkage between energy and other sectors and it is therefore necessary to re-establish the National Energy Committee (NEC), in place before the civil crisis, to facilitate coordination between energy-oriented organizations in the public and private sector and developers and users of related infrastructure services. The NEC will also provide a forum for coordination among domestic, regional, and international stakeholders. The NEC will therefore fulfill the ECOWAS recommendations for member countries to set up a cross-sectoral and multi-actor cooperation mechanism equipped with the human, technical, and financial resources required to discharge its coordination mandate.

## SMALL LIGHT TODAY, BIG LIGHT TOMORROW

***The policy objective is to establish and communicate a strategic roadmap that will serve as a reference for performance measurement in the implementation of the NEP.***

The Government has adopted a three-pronged strategy towards the realization of the vision expressed by the principal objective of the NEP – the short term (**emergency phase**), the medium term (**capacity building phase**) and the long term (**development phase**). President Ellen Johnson Sirleaf, in the dedication ceremony

for the re-establishment of public power supply in Monrovia, summarized the strategic roadmap with the phrase "Small light today, big light tomorrow." This NEP paves the way from the small light to the big light.

The emergency phase was launched in January 2006 as a cornerstone of Liberia's post-conflict stabilization and redevelopment program. During this phase, several pilot projects have been implemented to serve as the foundation for the rebuilding of the country. The projects have also served to provide lessons for the development of the NEP. Over the medium term, from 2008 to 2015, the strategy is to develop the country's institutional capacity for policy implementation. During this phase, the Government will roll out and extend the emergency phase pilot projects and also facilitate the first major private sector investments in power generation. The long term, beyond 2015, will have the objective of vision realization and will be focused on the development of the country's large hydropower and other renewable resources.

# 1. INTRODUCTION

The Government of Liberia is faced with the mammoth task of rebuilding a nation devastated by 14 years of civil strife. The Government has articulated its vision and major strategies for social and economic development in the 150-Day Plan for the period immediately following the inauguration of President Ellen Johnson Sirleaf in January 2006, the interim Poverty Reduction Strategy Process for the period July 2006 to June 2008, and the Poverty Reduction Strategy for the period July 2008 to June 2011. All of these have been organized around four pillars – (1) consolidating peace and security; (2) revitalizing the economy; (3) strengthening governance and the rule of law; and (4) rehabilitating infrastructure and delivering basic services. The objective is to lay the foundation for sustained and equitable growth, poverty reduction, and the achievement of the Millennium Development Goals – a global initiative, with time-bound (2015) and measurable goals and targets for combating poverty, hunger, illiteracy, gender inequality, disease, and environmental degradation.

In the formulation of its development plans the Government has recognized that increased access to modern energy services by both the urban and rural population is one of the keys for accelerating the reconstruction and economic revitalization of the country and the achievement of the Millennium Development Goals. Energy impacts all aspects of life – health, education, economic growth, welfare of women and children, and the environment. Energy is therefore crucial for the achievement of the four pillars of the Poverty Reduction Strategy as well as the MDGs.

To transform the Government's vision for development into reality with tangible impact on the lives of Liberia's citizens, the Government has formulated the National Energy Policy to detail the actions required to enable the country's energy sector to play its strategic supporting role. The challenges involved are immense and should not be underestimated. The Government inherited a situation where there was no public electricity infrastructure or functioning utility, the petroleum company was looted and destroyed, petroleum exploration was at a standstill, and there was no coordinated energy policy and strategy. Nevertheless, it is imperative to be systematic and disciplined about energy policy and strategy implementation if the energy sector's potential and President Johnson Sirleaf's vision are to be realized. The reform of the energy sector is also a key component of Liberia's commitment to the World Bank and other donors for debt relief under the program for Highly Indebted Poor Countries.

The NEP reaffirms the Government's conviction that economic development is impossible without access to reliable, accessible, and affordable energy. Increased commercial energy access and use will contribute to the growth of Liberia's economy and improved quality of life for Liberia's citizens. Secure energy supplies and basic infrastructure are essential for Liberia's economic transformation. Adequate and reliable energy supply will allow the mining sector, industries, and commercial concerns to expand their production and sales of goods and services, and in turn increase employment. For the rural poor in the agriculture sector, modern energy access means increased productivity through improved production and processing methods, increased employment, and preservation of crops.

> Energy empowers development by enhancing the creativity and productivity of human capital. Modern energy can support the effective delivery of health and education services, increase labor productivity, and alleviate the disproportionate burden on women for water, food, and fuel supply.

The process and commitment to develop this NEP and to commence meaningful energy sector reform grew out of the National Energy Stakeholders Forum held in Monrovia in October 2006. The two-day forum, attended by nearly 300 stakeholders from all parts of Liberia, provided an opportunity for evaluating local realities and experiences. The results of the NESF were then compiled into a National Energy Sector White Paper published by the Ministry of Lands, Mines and Energy in February 2007. The White Paper contains various policy recommendations for the reform of the electricity and petroleum sub-sectors and examines

strategies to harness Liberia's tremendous renewable resources to extend modern energy services to the nation's rural population.

Using the White Paper, and taking account of regional and international best practices, a draft policy document was then developed. Three policy validation workshops were convened to provide the key stakeholders the opportunity to review and confirm the policy proposals before final drafting and publishing of the NEP. The validation workshops were held in Zwedru, Gbargna, and Monrovia and the combined attendance was nearly 450 delegates and observers. These were drawn from national and international stakeholders, many of whom were participants in the NESF and are active or interested in ensuring energy access for both urban and rural Liberians. They included senior policy and decision makers at the national, county, and district level as well as representatives of government agencies, utilities, financial institutions, development agencies, consultants, community, youth, and non-governmental organizations (NGOs).

## KEY POLICY ISSUES

In the keynote address to the NESF, President Ellen Johnson Sirleaf elucidated the following principles as the foundation of Liberia's new National Energy Policy:

- Leveraging enhanced energy access for improvements in education, health, and economic development;
- Providing access to modern energy (fuels and electricity) for previously neglected rural consumers;
- Enhancing transparency and accountability at every stage of energy operations: wholesale and retail transactions; granting of petroleum leases, electricity concessions, and other management contracts; collection of payments from consumers; the granting of licenses to providers of energy services throughout the economy; and timely adjudication of cases of official corruption, power theft, and the adulteration of petroleum products and lubricants;
- Ensuring the long-term financial viability of electric utilities and other energy companies;
- Ensuring the affordability of all energy forms for poor consumers;
- Balancing the environmental costs and benefits of all energy programs, taking into account the collective global effort to control harmful greenhouse gases responsible for climate change;
- Maximizing energy efficiency and demand-side management (DSM) to minimize the financial and environmental costs of energy development;
- Ensuring the involvement of the private sector to the "greatest degree possible" throughout the energy sector; and
- Ensuring that Liberia takes all requisite actions (political, economic, technical) on a timely basis to integrate its domestic energy policies into the ECOWAS Protocol and attendantly, the West African Power Pool, the West African Gas Pipeline, and other planned or existing international commitments, standards, and obligations.

These principles provide a "vision" for moving Liberia's economy and social sectors forward on the basis of universal access to affordable, sustainable, and environmentally friendly modern energy services. They address the following four strategic issues and objectives:

- **Access – The issue is the *availability* of energy products and services and the objective is to achieve growth with equity, ensuring that every urban and rural household, economic enterprise, and social and administrative center has access to modern energy services**. Clearly, the expansion of energy supply and delivery systems must remain the Government's most critical near-term priority, given the energy and economic deprivation of many of Liberia's citizens. It should be noted, however, that

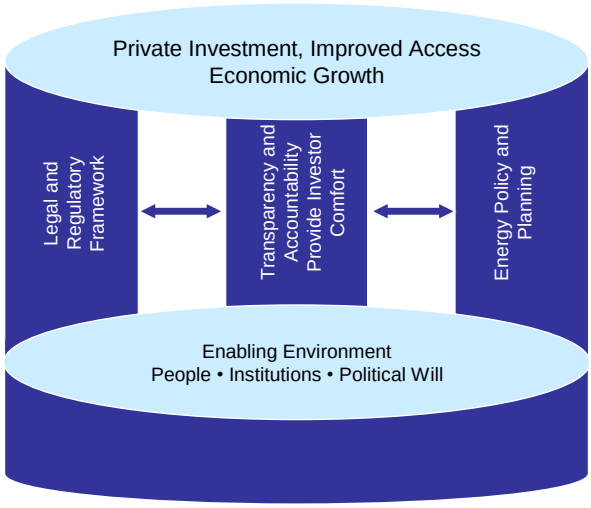
access depends on a trade-off between quality and cost – the minimum acceptable standards and the willingness and ability to pay.

- **Quality – The issue is the *acceptability* of energy products and services and the objective is to emulate international best practice in terms of product and service standards as well as management and regulatory practices**. The Government commits to recruitment procedures for key policy and subordinate positions based solely on professional merit. In all cases, the public trust must be protected and honored by all; corruption will not be tolerated in any form.

- **Cost – The issue is the *affordability* of energy products and services and the objective is to minimize economic, financial, social, and environmental costs in order to ensure a balance between the interests of investors, consumers, and the general public**. The Government is committed to providing energy services on a full cost-recovery basis to those who are able to pay and on a targeted subsidized basis to those who can only afford to pay a portion of the cost. Where subsidies are required, they shall only be used for capital and not operational or consumption expenditures.

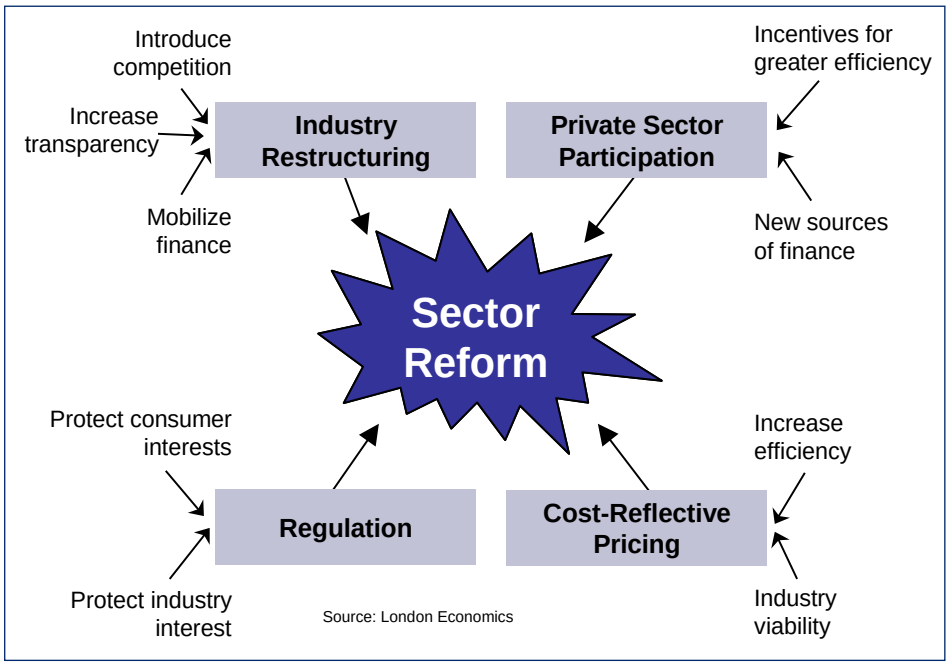
- **Institutional framework – The issue is the *adequacy* or capacity for energy delivery and the objective is to create a partnership between the public and private sectors which results in the involvement of the private sector to the greatest extent possible**. The Government pledges to establish an efficient, transparent, productive energy sector based on a strong policy, legal, and regulatory framework that ensures equitable treatment of all stakeholders. Quite simply, the Government does not have adequate budgetary resources to develop the energy infrastructure to deliver modern energy to Liberia's people. Private resources must be attracted to Liberia's energy sector, and that investment will not be realized without adoption of appropriate reforms. Private investment will free up public-sector resources for other pressing national social priorities (health, education, housing, sanitation). Of equal importance is the need to ensure that the implementation of new policies does not overburden the limited technical, human, and financial resources available to the energy sector and damage Liberia's fragile economy.

The realization of these policy objectives requires the Government to create an enabling environment built on the following **three essential features. (1) Demonstrating the Government's resolve for good governance and ensuring financial transparency in all sector transactions:** transparency improves efficiency and provides a level playing field by ensuring that the same information and access to decision makers are available to all market participants; transparency also provides assurance to potential investors that all participants in the energy sector are treated equitably. **(2) Overcoming the significant obstacles to private sector investment in energy supply:** perceptions of political risk or a lack of purchasing power discourage energy sector investors from considering Liberia as a place for undertaking projects. To remedy that, the Government needs to alter the factual bases giving rise to those perceptions and to improve the knowledge base available to potential energy sector investors so as to allow them to make informed, positive decisions in favor of undertaking Liberian projects. The development of this NEP is part of the process of communication to foster positive investor perception. **(3) Creating the requisite institutional and legal framework and independent regulatory regime:** four essential features must be built into any successful enabling program for energy sector reform. These are: (i) industry restructuring to create conditions to introduce competition, increase transparency, and mobilize investment finance; (ii) promoting private sector participation by providing incentives for greater



efficiency and tapping into new sources of finance; (iii) adopting the principle of cost-reflective pricing which increases industry viability and efficiency in production and consumption; and (iv) ensuring that the regulatory process is able to balance investor and consumer interests.

**Sector Reform**




Given the political will, competent people, and appropriate institutions, it will be possible to create and enforce the legal and regulatory environment that will attract the private sector investment needed for improved energy access to support economic growth. This is a significant departure from the past when energy services were provided as a publicly funded benefit for a privileged few. The Government recognizes that these reforms represent a major cultural shift which will generate inevitable resistance from powerful vested interests benefitting from the status quo. However, the strong stakeholder support for the new policy thrust demonstrated by the NESF and NEP validation workshops provides a unique opportunity for successful implementation of the reforms.

## PERFORMANCE INDICATORS

Key performance indicators for the desired cultural shift will be monitored and reported, in order to track adherence to the NEP. Indicators will include: (1) on-time payment of electricity bills of Government ministries and other parastatals as well as those of individual senior Government officials; (2) the financial viability of the Liberia Electricity Corporation or any other public successor company in terms of profitability, improvements in billings and collections, cash management, reductions in technical and non-technical losses, number of customers connected to the LEC grid, and adherence to LEC's published disconnection policy; (3) operational autonomy of LEC as demonstrated by independent decision making on issues such as transparent staff recruitment, selection and remuneration, and transparent procurement of goods and services; (4) reduction in loss of petroleum products by LPRC; (5) consistent quality and purity of fuels and lubricants sold to the public; (6) accuracy of meters and gauges at both wholesale and retail levels; and (7) share of oil revenues received by the national treasury.

In January 2006, ECOWAS approved a White Paper for a regional policy for increasing access to energy services for rural and peri-urban populations in line with achieving the Millennium Development Goals in the sub-region. ***In line with these goals, Liberia aims to achieve the following:***

- 40% of Liberian citizens living in rural and peri-urban areas and using traditional biomass for cooking shall have access to improved stoves and kerosene or efficient-gas cookers in order to cut indoor pollution;
- 30% of the urban and peri-urban population shall have access to reliable modern energy services enabling them to meet their basic needs (lighting, cooking, communication, and small production-related activities);
- 15% of the rural population shall have access to reliable modern energy services toward meeting the same basic needs; and
- 25% of the schools, clinics, and community centers in rural areas shall have access to modern energy services for lighting, refrigeration, information and communication, etc., and shall be equipped with productive energy capacity.

***Further, in line with the international community, and based on the principles of extending energy access to all Liberians through careful consideration of the environmental costs and benefits, and with the goal of maximizing efficiency to minimize costs and any adverse environmental impacts, the Government of Liberia states the following additional targets:***

- Reducing greenhouse gas emissions by 10% by 2015.
- Improving energy efficiency by 20% by 2015.
- Raising the share of renewable energy to 30% of electricity production and 10% of overall energy consumption by 2015.
- Increasing the level of biofuels in transport fuel to 5% by 2015.
- Implementing a long-term strategy to make Liberia a carbon neutral country in energy production and transportation by 2050.

# 2. THE ENERGY SITUATION

## OVERVIEW

Prior to the development of the current NEP, Liberia's energy policy framework was not documented in a formal government publication. However, the existing energy policy can be summarized as follows from the various laws establishing the public utilities and energy corporations:

- It is the desire of the GOL to expand public utility facilities throughout the country for the benefit of all the people (preamble to the law establishing the Public Utilities Authority, 1973);
- Public utilities must be efficiently managed and operated in order to derive maximum benefit and ensure economic viability; they sustain themselves from revenues from the sale of products and services and cannot use their revenues to meet the operational and capital expenditures of other public corporations (Public Utilities Authority Law, 1973);
- Public utilities and corporations are either de jure or de facto self-regulating monopolies that can conduct business across the energy chain from exploration, production, transportation, distribution, wholesale and retail sale of all energy products and services and can establish their own prices, quality standards, and development plans as well as issue licenses to, and operate in competition with, the private sector (acts establishing LEC, NOCAL, and LPRC);
- Government-owned energy corporations and agencies have no formal managerial relationship with the sector ministry; they are managed by boards and executive officers appointed by the President with the advice and consent of the Senate. Boards comprise people appointed from the private sector but include cabinet ministers and other senior government officials. Remuneration of Board Chairpersons and Executive Officers is subject to approval by the President (Public Utilities Authority Law, 1973);
- All infrastructure development is subject to environmental impact assessment and the Government encourages the use of renewable energy resources and promotes the conservation of non-renewable energy resources (Environmental Protection and Management Law, 2002).
- The granting, implementation, supervision and monitoring of concessions in all sectors of the economy including energy is regulated by the Public Procurement and Concessions Act (PPCA) which assigns no formal role for the sector ministry (PPCA, 2005).

The current energy situation is a result of the impact of these policies and the effect of the civil crisis from which the country is emerging. The policy recommendations that are in this document are designed to bridge the gap between the reality on the ground and the vision as expressed in the principles outlined in the previous chapter. The National Energy Stakeholders Forum identified the local realities and experiences which were then summarized in the National Energy Sector White Paper and confirmed in the validation workshops.

In Liberia, as in nearly all the Sub-Saharan African and other less developed countries, woody biomass is the primary energy source used for domestic cooking and heating. In 2004, it was estimated that over 95% of the population relied on firewood, charcoal, and palm oil for their energy needs. Modern energy services based on electricity and petroleum products are predominantly used for economic production and transportation. In the household sector, the use of modern energy services consists mainly of kerosene, electricity, and liquefied petroleum gas for lighting, cooking, and entertainment. These are used by higher income households in urban areas.

The current energy situation in Liberia is characterized by a dominance of traditional biomass consumption and low access to poor quality and relatively expensive modern energy services. This is a result of the country's underdeveloped economy whose infrastructure was extensively destroyed during the 14 years of civil crisis.

There are three Government energy parastatals established by law – the Liberia Electricity Corporation, created in 1973, the Liberia Petroleum Refining Corporation, created in 1978, and the National Oil Company of Liberia, created in 2002. All these are corporate entities, wholly owned by the Government and managed by boards appointed by the President.

It is significant to note that the war effectively privatized energy service delivery by destroying the capacity of the parastatals. The charcoal industry which now dominates the household energy sector is entirely run by private operators and community-based organizations. Most electricity is generated by private petrol or diesel generators. The private sector is expected to provide the bulk of the planned electricity generation capacity development for the medium term. In the petroleum sector, the LPRC is currently only issuing licenses and providing storage facilities to private sector importers. The retail sale of petroleum products and lubricants is dominated by the private sector.

Notwithstanding this de-facto privatization of the energy sector, the parastatals still have the legal mandates allowing them to combine the roles of policy making, monitoring, and operation. This is inconsistent with international best practice which separates these roles. In practice, the parastatals discharge their regulatory roles in collaboration with the MLME.

# SECTOR SITUATION

## Electricity Sector

Under the current legislation, the Liberia Electricity Corporation is responsible for the generation, transmission, and distribution of electricity. LEC used to supply the major cities and towns that were connected to the grid or had stand-alone diesel plants. Additional power was produced by the various mining and agricultural concessions. The 14-year conflict resulted in collateral damage, looting, and vandalism of virtually all the energy infrastructure, such as power plants, substations, transmission lines, fuel storage tanks, and depots. Following the loss of these facilities, electrical output diminished drastically. Consequently, only about 10% of urban residents and less than 2% of rural Liberians have electricity access, largely produced by small private generator sets at prohibitive costs.

**Liberia's Pre-War Electricity Sector**

| | |
|---|---|
| Installed Capacity | LEC: 191 MW<br>Private: 212 MW |
| Coverage | 3 radial lines<br>11 small isolated power systems operated by LEC |
| Customers | Nearly 30,000 |
| Rural Electrification | 13 MW<br>90 miles of MV<br>26 miles of LV |

Before the civil crisis, the total installed electricity capacity of the LEC was approximately 191 megawatts (MW), while that of concessionaires was 212 MW. Outside Monrovia there were three radial lines extending into the countryside and 11 small isolated power systems operated by LEC to supply electricity to cities and towns located along the coast and in rural areas. The installed capacity of the rural electrification program totaled 13 MW and distribution lines stretched 90 miles, with an additional 26 miles of low-voltage service lines. The small isolated rural systems were powered by plants ranging from 300 kilowatts (kW) to 1300 kW. The total installed electricity generation capacity, including the private sector, was about 412 MW. To date, Liberia has never had

**Milestones in Electricity Sector Reconstruction**

- July 26, 2006: first grid-delivered electricity in Monrovia is restored, 150 days after President Johnson Sirleaf's inauguration
- December 2006: LEC's own revenues sufficient to cover fuel for its generators and O&M costs
- December 2007: LEC customer base exceeds 690
- Summer 2008: LEC generation capacity to reach 9.6 MW, 55 km of MV/LV and customer base of 2500

electrical interties with neighboring countries.

Following the end of the war and the inauguration of a new democratically-elected Government led by President Ellen Johnson Sirleaf, there have been small but significant steps taken to re-establish public power supply and recommercialize LEC. Launched in 2006 soon after the inauguration of the President, the Emergency Power Program (EPP) was designed to re-establish public power supply as part of the Government's political stabilization and economic reconstruction program. Several international partners, including the United States Agency for International Development (USAID), Ghana, Norway, the European Union, and the World Bank provided over US $40 million in grant funding and technical assistance. LEC now has a system with 9.6 MW diesel generation, 80 km of transmission and distribution network, and will have about 1,000 street lights and over 2,500 customers in Monrovia within the first half of 2009. Although only set at levels to cover operational and maintenance costs, current electricity prices are relatively high at over US $0.50/kWh. This is however lower than the cost of self-generation which is estimated at not less than US $0.75/kWh. The GOL subsidizes the balance of LEC's costs and is expected to continue doing so during the transition to cheaper medium-term generation options now under active investigation and planning.

There is no generation capacity outside of Monrovia beyond privately-owned generators and scattered donor-funded pilot projects. A number of Government agencies, community organizations and private sector establishments in rural locations in several counties have been able to receive diesel generators and solar power systems through USAID, the United Nations Development Programme, and some NGOs.

Estimates of the current level of electricity demand range from 11 to 25 MW. While Liberia's First State of the Environment Report forecasts that the demand for electricity will rise an average of 10.3% annually by 2010, and then decrease slightly to a 3.4% growth annually until 2020, a recent demand forecast by the International Finance Corporation (IFC) projects total demand for Monrovia and its environs of 19 MW by 2010, 34 MW by 2015, and 41 MW by 2020. For a variety of reasons, it appears that these forecasts are very conservative. The actual demand for Liberia, including the various concessions, is likely to be in excess of 350 MW by 2020, for the following reasons:

- Liberia's population, estimated at around 3.5 million from the provisional results of the 2008 census, has been growing at an average annual rate of 2.1%. Over 53 percent of the population is under 18 years of age. With a large pent-up demand for consumer goods and services as evidenced by previous levels of demand and rising incomes, demand for energy used in the production of these goods will increase as the population rises.

- Since pre-conflict electricity capacity exceeded 400 MW, it seems likely that at some point the economy will begin to take off and very quickly reach previous levels of capacity. Industries which are large consumers of energy are only now looking at Liberia for opportunities to re-invest. Cement processing, rubber processing, breweries, and other factories and industrial operations have a huge demand for power.

- Prior to the civil conflict, the iron ore industry consumed about 210 MW of electricity. Although none of these former mines are currently in operation, the Government has prioritized their re-opening in the short to medium term, beginning with a recent concession agreement with ArcelorMittal for one of the former mines. The next two concessions for the Western Cluster iron ore deposits and the Old Bong Mines will be awarded soon. Furthermore, aggressive mineral exploration and resource appraisal programs for additional iron ore deposits are underway. The prospects for new hard rock mines for minerals such as gold, diamonds, uranium, and bauxite are very promising. The demand for energy for these operations in the medium and long term will be very significant, and without a strong Government energy policy, the requisite power to fuel these mining operations will not be developed.

- The agriculture sector, although mostly artisanal at present, has a high demand for energy services. Agro-based concessions, such as rubber and other mechanized activities, produce electricity for their own consumption. Demand for energy in agriculture in the short, medium, and long term will be significant.

The LEC is not able to meet its current operating costs for the limited generation provided under the EPP. The utility has a US $114 million debt and no capacity to service it. Historically, LEC has always had difficulty in revenue collection and coping with electricity theft, and has had frequent management changes. LEC has therefore never had, and still does not have, the ability to finance the investment needed to satisfy the country's electricity demand. Fortunately, there are several private sector developers who are interested in investing in Liberia and who have bankable proposals for investment in power generation. Given the urgency required for the restoration and extension of the country's electricity generation, transmission and distribution infrastructure, and the fact that the Government does not have the financial resources to undertake these investments, the only plausible option is to create the conditions necessary to support these private sector initiatives. The implementation of the recommendations in the NEP, which are designed to fulfill the vision of President Johnson Sirleaf to involve the private sector to the greatest degree possible, will play a critical role in ensuring the successful realization of these private sector investment initiatives.

President Johnson Sirleaf has committed Liberia to involve the private sector **to the greatest degree possible** in the power sector

## Petroleum Sector

Since Liberia has not yet discovered any crude oil and its only refinery is being scrapped, all refined petroleum products and lubricants are imported. Yearly volumetric imports of approximately 175,000 metric tons consist predominantly of gasoline, diesel fuel, and to a lesser extent, jet fuel and kerosene. Most of the petroleum usage in the country is for the transportation sector, which also has critical effects as a cost input to other goods and services. With the rising cost of petroleum products there is an increased awareness of the need to ensure that petroleum products are of first-rate quality and are used as efficiently as possible.

The GOL's role in the petroleum sector is conducted through the Division of Hydrocarbons in the MLME and two Government-owned parastatals – the "upstream" National Oil Company of Liberia, and the "downstream" Liberia Petroleum Refining Corporation.

Prior to the establishment of NOCAL, MLME's Division of Hydrocarbons played the lead role in negotiating agreements with the handful of international oil companies that came to Liberia with the intent of securing upstream petroleum exploration and production contracts. With its creation in 2002 under President Taylor, this institutional responsibility was passed on to NOCAL. The MLME is now involved through the Inter-Ministerial Petroleum Technical Committee (IMPTC), which it chairs.

In decades of oil exploration activity by international oil companies, no onshore commercial hydrocarbon reserves have been discovered, though offshore exploration holds some potential. In the event that oil is discovered the country has taken steps to avoid the oil curse where social and political turmoil can result when the general public does not benefit from the oil wealth. In September 2007 Liberia achieved Candidate Status of the Extractive Industries Transparency Initiative. This means that the country has satisfactorily demonstrated its commitment to ensure the transparent and effective disclosure and use of revenues generated by its natural resources.

In the downstream petroleum sector – following institutional evolutions and the closing of the refinery – LPRC became responsible for negotiating and purchasing requisite volumes of petroleum products and lubricants, offloading and storing them, and signing leases with wholesalers for onward sales throughout the country. A few private companies had their own storage facilities. Currently, LPRC exercises the authority to issue import licenses for petroleum products and lubricants based on the legal interpretation of the 1989 Petroleum Law that the company has a monopoly on this activity. Furthermore, the Company can either franchise out the products or sell these at wholesale and retail levels. A number of large and small vendors currently hold licenses and distribute petroleum products and lubricants throughout the country on often impassable roads. Owing to the difficulties of distribution, the availability of fuel in more remote rural areas is often confined to plastic bottles or gallon jars without any assurance of quality or quantity. Wholesale and retail petrol outlets often sell adulterated fuel with little or no oversight by the Bureau of Standards.

Volumetric gauges at petrol stations are often not calibrated properly, cheating consumers who have few avenues of redress.

Despite some progress over the past two years, LPRC needs to make sizeable investments in both the offloading infrastructure for petroleum products and in the fuel storage facilities in Monrovia. All these facilities suffered from a severe lack of maintenance during the years of civil conflict; in addition, some of the facilities have been severely vandalized. In August 2007, LPRC commissioned a report from William G. Matthews Associates Limited to assess the infrastructure needs for petroleum product logistics in Monrovia and analyze the costs needed for upgrade and repair of the main product storage terminal.

The firm noted that since the civil conflict ended in 2002, LPRC has performed some "basic maintenance but both facilities have technically deteriorated to a degree that they are unsafe and represent a serious risk to the country's fuel supply." An estimated US $14 million is required to repair the facilities and expand them to meet forecast demand in 2013. There is also a need to invest in a jetty-to-shore pipeline and to rehabilitate the jetty piers, which fall under the jurisdiction of the Monrovia Port. Further, according to the Consultant's report, the entire pipeline project must be carried out in an integrated manner to reduce costs.

The existing pipelines are so corroded that operating pressures have had to be reduced to prevent leakage. This has resulted in "excessive delivery times" and consequent demurrage charges as the products cannot reach shore in contracted volumes on anything resembling an efficient operation or schedule. In addition, the "pipe supports are deeply corroded while the walkway grating is largely absent due to pilfering."

The Consultants found that all 13 tanks thought to be salvageable are in need of serious repair. The cost of neglect was reinforced by the Consultants, who noted that nearly 4% of the terminal's yearly gasoline throughput is lost to evaporation. The Matthews Report found the truckloading stations to be derelict in terms of international safety standards; soil protection at pumping stations was described as inadequate to ensure environmental protection. Finally, the Matthews team noted that fire protection is practically non-existent, owing to the absence of equipment and a near total lack of procedures or training for emergency response. It concluded that were a serious fire to occur, the results could be catastrophic – shutting down Monrovia's fuel supply. With Liberia's petroleum product needs expected to rise dramatically by 2013, the GOL recognizes that priority must be given to rectifying these problems. LPRC estimates that it will take three to four years to complete the critical repairs, upgrades, and expansion of all aspects of the petroleum product and lubricant supply logistics system.

## Rural and Renewable Energy Resources

Almost 74% of Liberia's population resides in rural areas, while the remaining 26% live in and around the urban center of Monrovia. Rural households expend a significant amount of their meager incomes on inferior forms of energy such as candles, flashlights, and kerosene or oil lanterns for lighting. Higher fuel costs result from long transportation distances, fragmented delivery systems, and absence of economies of scale.

The population density of some rural areas along the main highways between the national and county capitals makes it economically feasible to connect them to the electricity grid when that is re-established and extended. The rest of the rural areas will have to rely on off-grid options for a long time – or even indefinitely. Technological advances in the exploitation of renewable resources, together with cost reductions, have enhanced the possibility of electrifying such areas using distributed generation sited close to the electric load.

> Liberia must integrate renewable energy technologies and services into the overall national energy supply mix in order to avoid the emissions, particulates, and waste associated with conventional energy sources. This is particularly important given limited technical and financial resources, a growing population, and escalating energy demand and consumption.

Liberia also needs to diversify its sources of energy. While diesel-based power generation has been essential in quickly providing emergency power to Monrovia, this means of power production is inefficient and depletes foreign exchange. Beyond the present fossil-fuelled electricity generation, Liberia has enormous renewable energy potential. Prior assessments of the renewable

energy resource potential in Liberia have demonstrated abundant hydro, biomass, and solar resources for development. Liberia has six major rivers, which drain over 60% of the country's water. These include the Mano, Saint Paul, Lofa, Saint John, Cestos, and Cavalla Rivers. Short coastal waterways drain about 3% of the country's water. This intensive drainage pattern indicates considerable potential for hydroelectric power in Liberia. At the onset of the civil war, there were three operational hydroelectric power plants in Liberia: Harbel, which was operated by Firestone Natural Rubber Co., with a capacity of 4.0 MW; Mount Coffee, operated by LEC, with a capacity of 64 MW; and Yandahun, a community-managed micro-hydro system in Lofa County, with a capacity of 30 kW. The Mount Coffee and Yandahun plants were destroyed during the war, but the Harbel plant is still operational for use by Firestone. Recent surveys of the damage at Mount Coffee indicate that rehabilitation and restoration of the plant to operational status may be possible within 7-10 years, providing vitally needed generating capacity.

The country is endowed with considerable biomass resources that, if managed sustainably, could contribute to the energy supply mix. These include rubber, oil palm, pine, and other trees as well as cassava, sugarcane, elephant grass, coconuts, and crop residues from rice and wheat production. Sustainable management of such resources must include replanting programs, to ensure that utilization of biomass for energy does not contribute to deforestation, and close coordination with the agriculture sector, to ensure that biomass for energy does not compete with biomass for food production. In addition, annual solar insolation shows good prospects for the application of solar technologies such as photovoltaic and solar thermal systems. Though no official renewable resource assessment has been carried out in Liberia, preliminary estimates suggest that the monthly average daily solar radiation on horizontal surfaces in Liberia is between 4.0 and 6.0 kWh/m$^2$/day. Finally, observations along the coastal regions suggest that there are potential prospects for the development of wind power.

**Liberia's Significant Renewable & Hydropower Potential**

- Monthly average daily solar radiation of 4.0-6.0 kWh/m$^2$/day
- Potential wind power in coastal areas
- Biomass (rubber, oil palm, pine, cassava, sugarcane, elephant grass, coconut, crop residues)
- Intensive drainage patterns indicate substantial hydropower potential – 6 major rivers drain 66% of country's water

Notwithstanding these abundant resources and off-grid generation technologies, limited financial, institutional, and human capacity constrains Liberia's ability to harness its renewable energy resources to serve the population. Setting a realistic goal for replacing a percentage of the country's existing fossil energy demand with non-fossil fuels within a specified time period will help galvanize investment in the renewable energy sector.

Many of the rural population cannot afford to pay for modern energy services without end-use subsidies; capital subsidies for project development; or outside assistance from NGOs, bilateral and multilateral donor agencies. Consequently, many homes in Liberia, which will not be able to afford the full delivered cost of electricity in the short to medium term, will require support for more efficient technologies for sustainable production and utilization of traditional energy resources.

# CROSS-CUTTING ISSUES

## Energy Policy and Planning

The National Energy Committee was established in 1984 to facilitate stakeholder coordination for policy development and strategic planning for the energy sector. The NEC became dormant in the few years leading to the civil crisis and has not been convened since then. Consequently, until this policy formulation process was launched in October 2006 with the National Energy Stakeholders Forum, this vital government function had been neglected.

The GOL is using the EPP Steering Committee to coordinate the efforts of various donors and to facilitate planning for the medium term. This is a temporary arrangement and it is necessary to establish a more formalized policy and planning process.

## Policy Monitoring and Regulation

The Government's oversight of the energy sector is exercised through the Ministry of Lands, Mines and Energy. Under current legislation, there is no independent energy regulatory board. This is a situation where the GOL and its agencies play the role of referee and player at the same time. This creates an uneven playing field that can be a significant barrier to the further growth of the private sector.

The Department of Energy in the MLME comprises one Assistant Minister supported by two senior officers, one responsible for hydrocarbons and one responsible for alternative energy. The Government therefore has limited capacity to undertake energy policy monitoring and regulatory functions. The Ministry chairs NOCAL's Inter-Ministerial Petroleum Technical Committee. The MLME has no office that is solely dedicated to the electricity sector. During the Emergency Power Programs I and II, LEC has reported regularly to the Emergency Power Program (EPP) Steering Committee through which the GOL has had access to donor-funded technical assistance. The MLME chairs the Steering Committee, but the Ministry's oversight of LEC is otherwise ad hoc.

## Energy Efficiency, Conservation, and Environment

From an environmental perspective, energy production and use can harm human health and the environment if not efficiently and sustainably undertaken. The inefficient use of traditional woody biomass by over 95% of the population poses environmental threats and health problems through deforestation and indoor air pollution. At the same time, the unsustainable use of forest resources at an alarming rate for the production of energy poses a growing and serious threat to the environment and the country's ecosystem, including the future viability of the country's hydro resources. Demand for charcoal and firewood will continue to grow in the absence of electricity and energy efficiency measures.

Nations of the world have been called into action through the UN Framework Convention on Climate Change (UNFCCC) to mitigate, abate or reverse emissions of carbon dioxide and other harmful greenhouse gases into the earth's atmosphere. Fossil fuel energy consumption and deforestation constitute two of the major sources of greenhouse gases. The Kyoto Protocol and its post-2012 successor arrangements recently launched in Bali prescribe mechanisms for reducing greenhouses gas emissions and encourage the harnessing of non-fossil fuel energy sources. Liberia subscribes to the World Summit on Sustainable Development and its Johannesburg Plan of Implementation. Liberia is also a party to several multilateral environmental agreements, recognizing that obligations under these instruments are necessary to address environmental conservation and sustainable use of resources. Liberia's Environmental Protection Agency (EPA) has been given the mandate to supervise, coordinate, and consult on all environmental activities in the country.

As a member of the shrinking global village, the long-term energy policy of Liberia must take into account the reality of global warming with the concomitant acceptance by our nation of its part in the collective responsibility to reduce emissions and protect the environment. Indeed, the nation has a large reserve of tropical forests which serve as a carbon sink for greenhouse gases. Following enactment of a global carbon regime, Liberia may receive financial payments for protecting these resources while contributing to the benefit of all humankind. In fact, the nation's valuable renewable hydro, biomass, wind, and solar resources may allow Liberia to lead the way in becoming one of the least carbon dependent nations in the world.

Energy efficiency and resource conservation can also represent the most cost-effective and immediate solutions to minimize the supply-side investments necessary to meet growth in energy demand. Energy efficiency measures involve replacing existing technologies and processes with new ones that provide equivalent or better energy service using less energy. The value of the saved energy typically at least covers the cost of deploying the new technologies and processes. Energy efficiency programs can reduce future investment requirements, enhance competitiveness by lowering input and operating costs, free up capital for other social and economic development priorities, and contribute to environmental stewardship objectives.

## Gender-Related Energy Issues

As is typical in developing countries Liberia's limited access to modern fuels and electricity contributes to gender inequality. Women and children are responsible for most household cooking, gathering firewood or making charcoal, and fetching water. This takes time away from other productive activities as well as from educational and social participation.

Access to modern fuels eases the domestic burden on women and children, reducing the strain on their health and allowing them to pursue educational, economic, and other opportunities. Modern energy services allow health clinics to refrigerate vaccines, treat patients at night, and educate via television and radio. Improvements in health raise human productivity, which in turn raises incomes. Access to electricity also leads to significant reductions in maternal mortality. Women who have no opportunity for school during the daytime can take advantage of night literacy classes, which require electricity to function.

Economic productivity can increase significantly once women and children are free from the daily burdens of fetching firewood, making charcoal, and walking long distances to fetch water. They can become gainfully employed in industries such as tailoring, which makes use of electric sewing machines, and other cottage industries such as small bakeries, canteens, and laundry services, which require very little electricity yet can transform lives. Women can also become active in the development of rural energy services around the country, as well as carrying out marketing campaigns and teaching others about new lighting, cooking, and other technologies.

It is vital to identify and mitigate the negative impacts arising from the differentiated social and economic roles of men and women in the context of energy policy. Millennium Development Goal 3 addresses "promoting gender equality and women's empowerment." The Government will need to ensure that provision of energy services is targeted at narrowing the opportunity gap between men and women. Although the GOL has a ministry dedicated to gender affairs, it has no program or capacity to address energy-related gender issues. The MLME, which should take a lead role in developing and implementing appropriate policies to address these important considerations, does not currently have the necessary resources to do so.

## Regional Cooperation

Liberia is a member of the Economic Community of West African States which is working towards greater regional cooperation in energy. ECOWAS has approved an Energy Protocol that outlines principles for cross-border energy trade and investment. The West African Power Pool and the West African Gas Pipeline present opportunities for the long-term development of Liberia's large hydropower potential. The GOL is committed to membership in these organizations and participation in these projects.

The ECOWAS Energy Protocol was approved by the Heads of State of the Member States of ECOWAS in January 2004. Since then, it has undergone various ratification processes in those Member States. Although this is a key document for defining the investment climate in Liberia's energy sector the country has not yet acceded to the Protocol. This important Protocol provides a ready-made framework for long-term energy sector cooperation among Member States, unimpeded energy transit, and increased cross-border energy trade. Since Liberia's energy potential, particularly hydropower, once it is fully developed, is likely to remain surplus relative to the country's domestic energy needs for many years to come, participation in these cross-border projects will generate valuable foreign exchange on a sustained basis.

The West African Power Pool was created by Decision of the ECOWAS Heads of State in December 1999 to address the issue of power supply deficiency within West Africa. Following that Directive, WAPP was guided by a Steering Committee comprised of Energy Ministers of the ECOWAS Member States, and supported by a Project Implementation Committee, comprising Managing Directors of Members States' utilities, and Technical and Institutional Working Groups. In January 2006, the new WAPP Organization was established, with Member States, including Liberia, executing an Articles of Agreement the following July.

Presently, Liberia's designation as a Zone B Area gives it a lower priority for interties. It is the desire of the Government of Liberia to elevate that priority such that intertie opportunities become available soon. To that

end, it is the policy of the GOL to promote active participation in WAPP, including seeking interties with the power systems of neighboring countries. Through the MLME and LEC, Liberia is already an active participant in WAPP activities. The country is participating in cross-border rural electrification projects that will benefit 18 communities in the counties along the border with Cote d'Ivoire. A major transmission interconnector is planned that will assist Liberia in re-establishing a national grid that will be linked to Cote d'Ivoire, Guinea, and Sierra Leone.

In the gas sector, construction is nearly complete of the West African Gas Pipeline, bringing Nigerian gas to Benin, Togo, and Ghana. The Nigerian gas is being flared or vented currently and represents a relatively low cost and plentiful source of energy which will be used by the recipient countries for power generation.

# 3. ELECTRICITY SECTOR REFORM

## SECTOR REFORM PRINCIPLES AND OBJECTIVES

Although the Government's desire for universal energy access was expressed decades ago, the reality is that even before the civil crisis access was limited to a privileged few in the main cities and towns. The significant private sector investment in power generation was for individual consumption. LEC had the legal mandate to "engage in the development, generation and transmission of electrical energy, the manufacture, construction and installation of electrical equipment and devices related thereto, and the distribution and sale of said electrical energy and related electrical equipment and devices, to cities, towns and the public in general for heating, lighting, and power purposes."

Ownership of LEC was restricted to the Government, which did not have the ability to provide enough capital to enable the utility to discharge its mandate fully and to extend services to the majority of the population as dictated by the policy. Notwithstanding its legal authority to determine its own rates, fees, and charges, LEC never had the revenue to generate the capital from its own resources. Only 6% of its pre-war generating capacity was dedicated to rural electrification, which in practice was limited to county capitals.

In order to prevent abuse of its considerable self-regulating powers, the law places restrictions on the operational autonomy of LEC. The restricted operational autonomy has had counter-productive results because over the years this has compromised LEC's ability to achieve the expected economic viability and management efficiency.

The current shortcomings in the performance of the electricity sector are a result of the following existing policy inconsistencies:

1. The electricity business is highly capital intensive and yet the law restricts the LEC to 100% ownership by the Government, which has never been able to provide sufficient capital to enable the utility to discharge its mandate;

2. Notwithstanding the Government's explicitly stated desire to provide access to the whole country, the law is silent on the special needs for rural energy investments and hence, minimal attention has been devoted to rural areas in practice. Rural areas are remote and sparsely populated and have relatively lower income levels compared to urban areas and this makes it financially unviable for investors to provide modern energy services in these areas.

3. Although in theory LEC has autonomy to set its own rates, fees, and charges, in practice this is negated by its restricted operational autonomy which in turn restricts the ability of the organization to achieve the management efficiency required for the desired economic viability.

The vision of the universal access to reliable and secure electricity services will be achieved by adopting the following improved policy framework that builds upon the positive aspects of the existing policies and removes the identified weaknesses:

## STATEMENTS OF POLICY

1. ***It is the policy of the Government to accelerate the pace of electrification by facilitating increased private sector investment in the electricity supply industry through the unbundling of the manufacture, generation, transmission, distribution, and retail sale of electricity and encouraging the sale of excess generating capacity from private facilities to neighboring communities.***

2. ***It is the policy of the Government to encourage and support the development and sale of excess electricity generating capacity by private investors, for the benefit of neighboring communities, as part of their corporate social responsibility.***

3. ***It is the policy of the Government to promote regional cooperation in electricity through a wholly or partly publicly owned and efficiently managed national grid company that shall actively participate in the West African Power Pool and other regional and international activities designed to enhance international trade in electricity.***

4. ***It is the policy of the Government to establish a transparent and independent electricity regulatory process that will ensure the safe, secure, reliable, and environmentally-friendly production and use of electricity at cost-reflective but affordable prices.***

5. ***It is the policy of the Government to promote the least-cost development and utilization of the electricity facilities, taking account of the economic, financial, social, and environmental factors and the special need to ensure access by the poor through use of targeted and transparent capital subsidies.***

# GRID POWER

## Access

The unbundling of the electricity industry will result in transparent costing and pricing of generation, transmission, distribution, and retail sale of electricity, allowing the entry of private sector and community developers into segments of the industry where they are competitive in terms of expertise and resources.

The Government, with technical assistance from LEC, shall develop a grid development master plan to facilitate the orderly development of the power system by the public, private sector, and local communities. The grid master plan shall complement the rural energy master plan based on off-grid and renewable energy technology investments. The Government shall make maximum use of opportunities for cross-border connections at the distribution level to accelerate the electrification of communities along the country's borders.

The Government shall allow access to the grid by licensed generators and distributors on terms and conditions designed to incentivize private investment capital.

## Quality

The national grid shall be designed and operated to allow safe, secure, and reliable operation when interconnected with neighboring countries.

## Cost

The Government shall ensure the long-term financial viability of efficiently managed electric utilities by allowing full-cost recovery from those who are able to pay and providing explicit subsidies targeted at those with limited ability to pay. The Government shall undertake long run marginal cost (LRMC) studies as a tool for the least-cost development of the power system. The LRMC is theoretically the cost of providing for an indefinite increase in demand but in practice is estimated using the incremental cost of expanding capacity to meet demand over a defined long-term planning horizon. Operators shall be free to set their own prices, subject to costs allowed by the regulatory board. Where feasible the regulator shall encourage free and fair competition to enable consumers to get the best prices.

## Institutions

The Government policy-setting functions for grid-based electricity shall be exercised through a Grid Power Unit within the MLME's Department of Energy. The Government shall issue investment and operating licenses for independent power producers, independent power transmission and distributors whose

operations shall be monitored by the Energy Regulatory Board. The ERB shall be resourced adequately to perform its mandate of monitoring of costs, review of plans, and quality standards and promotion of fair competition, including dispute resolution among stakeholders.

To facilitate the involvement of the private sector in generation, distribution and retail functions – the competitive aspects of LEC's business – the Government shall consider and implement several privatization options, which shall include but not be restricted to, management contracting, BOT (Build, Operate, and Transfer), BOO (Build, Own, and Operate), and BOOT (Build, Own, Operate, and Transfer).

Because of the monopoly nature of the national grid and the inter-governmental relationships involved in regional cooperation activities it shall be necessary, for the foreseeable future, for the Government to maintain significant ownership of a restructured, operationally efficient, and financially viable LEC as the national grid company. In this capacity the LEC will be the country's utility representative in WAPP and other regional and international forums for cooperation in electricity. With this strategy the country will position itself to develop its large hydropower potential.

To facilitate the development of large-scale hydropower for local and export demand, the Government shall, at an appropriate time, establish a Saint Paul River Authority or Liberia River Authority (LRA) which will be a public/private partnership modeled loosely on the federally directed Tennessee Valley Authority (see box) in the United States or Ghana's Volta River Authority. The SPRA or LRA will focus on river basin management and facilitating hydropower development and will not diversify into thermal power generation as TVA did. The Authority will effect a wholesale economic transformation of the country by developing large-scale hydropower potential of the nation's river basins, estimated at over 1000 MW by several studies conducted before the civil crisis. This should fuel Liberia's economy, as well as provide power for export and thereby generate valuable foreign exchange, and develop ancillary irrigation systems that will generate employment in agriculture and other high value agro-processing industries. In addition, the development of reservoirs will allow for development of a tourist industry and job creation for fishing, boating, wildlife management, and related economic activities. The Authority will have oversight authority, excluding licensing, for all development activities affecting both upstream and downstream portions of the Saint Paul and other river basins, including the revitalization of the Mount Coffee hydropower plant in a manner consistent with optimal development of Liberia's water and hydroelectric resources.

**TENNESSEE VALLEY AUTHORITY**

The TVA was a vast US Government project commenced in the 1930s, designed to harness the hydroelectric power of the southeastern region of the United States to make power affordable for everyone and to stem floods, while providing electricity that would attract industry into a historically economically deprived area, and providing well-paying jobs. Legislation establishing the TVA was amended in 1959 to allow it to be self-financed and supported, and thus competitive with private power producers in the region.

## OFF-GRID POWER AND RENEWABLE ENERGY

### Access

To avoid the historical neglect of remote and low income rural communities the Government shall establish special incentives and financing mechanisms to facilitate the availability of affordable electricity supplies. The development and growth of private and community-owned rural energy service companies shall be supported.

The Government recognizes the need to provide efficient non-electric energy resources for those communities that will, for the foreseeable future, not have access to the grid or off-grid electricity due to affordability and resource constraints. Examples of non-electric energy resources that could be considered include high-efficiency charcoal or biomass stoves for cooking. Low cost but efficient solar lanterns will be

promoted for lighting. To generate employment and help to raise incomes for such communities, the Government will prioritize the use of modern energy services for productive activities. With increased incomes, demand for modern energy services for enhanced quality of life will increase naturally.

### Quality

To protect customers the Government shall establish and enforce technical standards for renewable energy technologies used for off-grid electrification. The Government shall also establish a licensing system for installation contractors.

### Cost

The Government shall adhere to the policy of cost-reflective but affordable pricing. Operators shall be free to establish their own prices subject to costs allowed by the ERB and pricing principles designed to facilitate access by the poor. Appropriate financing mechanisms will need to be established to support all economically and socially acceptable rural energy projects regardless of financial viability. Targeted subsidies in the form of grants, low interest loans or guarantees shall be utilized to allow access by the poor.

### Institutions

The Government shall establish an Off-Grid Power and Renewable Energy Unit in the MLME (within the Division of Electricity and Renewable Energy) and a Rural and Renewable Energy Agency and its associated Rural Energy Fund as institutions dedicated to provide the special support required for remote and low income communities. The RREA, which shall be responsible for managing the REFUND, shall provide technical and financial support, but the actual delivery of services will be undertaken by the public and private sectors, and community developers, with the regulatory oversight of the ERB. Section 5 provides more details on the institutional framework for rural and renewable energy.

# 4. PETROLEUM SECTOR REFORM

## SECTOR REFORM PRINCIPLES AND OBJECTIVES

The Government's institutional framework for the petroleum sector comprises an office responsible for hydrocarbons in the MLME and two state-owned enterprises dedicated to upstream operations (NOCAL) and downstream operations (LPRC). In many countries which have human and material resource constraints similar to those facing Liberia the upstream and downstream operations are undertaken within one company. This has the advantage of reducing institutional costs and overheads.

In the upstream sub-sector petroleum exploration and development is one of the highest priorities for the nation. Although the history in Liberia shows that there was minimal attention given to upstream operations until a dedicated institution for that sub-sector was created, one of the major lessons that have been learned from experience is that the Government needs to be more involved in the upstream sector to ensure that the public interest is protected. On the other hand, in the downstream operations the focus is to unbundle in order to facilitate the maximum private sector investment that is urgently required. The remaining functions can then be more efficiently undertaken by a single corporation that has responsibility over both upstream and downstream operations. Subject to the necessary legislative process, the GOL will create such a corporation to be the successor to NOCAL and LPRC.

Because the law does not provide for separation of policy-setting, monitoring, and operational roles, both the MLME and NOCAL are involved in policy setting in the upstream sector. The MLME chairs the Inter-Ministerial Petroleum Technical Committee (IMPTC) that analyzes the technical issues related to applications for licenses and concessions. The IMPTC is the technical arm of the Inter-Ministerial Concessions Committee (IMCC) which makes the final recommendations, in accordance with applicable laws, regulations, and procedures, to grant the licenses and concessions. NOCAL receives applications from interested investors, submits them to the IMPTC, to which it provides technical advice, and then supervises the implementation of the resultant concession agreements. Except for NOCAL's conflict of interest explained in more detail below, and the need to have a more formally defined role for the sector ministry, this licensing process, which is in accordance with the Public Procurement and Concessions Act (PPCA), works very well and the Government shall also adopt it for the licensing of the electricity sector and downstream operations.

With the creation of an independent regulatory body, the Energy Regulatory Board, it will be necessary to amend the Petroleum Law to vest explicitly the policy setting functions in the MLME, policy monitoring role in the ERB, and the commercial operational functions in NOCAL or its successor. The main problems with the Act which established NOCAL and the New Petroleum Law under which it is operating are inconsistencies and, in some instances, violation of international best practices:

1. Those Acts empower NOCAL to grant petroleum rights to itself as well as to other companies. In essence, companies may compete with NOCAL in the allocation of petroleum blocks. This makes NOCAL a "player and referee at the same time."

2. Blanket powers were given to NOCAL to "...undertake planning for the orderly, rational and optimized development of the petroleum and energy requirements of the Republic of Liberia." This conflicts with one of the functions of the Minister of Lands, Mines and Energy.

3. The Act empowers NOCAL to participate in downstream petroleum activities. With the existence of the LPRC, two public corporations are in charge of the same sub-sector.

4. There are also concerns about budget, especially if oil is found. As a public corporation, NOCAL will legally have the right to expend millions or billions of oil revenue, as long as it has the approval of the Board of Directors.

5. The Petroleum Law is also inconsistent in its discussion of the signatories required to make petroleum contracts binding on the state. The Law mentions nothing of Legislative Ratification of Petroleum Agreements.

There are other issues in the Petroleum Law which have to be addressed to make Liberia competitive for private sector investment in the upstream sector, such as the Government's free equity, mandatory bidding requirements for blocks, and other petroleum contracts.

To underscore the country's desire to achieve international best practice in terms of transparency and good governance, Liberia has joined the Extractive Industries Transparency Initiative, which is a verifiable commitment to ensure the transparent and effective disclosure and use of revenues generated by its natural resources.

In the downstream sub-sector there have been significant improvements since 2006. The main problems concern the quality of the petroleum products and lubricants, dilapidated storage and pipeline facilities, and legal provisions that create conflicts of interest by giving LPRC functions that overlap policy setting, monitoring, and implementation. Therefore, the main issues for the downstream sector are the unbundling of LPRC operations to facilitate privatization and the review of the enabling legislation to remove current inconsistencies. The following specific actions are to be undertaken:

1. Amendment of LPRC's corporate charter to limit its monopoly role in overseeing: (i) the physical importation of petroleum products and lubricants; (ii) the requisite offloading and handling facilities at the port (including all pipelines); (iii) the ownership of storage tanks and other ancillary facilities; (iv) the further offloading onto trucks for wholesale distribution; and (v) responsibility for meeting all safety and environmental laws, rules, regulations on any of the above activities.

2. Transfer of the legal authority to manage and operate the jetty-to-shore pipeline and the rehabilitation and operation of the jetty piers from the Monrovia Port Authority to the LPRC or another licensee after international competitive bidding.

3. Transfer to ERB of all regulatory oversight of petroleum product and lubricant quality, regulation of all tank cars moving such products to enforce compliance with safety and environmental laws, rules, and regulations, as well as monitoring of retail outlets to ensure quality standards, proper calibration of pumps, etc.

4. Rescission of LPRC's right to issue import licenses and transfer of this authority to the Inter-Ministerial Committee chaired by the MLME, which will be responsible for establishing transparent licensing criteria, with LPRC serving as technical advisor as required.

5. Scrapping of LPRC's old refinery, which has been out of commission even before the commencement of the civil conflict and was severely looted during the years of unrest, and allowing private investors to explore investment opportunities for construction of a new refinery focused on the export market because the domestic demand at present is relatively small.

## STATEMENTS OF POLICY

1. ***Given the Government's limited human, financial, and material resources and infrastructure, upstream and downstream petroleum operations (exploration, production, refining, wholesale and retail operations) shall be undertaken by a single state-owned corporation operating in partnership with domestic and international private enterprise.***

2. ***It is the policy of the Government to ensure transparent and independent regulatory oversight by vesting policy setting functions in the MLME, policy monitoring functions in the Energy Regulatory Board, and limiting the role of public and private companies to policy implementation.***

3. ***It is the policy of the Government of Liberia that environmental protection is exercised to the maximum extent possible throughout all aspects of petroleum exploration and development. Petroleum exploration and development should be conducted within sound principles of resource conservation together with due regard for the health and safety of workers, marine and other waterborne wildlife, and surrounding communities. Where laws need modification to ensure such environmental protection, it is the policy of the Government that this be made a critical priority of both the legislative and executive agencies.***

4. ***It is the policy of the Government that throughout the entire process of petroleum exploration and extraction there should be transparency of procedure and accountability to the Liberian people.***

# UPSTREAM OPERATIONS

## Access

For the purpose of oil exploration, the country has been divided into 17 blocks which extend from the continental shelf into deep water. These are allocated to petroleum exploration companies on the basis of international competitive bidding. As incentives, the winning bidders are offered internationally competitive terms in Production-Sharing Agreements (PSAs) where they get the bulk of the revenues in the initial years in order to recoup their development costs.

## Quality

Tendering for exploration blocks shall be based on transparent international competitive bidding.

## Cost

All operations shall be monitored by the ERB to minimize adverse impacts on health, safety and environment.

## Institutions

Under the proposed reforms, the MLME, acting through the Hydrocarbons Division (Upstream Operations Unit), shall be the Procuring or Concession Entity for the purposes of the PPCA. The MLME shall assume responsibility for policy formulation, setting the terms and conditions of companies desiring licenses for exploratory drilling, exploration, and commercial development. Based on these criteria, internationally competitive tenders for access to various areas of the country, including both onshore and offshore activities, shall be issued and bids processed in accordance with the regulations. Any fees, royalty payments or drilling bonuses from the resultant agreements that include concessions, leases, and production-sharing agreements relating to petroleum exploration and development, are public funds that shall be collected according to prevailing revenue legislation. A percentage of the funds collected, to be specified in regulations, shall be allocated as a contribution towards rural energy development.

The assumption of the above functions by the MLME will require the amendment of the existing legislation establishing NOCAL and LPRC which are currently vested with these policy setting functions. The GOL shall create a new state-owned enterprise, the Liberia National Oil Corporation that shall take over the technical and commercial operational functions of NOCAL and LPRC that do not relate to the GOL's policy setting and monitoring roles. NOCAL's residual functions shall be undertaken by LNOC's department of upstream operations, and those of LPRC shall be undertaken by LNOC's department of downstream operations. LNOC shall provide technical advice to the Government in determining licensing criteria and during the processing of applications for licenses and concessions. LNOC shall continue NOCAL's present function of reviewing technical proposals from the international oil and gas industry and providing them with the best geophysical and other data available to the Government. If commercial discoveries are made, LNOC staff, working as production-sharing contractors, will represent the Government's financial interest. Revenue

accruing from Liberia's share of PSAs or other payments will be sent to the Ministry of Finance (MoF). LNOC shall also be called upon to advise MoF, MLME, and ERB on the implementation by licensees of the terms and conditions of their concessions, PSAs, or other contract terms. If deficiencies are found, these shall be referred to the ERB for resolution.

LNOC's operating budget shall be funded from revenues derived from the licenses and other fees with any deficit being made up from funds allocated from the national budget. LNOC's board, which will no longer comprise Cabinet Ministers but technically and managerially qualified people from the private sector, shall be responsible for preparing the budget and submitting through the MLME for GOL approval in accordance with standing regulations. The board shall provide operating reports and audited accounts to the GOL through the Ministry'sDivision of Hydrocarbons.

# DOWNSTREAM OPERATIONS

## Access

In order to expand access to both urban and rural areas, various options are to be considered, such as partial or full privatization of the LPRC, or unbundling the operations of the LPRC into various functional companies and privatizing some of these businesses. The RREA shall actively promote and support commercial delivery of quality petroleum products and lubricants through rural energy service companies.

## Quality

Based on standards established by the Government, the ERB shall establish a monitoring system to ensure accuracy of gauges, quality of products, and compliance with safety and environmental regulations.

## Cost

The Government shall ensure that the pricing of petroleum products is determined using a transparent formula and the costs to be recovered shall be subject to regulatory oversight by the ERB.

## Institutions

The Government shall exercise policy setting functions for this sub-sector through the Downstream Operations Unit in the Division of Hydrocarbons of the MLME. LPRC's functions that are not privatized or transferred to the MLME shall be undertaken by LNOC. The LNOC's downstream operations department shall be the technical advisor to the Government, performing the same role in the licensing and regulatory process as that described for the upstream sub-sector. Similarly, any public funds from downstream operations shall be collected in accordance with prevailing revenue legislation.

# 5. RURAL AND RENEWABLE ENERGY DEVELOPMENT

## SECTOR REFORM PRINCIPLES AND OBJECTIVES

The major constraints to the delivery of rural energy services are ***affordability*** and ***remoteness***. Rural areas are characterized by relatively low income levels due to underdeveloped economic potential. Many rural communities are difficult to access owing to poor transport and communication infrastructure. Consequently, commercial energy service providers, who operate on the basis of financial viability, tend to avoid serving remote and low income rural areas.

Without dedicated institutions that are resourced to deal with the special challenges of energy provision for the rural poor, the rural communities will continue to be neglected. Accordingly, the Government will establish, by law, a Rural and Renewable Energy Agency and Rural Energy Fund to support all economically viable, socially acceptable, and environmentally friendly rural energy projects and programs regardless of financial viability. The focus on renewable energy is due to the fact that off-grid and renewable energy technologies offer the best solution for remote communities and will complement the targeted subsidies that will address the issue of affordability.

While electricity will be the major focus of the rural energy activities of the RREA, care will be taken to ensure that balanced attention is given to non-electrical options – hence the creation of an "Energy" rather than an "Electrification" agency. This is in recognition of the reality that many rural people are too remote and too poor for regular electricity supply to be a feasible energy option for them in the short to medium term. These people can still attain a higher quality of life through affordable solar lanterns and LED lighting and more efficient and less labor-intensive non-electrical energy technologies, such as efficient charcoal and wood stoves.

One of the most important tools for the RREA and REFUND will be a Rural Energy Master Plan, which will provide a prioritized development program to achieve universal energy access. Together with a Grid Development Master Plan, the country's long-run marginal cost can then be derived to serve as a strategic planning guide.

The day-to-day operations of the RREA shall be managed by a board appointed by the Minister with the consent and advice of the President. The MLME shall provide policy guidance through the Office of Off-grid Power and Renewable Energy. The ERB shall provide regulatory oversight which will take account of the need for simplified licensing and monitoring procedures for small installations (less than 500 kW or some threshold determined from operational experience).

The ultimate goal of the RREA and the REFUND is to ensure that every **household**, **commercial enterprise,** and **social and administrative center** in every **village and town** of every **district** of every **county** has access to **affordable, sustainable** and **environmentally friendly** modern energy services.

## STATEMENTS OF POLICY

1. ***It is the policy of the Government to facilitate and accelerate the economic transformation of rural Liberia by establishing a semi-autonomous agency dedicated to the commercial development and supply of modern energy services to rural areas with an emphasis on locally available renewable resources.***

2. ***It is the policy of the Government to support the development of all economically viable, socially acceptable, and environmentally friendly rural energy projects regardless of financial viability. Social acceptability shall include the need to provide preference to projects by Liberian nationals and those that take account of diversity and national interest.***

3. ***It is the policy of the Government to ensure that the utilization of biomass and other renewable resources for energy does not contribute to deforestation or to food insecurity and will adopt appropriate environmental and agricultural support strategies such as tree-replanting programs and limiting biofuel production to non-edible plants or food crops that are surplus to requirements.***

4. ***It shall be the policy of the Government to prioritize projects on the basis of economic, demographic, and geographical criteria designed to ensure enhanced access with equity.***

## RURAL AND RENEWABLE ENERGY AGENCY

### Purpose

The Rural and Renewable Energy Agency shall facilitate and accelerate the economic transformation of rural Liberia by promoting the commercial development and supply of modern energy services to rural areas with an emphasis on locally available renewable resources. The agency shall have an operational role under the oversight of the ERB and the policy direction of the MLME. The RREA's principal functions will be the planning and financing of projects to be implemented by public, private, and community developers. Secondary functions will include educating the general public about renewable energy as well as rural energy options and opportunities. In regard to the latter, the RREA will facilitate capacity building among potential rural energy service companies, including training in financial controls and general business management.

### Planning

The RREA shall prepare rural energy master plans which will integrate energy into rural development planning and other cross-cutting issues such as gender considerations, biomass use for food versus fuel, energy efficiency, and environmental protection, including deforestation safeguards; promote research and development of renewable energy technologies; recommend policies and standards for renewable energy equipment and service provision; and establish a central repository or one-stop center for all information on rural energy activities in the country.

### Financing

The RREA shall facilitate the funding of rural energy projects, including managing a Rural Energy Fund that will provide low interest loans, loan guarantees, and grants as targeted subsidies to ensure access by the poor. The operations of the RREA shall be supported by the REFUND.

### Projects

The RREA shall provide technical assistance to support the development, operation, and maintenance of rural energy products and services delivered through rural energy service companies and community initiatives.

## RURAL ENERGY FUND

### Purpose

The REFUND is to be established by law to provide for the coordinated and sustainable financing of projects and programs for the delivery of modern energy services for rural development. Once the REFUND has been established it shall become the channel through which all domestic and international financial resources intended for rural energy delivery in Liberia shall be managed. REFUND's main distinction from

other funds is the focus on economic viability, including environmental and social benefits, regardless of financial viability. Prioritization of projects on the basis of economic viability will ensure that the income-generation programs supported by initial investments will be able to contribute financially to subsequent projects. It is also important, however, to consider demographic and geographic criteria in order to ensure growth with equity. Where projects are of the same order of economic viability, preference shall be given to those serving more people. Where the projects serve approximately the same number of people, preference shall be given to those serving more than one village, district, or county.

## Sources and Uses of Funds

The REFUND will mobilize funding for rural and renewable energy services through the following mechanisms:

1. **Domestic** – Energy taxes, levies, and fees; general taxes; user fees and capital contributions; voluntary corporate social responsibility contributions.
2. **International** – Traditional bilateral and multilateral loans and grants; carbon finance.

The three main uses of the REFUND will be:

1. **Capacity building** – This will be based on grant funding and includes support for the operating budget of the RREA, marketing and promotion of renewable energy technologies, and technical assistance (research and development, feasibility studies, business planning, training and development, etc.).
2. **Project and consumer finance** – This includes provision of grants to match community contributions for approved rural and renewable energy projects and programs; provision of subsidized loans for projects that cannot be funded through commercial financial services; provision of consumer loans through micro-credit financial institutions.
3. **Risk management** – This includes provision of partial or full guarantees for approved rural and renewable energy projects and programs that can be funded through commercial financial services but where the project promoters do not have the collateral needed.

## Fund Management

The RREA will provide the day-to-day management for the REFUND. The RREA board will follow the standard procedures employed by commercial financial service providers in the processing of applications for funding. The management and staff of the RREA will include people trained to analyze projects and vet the creditworthiness and integrity of applicants.

A Fund Management Committee will be established that will include non-board members selected for their expertise, interest, and commitment, for example representatives of donor organizations, senior executives, and experts in financial services and technical experts in renewable energy technologies.

# 6. INSTITUTIONAL AND REGULATORY FRAMEWORK

## INSTITUTIONAL AND REGULATORY REFORM PRINCIPLES AND OBJECTIVES

### Energy Stakeholder Roles

The fundamental principle in establishing transparency, independence, and objectivity in decision making is separation of the roles of policy making, policy implementation, and policy monitoring. This is a principle which has been validated by many years of practice in national governance where there is a separation of the branches of government between the Legislature (law making), the Executive (law implementation), and the Judiciary (law interpretation).

Policy making is concerned with the establishment and review of guiding principles. Energy policy making includes the development of energy master plans, pricing principles and quality standards, and the granting of investment and operating licenses and concessions. Policy monitoring is the process of ensuring compliance with the guiding principles, plans, and standards.

The process of making policies shall involve coordination of input from different stakeholders. Therefore the MLME shall, through its Policy and Planning Division, reconvene the National Energy Committee. Chaired by the MLME, the NEC shall comprise relevant ministries and government agencies, NGOs, and development agencies. The NESF recommended the following – Ministries of Planning and Economic Affairs, Agriculture, Internal Affairs, Finance, Education, Health and Social Welfare, Labor, Commerce and Industry, Transport, and Gender and Development; LEC; NOCAL; LPRC; EPA; Forestry Development Authority; National Fire Service; Conservation International; Center for Sustainable Energy Technology; and international development agencies. Representatives of development agencies would not be involved in policy making but would be invited for their expertise and to share their countries' experiences.

Once policies, rules, and plans have been established, the actual implementation will be executed or supervised by the relevant sector agency and monitored by the ERB. While the ERB shall not make policies, plans, or standards, the board shall have the responsibility of interpreting and enforcing them – a process analogous to the functions of a judge in a court of law. The ERB shall, however, develop and recommend the procedures, guidelines, and regulations to be followed in implementing policy. The ERB shall also provide policy recommendations based on the experience gained in interpreting and enforcing policies and laws. The ERB shall therefore work closely with the MLME's unit responsible for policy and planning. Annex 5 provides a diagrammatic representation of a typical operating framework for the ERB.

### Ensuring Transparency and Good Governance Practices in the Energy Sector

Achieving transparency and good governance is probably the greatest challenge for the Government in the effort to enhance energy access through private sector investment. What is critical is the enforcement of rules and regulations designed to achieve transparency and good governance. **Actions speak louder than words. Investors will make decisions on the basis of Government actions rather than on the basis of policies and rules written on paper.** Examples of actions that Government will undertake to provide investor confidence include the following:

1. To ensure transparency and good governance of the ERB and public utilities**, the appointment and reporting relationships of the boards and principal officers shall avoid conflict of interest by respecting the separation of stakeholder roles.** Accordingly, the boards of the ERB and public

utilities, which are policy monitoring and policy implementation bodies respectively, shall not comprise government ministers and other officials responsible for policy setting. The Government shall appoint independent people from the private sector with the relevant technical and managerial skills required. The boards shall be appointed by the President on the advice and recommendations of the Senate based on a shortlist submitted by the Minister responsible for energy.

2. Budgets for all sector agencies owned by the Government shall be submitted to the MoF through the MLME for approval. Once approved, the **boards shall have the operational autonomy to utilize approved budgets, subject to periodic operational, financial, audit, and other reports** which the regulatory body and the Minister may require for their policy monitoring and policy setting duties.

3. **All evidence of corruption, abuse of office, and mismanagement of public resources shall result in immediate and non-discriminatory corrective action.** Some of the more common abuses that are relevant to the energy sector include failure to adhere to procurement procedures, failure by Government and senior public officials to pay for energy services on time or at all, discrimination in application of disconnection policy, failure to enforce laws relating to the theft of service (electricity) or adulteration of products (petroleum), and failure to dismiss inefficient or corrupt public officials.

### Improving the Financial Environment for Energy Sector Investments

This is an issue of communication because **Liberia has a uniquely advantageous financial environment for energy sector investment due to the fact that the country's long run marginal costs are lower than current prices – an unintended but advantageous consequence of the civil crisis.** The usual situation is the other way around because developments are generally made on a least-cost basis, with the more expensive options being developed after the lower cost options have been exhausted. In many countries, the situation is made worse where the Government has been subsidizing energy prices. This means that the cost of new investments inevitably results in significant increases in prices and hence, there is usually a lot of political resistance to private sector investments as they are associated with increased prices.

In Liberia, the civil crisis destroyed the low-cost energy options and people are now very much aware of the much higher cost of having to provide the energy through other means. Liberians with access to modern energy services are paying prices that are much higher than would be the case after significant investment into larger capacity generating units. **This means that private sector investments will lower prices and enhance affordability thereby generating popular support or minimizing political resistance normally associated with the introduction of private sector investment and its requirement for cost-reflective prices.**

The policy validation workshops also confirmed that there is a strong **willingness and ability to pay for energy even among the very poor.** This is because they are already paying high costs for inferior alternatives. People just need incentives to prioritize energy in their budgets. Again, emphasizing the key role of transparency and good governance, workshop delegates emphasized that people would happily mobilize their own financial resources if they had confidence in the integrity of the people and institutions handling the money.

## STATEMENTS OF POLICY

1. ***It is the policy of the Government to provide an enabling legal and regulatory framework that will guarantee that an efficient operator can profitably provide affordable and environmentally-friendly energy services and products of the highest quality to the whole population.***

2. ***It is the policy of the Government to establish a transparent and independent regulatory process by separating the roles of policy setting, policy implementation, and policy monitoring.***

3. ***It is the policy of the Government to vest the policy setting function in a department of energy that is resourced adequately to deal with all the sector and cross-cutting issues. Policy setting shall include the development of plans and licensing criteria as well as the issuing of licenses that are consistent with the plans and license criteria. For transparency, the plans and licensing criteria shall be made public as part of the regulatory body's functions and the regulatory body shall adjudicate, with appeals to the courts if necessary, on any grievances arising from the licensing process.***

4. ***In the granting of licenses, it is the policy of the Government to give preference to projects that provide maximum involvement and benefit to Liberian nationals and that take account of diversity and national interest.***

5. ***It is the policy of the Government to vest the policy monitoring functions, involving examining and enforcing compliance with licenses, leases, concessions, plans, and standards, in an independent energy regulatory board established by law and whose principal objective will be to balance the interests of investors, consumers, and other stakeholders.***

6. ***It is the policy of the Government to involve policy monitoring and implementation stakeholders in the policy making process and, towards this end, the Government shall establish a forum for multi-sector coordination through reconstituting the NEC.***

## RESTRUCTURING OF THE MINISTRY OF LANDS, MINES AND ENERGY

The current structure of the MLME is given in Annex 1. There are three Deputy Ministers responsible for administration, operations, and planning, respectively. Reporting to the Deputy Minister for Operations are four Assistant Ministers responsible for energy, lands, mines, and mineral exploration. This structure overburdens the Deputy Minister for Operations. The proposed structure in Annex 2 corrects this by elevating each of the core functions of the Ministry – lands, mines and energy – to the level of Department under the oversight of a Deputy Minister reporting directly to the Minister. It is however noted that there are proposed public sector reforms recommended by the Governance Commission which, if adopted, will result in the phasing out of the short-term political post of Assistant Minister. Annex 3 shows the new structure of the MLME assuming that the recommendations of the Governance Commission are adopted. The technical management of each Department shall then be undertaken by a Director reporting to a Principal Administrative Officer (PAO), both permanent civil service posts. The general financial and administrative support functions for the Ministry shall be undertaken by a Director reporting to the PAO.

Although Annex 3 shows the Deputy Minister for Energy having oversight over the Energy as well as the Water and Environment Departments, the latter functions are currently under the oversight of the MLME's minerals division. The appropriate location of these functions is a matter of policy that is outside the scope of this document. This NEP provides details on the energy department and the details of the other departments are separately addressed in the Lands Policy and Mines Policy respectively. The proposed structure of the energy department is in Annex 4. It is designed to ensure that there is adequate attention to all cross-cutting issues as well as those relating to each energy sector. With this structure there are clear reporting lines for all public utilities and other energy sector agencies.

### Principal Administrative Officer for Lands, Mines and Energy

Under the proposed reorganization of the public service, a new position, Principal Administrative Officer for Lands, Mines and Energy, will be created, which reports directly to the Minister. The PAO, acting in

accordance with authority delegated by the Minister, oversees the Ministry's operational, financial, administrative, and other related functions of the GOL as defined in the NEP and supporting legislation. The PAO, who will be a permanent civil servant with relevant professional expertise and experience, will function as the Ministry's Chief Executive Officer. The Minister, working in collaboration with the Deputy Ministers, shall function as the board of directors of the Ministry providing policy guidance and exercising general oversight responsibility in accordance with the applicable governing laws.

### Director of Energy

The Director of Energy is a new position reporting to the PAO. The Director is the head of the Department of Energy, which is responsible for the following duties:

1. **Policy development and planning** – Development and review of energy policies, quality standards, and master plans based on recommendations from all stakeholders; convening of National Energy Committee meetings; and liaising with the Energy Regulatory Board.

2. **Licensing** – Coordination and administration of all support services required for the issuing of licenses and concessions in the sector; this includes but is not restricted to establishing licensing criteria and procedures with technical assistance from the government energy agencies, facilitating the processing of applications for investment and operating licenses.

3. **Monitoring and evaluation** – Measurement of the impacts and benefits of energy sector policies through regular reviews of government energy parastatal reports (budgets, operations, audits, policy recommendations, etc) as well as reviewing the activities of private players in the sector.

In the processing and granting of licenses and concessions in the energy sector, the Director of Energy, supported by the relevant divisions and units of the energy department, shall be the principal adviser to the Minister, ensuring that the requirements of the Public Procurement and Concessions Act are followed. The MLME shall develop the rules, regulations and procedures for the issue of licenses and concessions and recommend for approval by the Public Procurement and Concessions Commission. Following approval the MLME shall ensure that these are well publicized.

The Department of Energy shall have at least three divisions managed by Assistant Directors – the Division of Hydrocarbons with oversight responsibility over the petroleum sector, the Division of Electricity and Renewable Energy to look after the electricity sector and promote the development of renewable energy resources, and the Division of Energy Policy and Planning to look after all the cross-cutting issues.

## DIVISION OF HYDROCARBONS

### Purpose

This division shall have the following principal functions:

1. **Petroleum sector policy and plans** – Development and review of policies, quality standards, and master plans for upstream and downstream operations.

2. **Petroleum investment and operating licenses** – With technical assistance from the government energy agencies and parastatals, establishing licensing criteria and procedures for upstream and downstream operations; processing of applications for investment and operating licenses.

3. **Oversight responsibility over public and private sector operators in the sub-sector such as NOCAL, LPRC and the proposed successor company, the LNOC.**

Due to human resources and financial constraints, and to avoid creating unnecessary central bureaucracy the division's work shall start off by being handled in one office.

### Upstream Operations Unit

This unit is to be set up once the volume of work justifies the need for dedicated staff.

### Downstream Operations Unit

This unit is to be set up once the volume of work justifies the need for dedicated staff.

## DIVISION OF ELECTRICITY AND RENEWABLE ENERGY

### Purpose

This division shall have the following principal functions:

1. **Electricity sector policy and plans** – Development and review of policies, quality standards, and master plans for grid and off-grid and renewable energy investments.
2. **Licenses for generation, transmission, distribution, and supply of electricity** – Establishing licensing criteria and procedures with technical assistance from the government energy agencies and parastatals.
3. **Oversight responsibility over public and private sector operators in the sub-sector such as LEC, RREA, SPRA or LRA.**

Due to human resources and financial constraints, and to avoid creating unnecessary central bureaucracy, the division's work shall start off by being handled in one office.

### Grid Power Unit

This unit is to be set up once the volume of work justifies the need for dedicated staff.

### Off-Grid Power and Renewable Energy Unit

This unit is to be set up once the volume of work justifies the need for dedicated staff.

## DIVISION OF ENERGY PLANNING AND POLICY

### Purpose

This division shall have the following principal functions:

1. **Coordination of energy planning and policy development** – Development and review of National Energy Policy and Energy Master Plan documents; convening and following up on recommendations from the National Energy Committee.
2. **Cross cutting issues** – Energy efficiency, conservation and environment; gender issues.
3. **Reporting for ERB** – Liaison office for regulatory policy issues and recommendations; for independence, ERB's operating reports and budgets shall be approved by an appropriate committee of the Legislature. This is because the ERB's policy monitoring role includes oversight over the Executive Branch's policy setting process.

Due to human resources and financial constraints, and to avoid creating unnecessary central bureaucracy, the division's work shall start off being handled in one office.

### Energy Planning and Policy Unit

This unit is to be set up once the volume of work justifies the need for dedicated staff.

### Energy Efficiency, Conservation & Environment Unit

This unit is to be set up once the volume of work justifies the need for dedicated staff.

## ENERGY REGULATORY BOARD

### Purpose

Reporting to the Office of the President and the appropriate committee of the Legislature, the Energy Regulatory Board shall ensure a balance between stakeholder interests by monitoring the implementation of policies, plans, quality standards, and license provisions. The ERB shall discharge its mandate by undertaking the following principal functions:

1. **Economic regulation** – Monitoring of costs and enforcement of pricing principles; promoting fair competition and regional trade; making recommendations of pricing principles.
2. **Technical regulation** – Monitoring and enforcing of technical standards for products and services (safety, security, reliability, service responsiveness); recommending technical standards.
3. **Dispute resolution** – Consumer protection; investor protection; complaints handling; litigation.
4. **Stakeholder relations** – Information and publicity; administrative support services for the ERB.

Annex 5 shows the inter-linkages between the ERB and other stakeholder organizations. Due to the specialized nature of the skills that need to be developed, it is important to have the following four offices and functions, as a minimum:

### Office of Economic Regulation

**Cost monitoring and enforcing pricing principles** – It is important to note that the ERB role is not to establish prices, because these are automatically established by the policy requirement for cost-reflective pricing. The role of the ERB is to ensure that only the minimum allowable costs plus a fair rate of return are passed on to the customer. This will be done by reviewing budgets and investment plans developed by the different sector agencies whose operations are subject to the ERB's oversight. The rest of the economic regulatory functions can be added as capacity is built.

### Office of Technical Regulation

**Monitoring and enforcing of technical standards** – The ERB will need to employ technical experts who are sufficiently knowledgeable in the different energy technologies to be able to assess the reasonableness of technical standards and to supervise technical studies by consultants hired by the ERB to review standards for energy products and services. The actual standards will be established by the Government as part of its policy making function. The Bureau of Standards will work with the Department of Energy in developing quality standards appropriate to the provision of energy products.

### Office of Legal Affairs and Dispute Resolution

**Dispute resolution** – This is the Office that specializes in disputes related to the provision of energy services and products; appeals from the ERB are to be made to a competent court of law. Only questions relating to whether ERB acted in accordance with its charter shall be challenged in court. The Office shall also be involved in the drafting and review of laws and regulations and developing the procedures for the operation of the ERB.

### Office of Administrative Services

**Stakeholder relations** – Information and publicity; support services for ERB operations.

# LEGAL FRAMEWORK

## Purpose

The purpose is to provide clear and enforceable legal provisions to facilitate the implementation of the National Energy Policy.

## New Energy Law

This is a law to promote the orderly development of the energy sector in accordance with the National Energy Policy and to establish the ERB, the body responsible for regulating the energy sector in accordance with the sector laws. It should be noted that similar regulatory bodies are also designated as an Authority, Agency, or Commission. The appropriate designation of the regulatory body shall be determined through stakeholder consultations during the legislative process.

## New Electricity Law

The objective of the new law, which shall be a chapter of the Energy Law, is to regulate and promote the development of the electricity sector, to review the mandate of LEC in line with the National Energy Policy, create the successor company to LEC, and to provide for the establishment of the SPRA or LRA at an appropriate time.

## New Petroleum Law

The objective of the new law, which shall be a chapter of the Energy Law, is to regulate and promote the development of the petroleum sector and to review the mandate of NOCAL and LPRC in line with the National Energy Policy, create the successor company, the Liberia National Oil Corporation, at an appropriate time.

## New Renewable Energy Law

The objective of the new law, which shall be a chapter of the Energy Law, is to regulate and promote the development of the renewable energy sector and to establish the RREA and REFUND at an appropriate time.

# 7. STRATEGIC ROADMAP

## SMALL LIGHT TODAY, BIG LIGHT TOMORROW

President Ellen Johnson Sirleaf, in the dedication ceremony for the re-establishment of public power supply in Monrovia on July 26, 2006, summarized the strategic roadmap with the phrase "Small light today, big light tomorrow." This NEP provides the way forward from the small light to the big light.

The small light has been made possible through grant funding and the Government's own limited funds. In contrast, the bulk of the funds required for the big light will come from loans borrowed from banks. Therefore, while the small light has been a result of political and commercial decisions, the big light will be the result of decisions by banks. A decision to commit grant or equity funds is based on a balance of probabilities, analogous to the standard of proof in a civil court of law. A decision to commit debt funds is based on proof beyond reasonable doubt, analogous to the more onerous standard of proof in a criminal court of law. The focus of this NEP is to create the environment for bankable projects that will stand the exacting scrutiny and analysis by lenders.

The Government has adopted a three-pronged strategy towards the realization of the vision outlined in the NEP – the short term (**emergency phase**), the medium term (**capacity building phase**), and the long term (**development phase**). The three phases are defined by the role that Liberians have been and shall be playing in the implementation of the energy policy. In the emergency phase, Liberians have been recipients of grant funds and technical and management expertise (the donors have been providing fish). In the capacity-building phase, the Government will focus on building local expertise and institutions to enable them to replicate the donor-funded managerial and technical expertise (donors will be teaching fishing). This expertise will then launch the country into the long-term development phase when the country expects to realize its vision of universal access to modern energy services for all (Liberians will be fishing for themselves).

## STATEMENTS OF POLICY

1. ***It is the policy of the Government to keep its promises by undertaking all actions required to ensure visibility and maximum participation of Liberian stakeholders in the implementation of the NEP.***

2. ***It is the policy of the Government to adopt an implementation timeline to serve as a reference for performance measurement in the implementation of the NEP.***

## EMERGENCY PHASE

The emergency phase was launched in January 2006 and is now coming to an end with the finalization of the National Energy Policy. Although during this phase several pilot projects have been implemented and a few individuals and communities have been able to benefit, the main achievement from a national point of view has been the development of this energy policy, which is to serve as an agenda for action. The projects and programs have provided lessons and support for the development of the NEP.

## CAPACITY BULDING PHASE

The period 2008 to 2015 is for building local capacity for implementation of the energy policy. Significant donor assistance shall continue to be required during this phase and the projects to be implemented during this phase are expected to culminate in the achievement of the 2015 Millennium Development Goals as defined in the policy document. Some of the critical-path activities required to ensure the achievement of the targets that have been set are as follows:

1. **Drafting and enactment of enabling legislation** – Many of the policy recommendations require an enforceable legal framework and therefore, the immediate task is to draft the appropriate laws and get the Legislature to enact them at the earliest opportunity.

2. **Setting up appropriately resourced institutions** – This activity can progress in parallel with the legislative work by beginning with prototypes. The role of the prototypes will be to coordinate and roll out emergency phase activities as capacity building for the official institutions. The prototypes are also an effective tool for communicating the Government's commitment to the implementation of the energy policy. GOL has already initiated the process of setting up a prototype Rural and Renewable Energy Agency and Rural Energy Fund. A prototype Energy Regulatory Board can also be set up as another capacity building exercise.

3. **Development of energy master plans** – Currently, there are a lot of uncoordinated donor-driven initiatives that, as a result, have a limited development impact. It is necessary to develop both grid and off-grid energy master plans, focused on both supply-side and demand-side options, in order to have an orderly and more effective national energy development program consistent with the principles and goals outlined in the NEP. One of the advantages of setting up the prototype institutions is to be able to immediately embark on the development of the master plans.

4. **Facilitating the first major independent power producer investments** – The Government has received proposals for medium-term power development projects that require immediate action to ensure their successful and timely implementation. An operationally efficient and financially viable transmission and distribution business in Monrovia is the minimum requirement for bankable IPP or utility development projects. These projects will require bank funding for at least 70% of project costs and IPPs and the utility will need to demonstrate beyond reasonable doubt that they will have the ability to deliver power and collect revenue from the end-users to pay into an escrow account for loan repayment. At present, the Government recognizes that LEC does not satisfy the requirements for a bankable power purchase agreement and therefore there is a need to attend to this deficiency as a matter of urgency.

5. **Rehabilitation of petroleum storage and distribution infrastructure** – Although LPRC is operating profitably, its operations are based on infrastructure that is in serious and urgent need of rehabilitation. The Government does not have the capital required and needs to urgently mobilize significant private sector investment. The Government must translate its stated policy of involving the private sector to the greatest degree possible by taking immediate action to facilitate the private sector investment required to rehabilitate storage tanks and pipelines.

6. **Allocation of all vacant petroleum exploration blocks** – It is important for the GOL to establish conclusively whether or not the country has commercially exploitable oil and natural gas resources. It is therefore essential to grant exploration licenses for all the vacant off-shore blocks at the earliest possible opportunity.

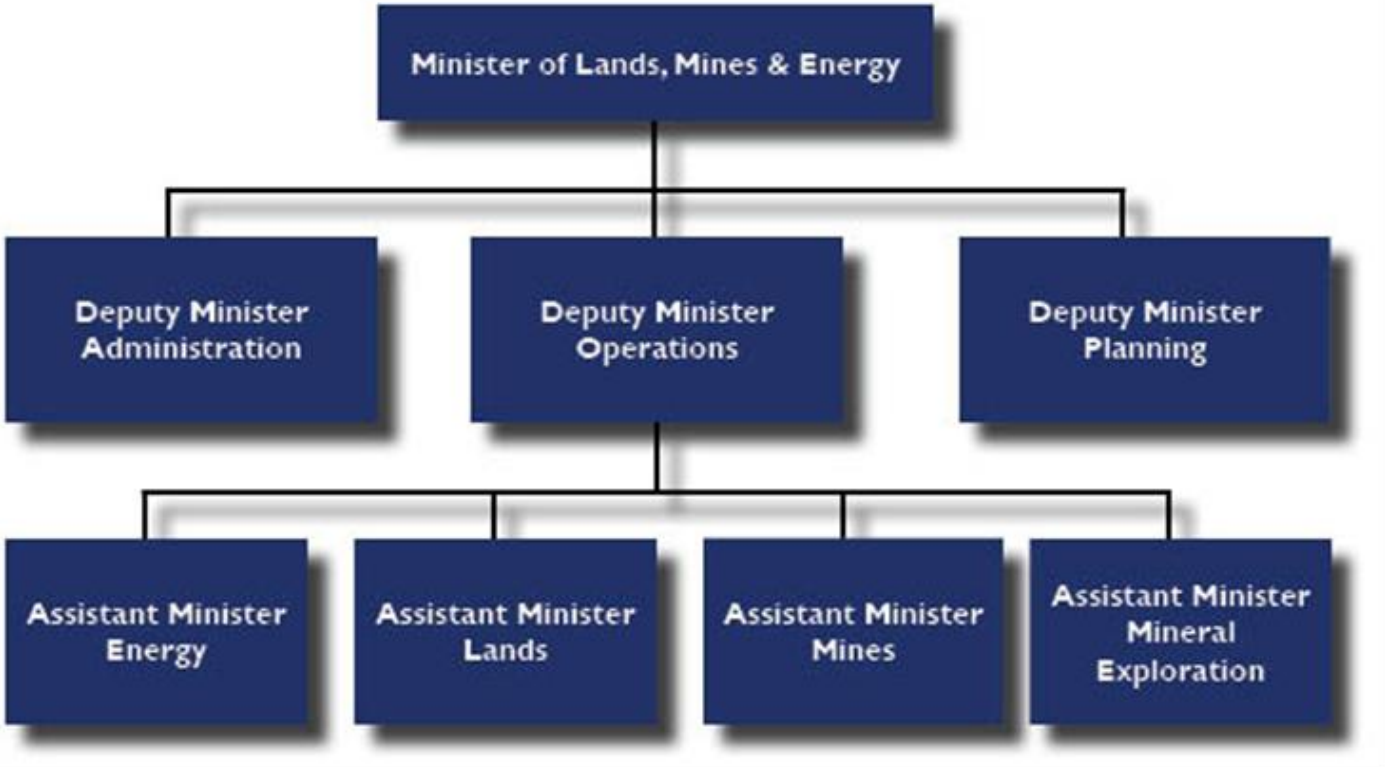
7. **Rehabilitation of Mount Coffee** – This is a project that is required to lay the foundation for the large hydropower developments along the Saint Paul River and the other major rivers, which are needed to provide more affordable power for the country. It will be a challenging exercise for the developers to raise the capital required, and the starting point will again be a bankable power purchase arrangement.

## DEVELOPMENT PHASE

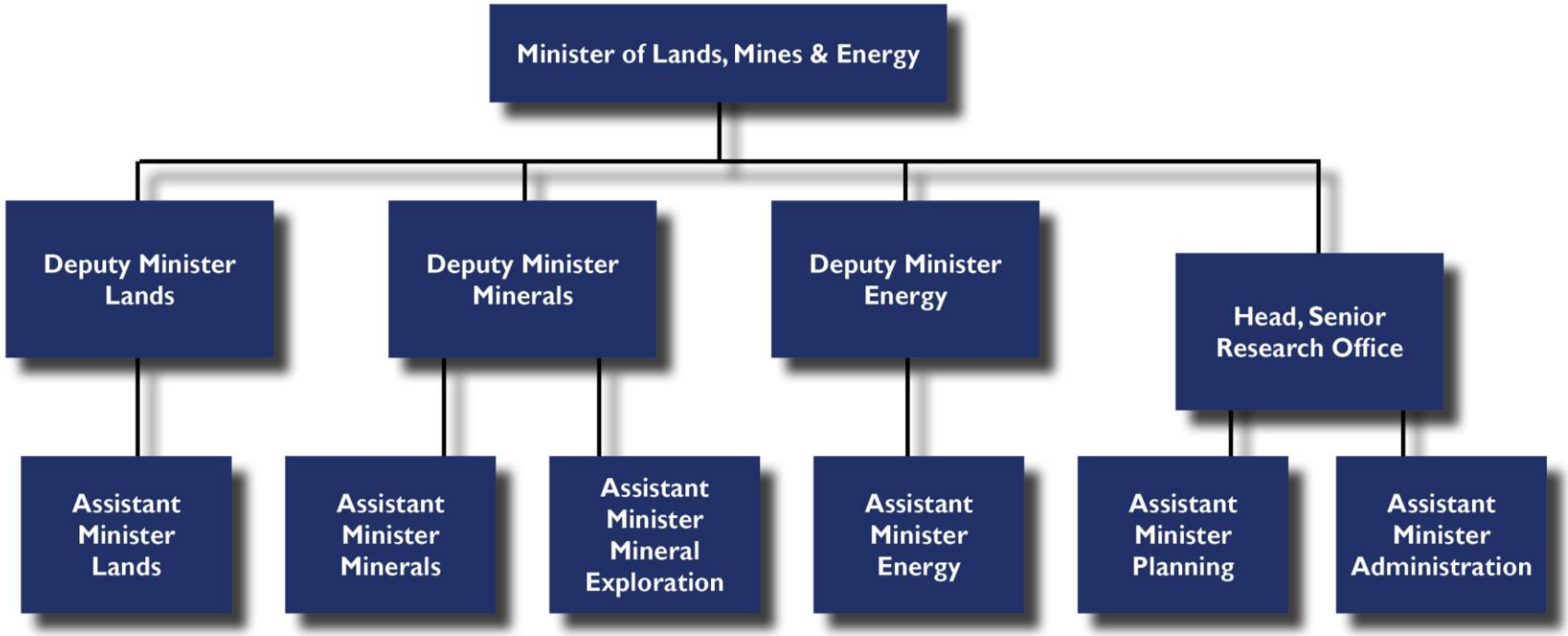
The development phase is expected to be the period beyond 2015, which will build upon the achievements of the capacity building phase. Assuming that the policies and principles outlined in the NEP are followed, by that time the new institutions, such as RREA and the ERB, and the restructured public utilities and companies, will be fully resourced with skilled and experience people. The projects and programs

implemented during the emergency and capacity building phases will lead to improvements in energy access in the medium term. Once the system is stabilized and the economy resumes a reasonable rate of growth, the Government can look at longer-term options such as development of the country's large-scale hydropower potential, the creation of public-private partnerships for exploiting opportunities for imports and exports of electricity either directly with neighboring countries or via the West African Power Pool, and the development of the country's other vast renewable energy resources.

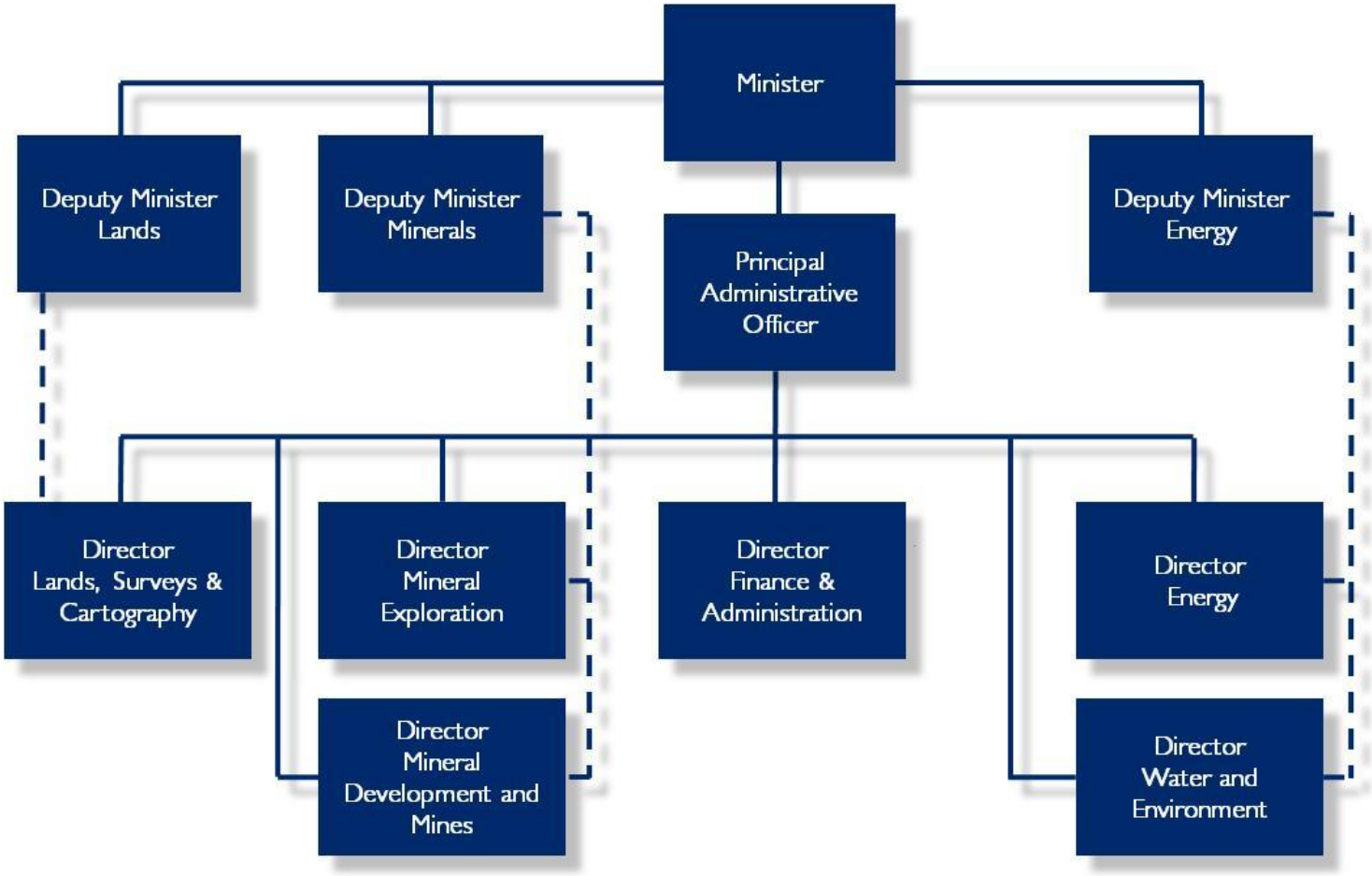
# ANNEX 1. CURRENT ORGANIZATION CHART OF THE MLME



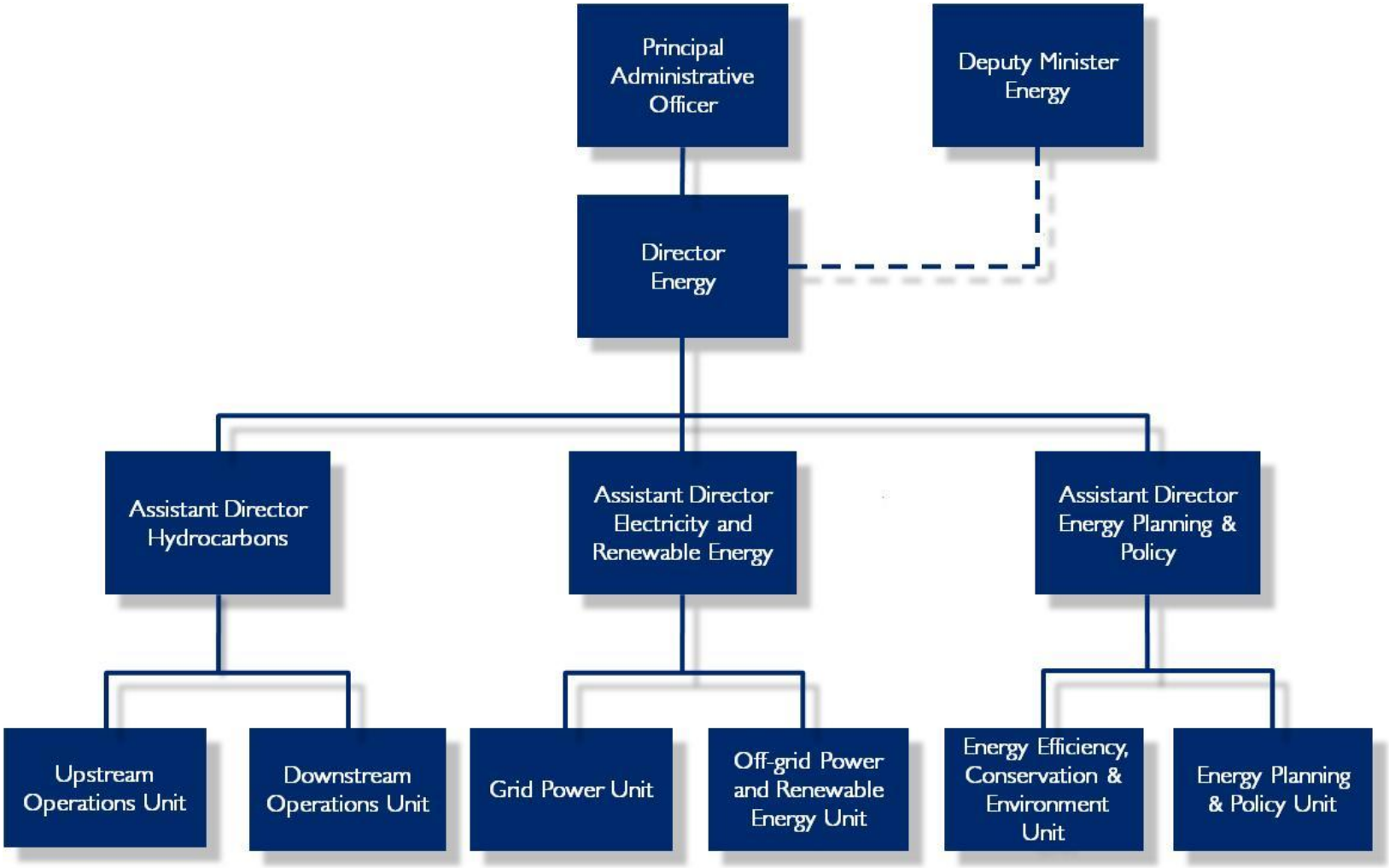
# ANNEX 2. REORGANIZED MLME (BEFORE PROPOSED PUBLIC SECTOR REFORMS)



# ANNEX 3. REORGANIZED MLME (AFTER PROPOSED PUBLIC SECTOR REFORMS)



# ANNEX 4. PROPOSED DEPARTMENT OF ENERGY



# ANNEX 5. PROPOSED OPERATING FRAMEWORK FOR ENERGY REGULATORY BOARD