MALAWI GOVERNMENT

Ministry of Natural Resources, Energy and Mining
Department of Energy Affairs

CONSULTANCY SERVICES TO CARRY OUT MALAWI ENERGY POLICY REVIEW

DRAFT NATIONAL ENERGY POLICY

Complied by:

pwc

Foreword

This section will not exceed one page and will include:-

(a) what the policy is all about;
(b) why the policy is necessary;
(c) how the policy is linked with national strategic priorities; and
(d) a statement on political commitment to the issue.

This section will be signed by the Minister responsible for Energy.

Preface

This section will not exceed one page and may include statements on:-
(a) implementation opportunities and challenges;
(b) national goals in the sector in which the policy applies;
(c) major groups of stakeholders consulted; and
(d) international commitments.

This section will be signed by the PS for Energy Ministry.

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ACRONYMS

AfDB	African Development Bank
AUC	African Union Commission
CA	Catchment Area
CDB	China Development Bank
CDM	Clean Development Mechanism
CO	Carbon Monoxide
CO2	Carbon Dioxide
COCO	Company Owned Company Operated
CODO	Company Owned Dealer Operated
COLEDO	Company Leased Dealer Operated
COMESA	Common Market for East and Southern Africa
CSI	Coal Supply Industry
DfID	Department for International Development
DoE	Department of Energy
DODO	Dealer Owned Dealer Operated
DSM	Demand Side Management
EAPP	East African Power Pool
EDVP	Ethanol Driven Vehicle Project
ESI	Electricity Supply Industry
ESCOM	Electricity Supply Corporation of Malawi
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESSP	Energy Sector Support Project
ETHCO	Ethanol Company of Malawi
FDI	Foreign Direct Investment
GenCO	Generation Company
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GoM	Government of Malawi
GTF	Global Tracking Framework
ICA	Investment Climate Assessment
IDA	International Development Association
IEA	International Energy Agency
IFC	International Finance Corporation
IHPS	Integrated Household Panel Survey
IPP	Independent Power Producer
JICA	Japanese International Cooperation Agency
kV	Kilo Volt
kWh	Kilo Watt hour
LDC	Least Developed Country
LED	Light Emitting Diodes
LF	Liquid Fuel
LF&GSI	Liquid Fuel and Gas Supply Industry
LPG	Liquid Petroleum Gas
MAREP	Malawi Rural Electrification Programme
MBS	Malawi Bureau of Standards

MCC	Millennium Challenge Corporation
MDG	Millennium Development Goals
MERA	Malawi Energy Regulatory Authority
MGDS	Malawi Growth & Development Strategy
MIGA	Multilateral Investment Guarantee Agency
MNREM	Ministry of Natural Resources, Energy and Mining
MVA	Mega Volt Ampere
MW	Mega Watt
MWK	Malawi Kwacha
NCST	National Commission for Science and Technology
NEPAD	New Partnership for Africa's Development
NPCA	NEPAD Planning and Coordinating Agency
NEP	National Energy Policy
NGO	Non-Governmental Organization
NOCMA	National Oil Company of Malawi
NSO	National Statistics Office
OMC	Oil Marketing Company
ORES	Other Renewable Energy Sources
PCG	Partial Credit Guarantees
PCL	Press Corporation Limited
PIL	Petroleum Importers Limited
PIDA	Programme for Infrastructure Development in Africa
PIDA-PAP	PIDA Priority Action Program
PRG	Partial Risk Guarantees
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PSP	Pico Solar Products
PwC	PricewaterhouseCoopers
REA	Rural Electrification Agency
RE	Renewable Energy
RER	Renewable Energy Resources
RET	Renewable Energy Technologies
ROWs	right of ways
SADC	Southern Africa Development Community
SAPP	Southern Africa Power Pool
SDGs	Sustainable Development Goals
SE4All	Sustainable Energy for All
TDC or T&D	Transmission and Distribution Company
UN	United Nations
UNCB	United Nations Convention on Biodiversity
UNCD	United Nations Convention on Desertification
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
USD	United States Dollar
VAT	Value Added Tax
WEO	World Economic Outlook

1.0 INTRODUCTION

1.1 Background

In Malawi the energy sector is envisaged to play a central role in enhancing the performance of the economy; improving delivery of social services; creating investment and employment opportunities; and reducing poverty. The country is focused on the energy sector as the prime mover for Agriculture and Industry, two sectors which contribute about 50% of the National GDP of Malawi (the contributions from Agriculture and Industry are 33% and 19% respectively). Improvement in the energy sector is expected to positively impact on other sectors, through well-defined policies and institutional frameworks, international assistance from development partners and partnerships with the private sector.

The Ministry of Natural Resources, Energy and Mining (MNREM) provides policy direction and guidance on the sustainable development and utilization of energy sources in Malawi, while the Malawi Energy Regulatory Authority (MERA) is mandated, among other functions, to regulate utilization of energy sources.

In recognition of this, the GoM through the MNREM, prepared a National Energy Policy (NEP) in January 2003. The motivation for the NEP was founded on three main considerations as follows:

1. Developments in the energy sector have an important bearing on the success of economic development initiatives in the country.
2. Although Malawi is relatively well endowed with potential energy resources (biomass, coal, hydro, wind and solar energy), their full potential is far from being realized. A number of structural and institutional challenges must be overcome to unlock this potential.
3. While planning is essential to formulating policy for energy, globally the approach to planning has taken a paradigm shift over the past two to three decades. The role of the Government has changed from direct investment and control to policy formulation and governance. A greater reliance on market arrangements, competition and private sector participation will make a big impact.

The GoM has noted that while some considerable success has been attained in reforming and expanding the energy sector since the 2003 NEP was developed, a lot still remains to be achieved, if the energy needs of all Malawians are to be met.

One area that needs special attention is the social and gender commitments of the NEP. The NEP successfully identified the importance of social and gender perspectives in both the supply and demand dynamics of the sector but failed to differentiate the respective needs and usage of energy of men and women or their specific challenges in accessing energy sources. Much as the policy mentions that gender will be mainstreamed in the planning and implementation of energy programs, in practice, very few programs were developed in line with these strategies. The major contributing factors were:

- the approach to treat gender as a stand-alone issue without mainstreaming it in all areas of the NEP;
- lack of an implementation and monitoring and evaluation framework;
- inadequate knowledge of gender policy commitments by the supply side;
- weak technical capacity in gender programming;
- non-implementation of gender responsive budgeting; and

- lack of leadership and accountability.

Furthermore the new policy is also taking cognizance of the following issues:

- Energy pricing: in order to encourage more private sector participation in energy production, the pricing issue is of utmost importance.

- Regional integration and international cooperation: currently Malawi is not interconnected to the regional grids of the SAPP and the EAPP.

- Energy and climate change: this issue requires more attention. The 2015 floods gave a clear warning that this issue must be taken seriously.

- That biomass is still an important source of energy for majority of Malawians for many years to come

- The new United Nations Sustainable Development Goals (SDGs) include access to affordable, reliable and modern energy services for all as Goal No. 7 to be achieved by 2030. This is consistent with the UN agenda of Sustainable Energy for All by 2030, pursued since 2011.

- Although there have been some achievements, more than 10 years after the NEP, Malawi continues to remain a low income country in which more than 90% of the population do not have modern and sustainable energy services.
- The economy continues to rely on the export of unprocessed agricultural products, industrialization is still unacceptably low, mining and manufacturing sectors are not well developed as there is insufficient electrical power, and most of all poverty levels are still very high.
- Decentralisation of the Department of Energy: Government will endeavour to decentralise the Department of Energy as to have officers in the districts.

In view of the above, the GoM has decided to prepare a new version of the NEP that should reflect the latest developments and new national goals. In connection with the preparation of the NEP document, the GoM is emphasizing on the need to have a clear implementation plan with time-bound deliverables and capacity building in modern energy access, generation and delivery The National Energy Policy, being the framework for the development of the energy sector in Malawi, should set out clear updated goals, objectives, strategies and priority actions.

1.2 Structure of the document

This energy policy document is divided into ten chapters. The first chapter is the Introduction, which gives background to the policy in terms of historical background, current state of affairs, including existing challenges and Government responses to these and what the policy aims to achieve.

Chapter two deals with the context i.e. an analysis of the drivers of this policy which include the social economic and political context. It also analyses the international development and protocols and development commitments in relation to energy, as well as regional commitments and agreements on energy. It also analyses the national context in terms of the development commitments in relation to energy such as MDGs, Vision 2020, Gender and

Legal frameworks, and Constitutional demands. All these have shaped the development of this National Energy Policy.

The broad Policy Vision, Goals and Objectives are presented in Chapter three. These are in general terms. The next five chapters (four to eight) contain actual policy statements. These chapters are divided according to energy source or type. Each chapter is divided into three parts. The first part analyses the current status of that energy type in Malawi in terms of the main issues that require policy direction. This is followed by objectives of the policy in relation to that energy type. Finally it lists a set of policy statements for that energy type. Chapter four, which is on electricity has further been subdivided into subchapters on Generation, Transmission, Distribution, Rural Electrification and Renewable Energy.

Chapter 9 is dedicated to Energy Efficiency, while Chapter 10 deals with institutional arrangements and linkages (roles and responsibilities of each institution), implementation plan and timelines for achieving those plans, and finally it provides a monitoring and evaluation matrix.

2.0 CONCEPTUAL CONTEXT

2.1 Social economic and political context

The Government understands that sustainable social economic and environment growth depends critically on access to modern and reliable energy. If access to energy is poor, it becomes very difficult to attract investment in any sector of the economy; and without investment flows, growth prospects are limited. As the World Bank's Vice President put it "Access to energy is absolutely fundamental in the struggle against poverty ... Without energy, there is no economic growth, there is no dynamism and there is no opportunity."[1]

Therefore, tackling the different facets of energy poverty for women and men can be a game changer in addressing poor development indicators in order to accelerate national growth and development outcomes. Among other areas, the energy sector in Malawi has a clear role to play in improving development indicators related to youth and girl child education, labour productivity, women's economic empowerment, maternal health, reducing gender based violence etc.

However, in much of the world, especially developing countries, access to energy remains low and supply is often unreliable. At the same time, the world's energy choices are leading to levels of pollution that are substantially shortening people's lives and causing climate change. The energy and growth challenge requires identifying solutions to these problems of access to inexpensive and reliable energy, while limiting environmental damage and guarding against disruptive climate change.

According to the World Bank's 2009 Country Economic Memorandum, insufficient or inadequate energy is consistently identified as a key constraint to economic growth in Malawi. The Constraints Analysis done by the Millennium Challenge Account - Malawi in 2008 identified energy as the most binding constraint to growth. The 2008 Business Climate Survey cited erratic electricity supply as the primary obstacle to doing business in Malawi. Poor quality of supply was reported as the fourth more serious obstacle by firms in the 2006 Investment Climate Assessment (ICA); The Africa Infrastructure Diagnostic (AID) of 2008 reports that Malawi has the worst (electricity) supply reliability record of the 24 countries surveyed and estimates that the hidden cost of inefficiencies in electricity supply are equivalent to 4.4 percent of GDP – the most severe in sub-Saharan Africa.

2.2 International context

The International Energy Agency (IEA) themes are energy security, environmental protection and economic development. The agreed international goal of reducing greenhouse gas (GHG) emissions is the driver for many energy policies world-wide, and is addressed by both improved energy efficiency and a higher level of renewables in national energy systems. The need to find economically efficient and sustainable approaches clearly concerns member countries. More generally, a number of countries recognise the negative impact of rising energy prices on consumers.

The international oil market has also been affected since the NEP 2003 Policy was formulated. The global oil market has seen an increase in the price of crude oil from an average nominal price of US$27.69 in 2003 to a record high of US$ 145 in 2008. The increase in the global oil price directly led to an increase in the players in the oil industry. In

[1] Rachel Kyte, Vice President and special envoy for climate change, World Bank

turn, the increase in the number of players has also directly led to a recent price slump in the oil industry. Further, advances in biofuel technologies have led to an increase in biofuel production globally. The changes in the global oil arena resulted in Malawi having to pay more for the same amount of oil. On the positive side, advances in biofuel technologies have spurred interest in liquid bio-fuels.

Since 1973, coal consumption has grown faster than that of any other source of energy (see the graph below). While environmental organizations actively campaign against its use, coal has allowed hundreds of millions of people in less developed countries to escape dire energy poverty. Between 1990 and 2010, about 830 million people—the vast majority in developing countries—gained access to electricity due to coal-fired generation. Additionally, for every person who obtained access to electricity over that period from non-hydro renewable sources, such as wind and solar, about 13 gained access due to coal.

Coal-fired-generation capacity continues to grow in wealthy countries, too. Given the coal industry's recent history and political influence and the ongoing surge in global coal use, there is little reason to believe that any of the much-discussed international efforts to impose a cap or tax on carbon-dioxide emissions will prevail. An analysis will however have to be made to compare the cost of coal powered electricity and renewable energy production. Further cognizance has to be taken of the fact that there seem to be a movement from Development partners to favour financing clean energy projects than coal.

World Bank data show that, between 1990 and 2010, some of the biggest gains in access to electricity occurred in regions that have long been energy-poor. For instance, between 1990 and 2010, the percentage of people living in Sub-Saharan Africa who gained access to electricity increased from 23 to 32 percent.

Given that coal will remain an integral element of the global electricity market for decades to come, policymakers should promote the best combustion technologies available. More effective combustion allows a given power plant to produce more electricity while producing fewer emissions of carbon dioxide and traditional air pollutants. Thus the important task is to use technologies that avoid or drastically reduce social, environmental as well as economic factors.

Regarding the international context during the preparation of the NEP 2003, Malawi's international relations had shifted significantly due to a move towards multiparty democracy in 1994 resulting in a fundamental shift in the composition of the development partners. Traditional donors had returned with a shift in emphasis towards the social sectors, governance and transparency, environmental conservation, human rights and accountability among others.

The above notwithstanding the country has since 2003 experienced a shift again towards infrastructure. A good example is the US Government which set up the Millennium Challenge Corporation (MCC). The MCC is aimed at scaling up assistance to developing countries. The MCC is based on the premise that economic development and poverty reduction succeeds best where it is linked to free market economic and democratic principles and policies, and where governments are committed to implementing reform measures in order to achieve such goals. Malawi has benefited from the MCC with a grant of $350.7 million to strengthen ESCOM's transmission and distribution networks and modernize the Nkula A generation plant. World Bank has been one of the biggest financiers and continues to fund the power sector in Malawi. The country has also benefited from JICA who, apart from funding the MAREP, are also financing the expansion of Malawi's power generation capacity at Tedzani Power Station.

In addition, the US Government is scaling up partnerships on powering Africa through a new initiative called Power Africa. **Power Africa** is a new five-year United States of America Presidential initiative aimed at supporting economic growth and development by increasing access to reliable, affordable, and sustainable power in Africa.

We are beginning to hit environmental and climatic global limits and there is now, more so than ever before, serious consideration being given to environmental and climatic issues. Malawi is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Desertification (UNCD) and the United Nations Convention on Biodiversity (UNCB). Malawi signed up these conventions within the backdrop of its vulnerability to climate change. Malawi's vulnerability to climate change arises mainly from socio-economic, environmental demographic and climatic factors. These include a narrow economic base; limited agro-processing facilities; over-dependency on rain-fed agriculture and on biomass for energy; inadequate health facilities; and poverty, exacerbated by drought, floods, natural disasters and population pressure. The result is adverse impact on food security, water availability and quality, and energy, overwhelmingly affecting sustainable livelihoods especially for rural communities. Human activities that adversely change the atmosphere's composition include burning of fossil fuels and land surface changes arising from such activities as deforestation, urbanization and desertification.

The above has resulted in strong support from bilateral donors such that apart from support towards infrastructural development in the energy sector, donors are providing support for improved technologies both on the supply side as well as the demand side. A case in point on the supply side is support for improved technologies for charcoal curing as well as improved cook stoves. On the demand side donors are supporting efforts that will enable consumers to take measures to improve efficiency in energy use by adopting more efficient combustion systems and implementing demand side management (DSM). DfID, Irish Aid and Norway are some of the institutions and countries actively providing assistance in these areas. However in monetary terms a very high proportion of funding still goes to electricity and very little for renewables (biomass etc.) yet majority of the population rely on biomass and other renewables.

The MDGs had a limited environmental focus, and no specific goal on energy, and the SDGs address this deficit. SDG No. 7, which is about 'ensuring universal access to affordable, reliable and modern energy services, has four targets that should be met by 2030. There are: increasing substantially the share of renewable energy in the global energy mix; doubling the global rate of improvement in energy efficiency; enhancing international cooperation to facilitate access to clean energy research and technology (including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology), and promote investment in energy infrastructure and clean energy technology; and expanding infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular land-locked developing countries in accordance with their respective programmes of support

Going forward, the SDGs will strengthen the global energy agenda that has so far been be shaped by the Sustainable Energy for All (SE4All) agenda. The SE4All was launched in September 2011 by the United Nations Secretary General Ban Ki-Moon. The SE4All aims to achieve three main goals by 2030: Ensuring universal access to modern energy services; doubling the global rate of energy efficiency; and doubling the share of renewable energy in the global energy mix. The practical attainment of the interrelated SDGs and SE4All agendas means there should be deliberate and consistent measures towards identifying and responding to gender differentiated energy needs that match with the reality that energy issues and solutions do not impact women and men in similar ways. Therefore, it is clear that the energy sector should take responsibility to ensure that all citizens enjoy and benefit from

sustainable energy access—because energy poverty limits the choices and capabilities of men and women.

Where women are concerned, the Convention on the Elimination of All Forms of Discrimination Against Women (1979), ratified on 12 March 1987, particularly commits State parties to take all appropriate measures to ensure that rural women enjoy adequate living conditions, including in relation to electricity supply (Article 14). Further, the pursuit of universal access to energy for women is compatible with targets under SDG No. 5 (achieve gender equality and empower all women and girls) concerning: enhancing the use of enabling technology to promote the empowerment of women; and adopt and strengthening sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.

2.3 Regional context

Malawi continues to be an active member of a number of regional, continental and global organisations with strong agendas for energy development. Regionally, one of the most important bodies is the SADC, which advocates regional integration and cooperation. Work is now underway to create a Tripartite Free Trade area comprised of SADC, COMESA and the East African Community. The Tripartite negotiations have focused on harmonising the Regional Economic Communities (RECs)' programmes in the areas of trade and infrastructure. Accordingly, the Tripartite Task Force has defined a list of priority infrastructure projects in the Energy, Transport and Telecommunications sectors.

The African Union Commission (AUC), NEPAD Agency (NPCA) and the African Development Bank (AfDB) have developed the continental and consensual Programme for Infrastructure Development in Africa (PIDA), which provides a framework for the development of African infrastructure (2011-2040). The focus of PIDA is on regional projects and programs. For the energy sector, the PIDA Priority Action Program (PIDA-PAP), if implemented, will boost energy trade within and between the power pools and between the power pools. This will have a positive impact on:

- the cost of the kWh due to economies of scale (implementation of big projects serving many countries);
- energy mix (countries with dominant hydro potentials supplying those with dominant thermal (gas and coal) potentials); and
- increased access to modern energy services, which in turn will trigger increased access to clean water and improved health care system.

In addition to this, the AfDB is also a partner to the Power Africa initiative and serves as a regional anchor of the SE4All hub in Africa.

Closer to home the SADC has, through its *Energy Protocol (1996)* and its *Energy Cooperation Policy and Strategy (1996),* identified four key areas in which energy can contribute to regional integration: trade in energy, investment and finance, capacity building and training, the exchange of information and the sharing of experience. The establishment of the Southern African Power Pool (SAPP) and SADC Energy Commission has cemented institutional modalities for attaining these policy goals. Currently power trade in the SADC region is dominated by bilateral agreements instead of multilateral agreements. Member states are much more comfortable in executing long-term power purchase agreements bilaterally to secure their energy interests. However Malawi is not yet connected to the SAPP Grid. Nevertheless, the country exports to the border towns of Mozambique and Zambia.

Malawi is a signatory to the SADC Protocol on Energy and has a duty to adhere to it. Article 2 of this protocol provides as follows:

For the purpose of this Protocol, Member States shall:

i *Use energy to support economic growth and development, alleviation of poverty and the improvement of the standard and quality of life throughout the Region.*

ii *Use energy to promote collective self-reliance among Member States.*

iii *Ensure that the development and use of energy takes cognisance of the gender realities of the Region.*

iv *Encourage the development and transfer of science and technology related to energy through the promotion of research and development and the evolution and use of comparable methods and standards.*

v *Promote and encourage the direct participation of citizens and communities in the development and use of energy.*

vi *Ensure that the development and use of energy is environmentally sound.*

vii *Create a conducive environment for the private sector to participate fully in energy development in the Region.*

Since women suffer most energy poverty, the protocol's call for SADC Member States to take into account 'gender realities in the development and use of energy' is significant. This obligation is further cemented by the Protocol to the African Charter on Human and People's Rights on the Rights of Women in Africa (2005), which urges State parties to promote women's right to live in a healthy and sustainable environment through research and investment in new and renewable energy sources and appropriate technologies, and facilitate women's access to, and participation in their control (Article 18).

Malawi has committed to all these regional objectives. These objectives have informed the new Energy Policy.

2.4 National context

2.4.1 Physical characteristics

Malawi is a land-locked country located in Southern Africa, and bordered by Mozambique, Zambia and Tanzania. The country is about 900 km long and 80 - 161 km wide, with a total surface area of 118,484 km^2 (11.8 million ha), of which 80% is land. The remaining 20% is covered by water, mainly comprising Lake Malawi, which is about 586 km long and 16 - 80 km wide. The rest of the water area is made up of the following lakes: Lake Chilwa, Lake Malombe and Lake Chiuta and there are also rivers, with the majority of them flowing into Lake Malawi. The altitude ranges from almost sea level to over 3,000 metres. Rainfall ranges from 800 mm to over 2,500 mm per annum in low and highlands areas, respectively. It has a cool dry season (May - August, with a mean temperature of 17 degrees Celsius), a hot dry season (September - October, with a mean temperature of 29 degrees Celsius) and a hot wet season. Average daily solar irradiation is 21.1 MJ/m^2/day. This climate allows the growth of tropical and sub-tropical crops including cereals, tobacco, cotton, sugar and tea. The country is divided into three administrative regions namely the Northern Region, the Central Region and the Southern Region.

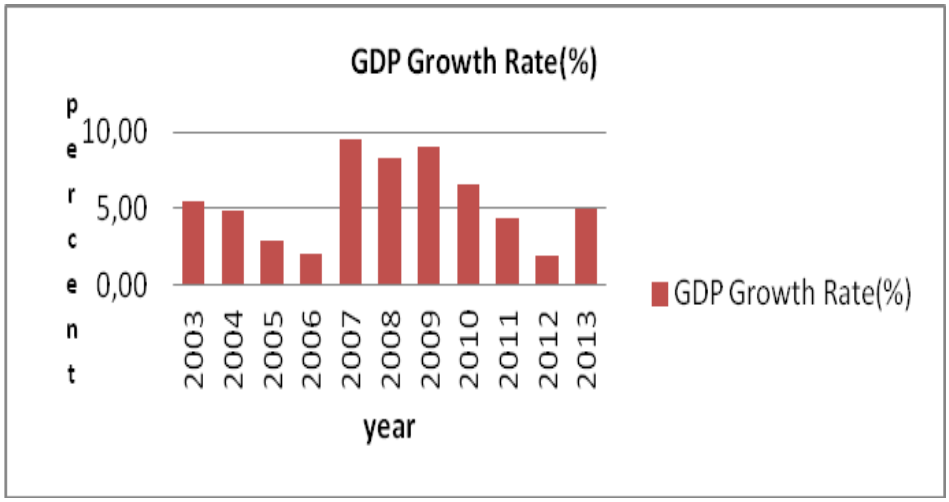
2.4.2 Demography

According to the 2008 census the Malawi population was 9.9 million in 1998 and was projected to increase to 16.35 million in 2013. The annual growth rates in the Northern, Central and Southern Regions were 3.3%, 3.1% and 2.4% respectively. The overall growth rate was 2.8% according to the 2008 National Census. This high population growth rate means that the population is projected to reach 40 million by 2040.

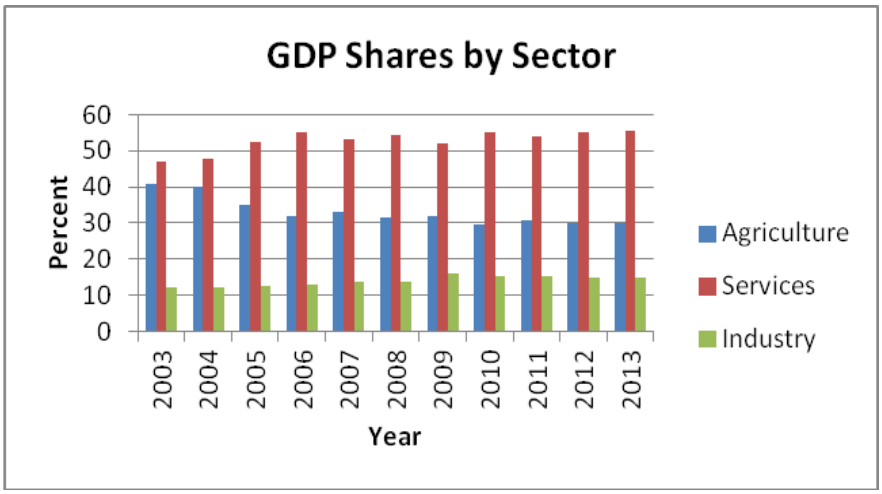
In 2008, the overall population density (number of persons/km^2) had increased to 139 from 105 in 1998. Across the regions there were more persons per square kilometre in 2008 than in 1998. The Southern Region was the most densely populated (184 persons/km^2), whereas the Northern Region was the least densely populated of the three regions at 63 persons/ km^2. The population density in the Central Region stood at 155 persons/ km^2. Urban population has been on the increase from about 850,000 in 1987 to 1.4 million in 1998 and to 2 million in 2008. The Rural population is estimated at 84.7% of the total population and is comprised mostly of small holder farmers, predominantly women.

2.4.3 The Economy

Malawi is one of the least developed countries in the world (in the bottom 10%) with a purchasing-power-parity (PPP) based Gross Domestic Product (GDP) per capita of about USD 780 in 2013. GDP composition by sector in 2013 was 27% Agriculture, 18% Industry and 54.2% Services.



Agriculture is the mainstay of Malawi's economy, and women contribute about 70% of the labour. It supports 84.7% of the population residing in rural areas and accounts for 27% of the GDP, 90% of export earnings, and 46% of wage employment. Over 80% of the labour force is engaged in agriculture. Principal exports include tobacco (64%), tea (15%-20%), sugar (8%), cotton (2.5%), coffee (2.5%) and pulses (2.6%).



According to the Malawi Economic Report by the World Bank of 2014, an analysis of the IHPS data shows that the rate of incidence of poverty has fallen slightly from 40.2% in 2010 to 38.7% in 2013. Urban areas recorded an increase in poverty from 17.9% in 2010 to 26.2% in 2013, while rural areas experienced a decline in the share of those who are poor (although the overall rate of poverty remains much higher in rural areas). The proportion of the population considered poor has declined over the same period in the Northern Region (from 50.2% to 43.3%) and the Southern Region (45% to 37.3%), but risen in the Central Region (from 33,5% to 39%). World Development Indicators suggest income distribution is highly inequitable and has worsened from 2004 (0.4) to a national gini-coefficient of 0.46 in 2010.

The GoM, in an effort to reduce poverty and achieve sustainable economic growth, developed the Malawi Growth and Development Strategy (MGDS) in 2006. The MGDS was expected to transform the country from being a predominantly importing and consuming economy to a predominantly manufacturing and exporting economy. Following the development of the MGDS, Malawi's real annual Gross Domestic Product (GDP) growth rate reached 9.7% in 2008 as a result of a steady growth in agriculture whose share in the economy was estimated at 31% in 2011. The development of the current MGDS II (2011-2016) represented a policy shift from that of social consumption to that of sustainable growth and infrastructure development. The rationale was to review the strategic link between Agriculture, which is the mainstay of the economy, and other sectors to see how it can be improved to accelerate growth and development, with a view to meeting the goals of transforming Malawi into a technologically driven middle income industrial nation. However, the GDP growth stabilized at 9% in 2009 after which it began to decline, reaching its lowest level of 1.9% in 2012. The dismal GDP growth has been attributed to the poor performance of the Agriculture sector in the 2011/12 season, a persistent shortage of foreign exchange and the resultant fuel shortages, thereby leading to economy-wide productivity losses. The year 2013 saw an economic recovery with GDP registering growth of 5 percent.

GDP growth in 2014 is estimated to have increased to 6% from a growth rate of 5% in 2013, led by strong outcomes from the agriculture, wholesale/retail trade, and information and communication sectors. The ready availability of foreign exchange and fuel appear to have supported the recovery in economic activity. All major sectors of the economy registered positive growth except the Mining sector, which was adversely affected by the suspension of Uranium production at the Kayelekera Mine since June 2014.

Exports were set to have grown by 7% during 2014, driven by a recovery in tobacco production as well as continued export growth in traditional (tea, sugar, cotton) and non-traditional commodities (such as edible nuts). Growth in these sectors partially compensated

for the closure of the Kayelekera Mine, which by 2013 was exporting the equivalent of one-third of total tobacco exports. Imports grew at about 3.7 percent during 2014, sustained in part by the imports required by a large power plant investment Kapichira II.

Following the "Cashgate" public financial management scandal in 2013, the withdrawal of donor budget support placed the Government's fiscal accounts under enormous pressures. These pressures resulted in a substantial increase in the budget deficit, which reached a value equivalent to 8.6 percent of GDP in the 2013/14 fiscal year, compared to 1.3 percent in 2012/13. In turn, this resulted in a significant expansion in domestic public sector borrowing. During the same period, the Government also recorded substantial payment arrears, with the value of these arrears estimated at MWK 158 billion (then equivalent to USD 400 million, or 7.9 percent of GDP). In addition, a number of factors, including a persistently high rate of inflation; high interest rates; a large structural current account deficit; and pressure on the local currency, all contributed to a decline in the private sector's level of confidence.

An estimated 89,000 hectares of cropland was destroyed by the floods in early 2015, representing around 2.4 percent of total agricultural land in Malawi. Estimates from the Post-Disaster Needs Assessment put the total value of damage and losses, including those to agricultural crops, housing, commerce and public infrastructure at around USD 324 million (equivalent to 5.0 percent of GDP)

2.5 Energy financing

2.5.1 Potential International Finance Capital

Credits from the International Development Association (IDA) have been the main source of funding employed by the World Bank. The International Finance Corporation (IFC) lends to the private sector and organizes loan syndications that give international banks confidence to invest in developing countries in various ventures including power. It also lends to local financial institutions for on-lending for project investments. The Multilateral Investment Guarantee Agency (MIGA) promotes Foreign Direct Investment (FDI) in developing countries by insuring private investors against political risk.

According to the African Development Bank (AfDB) website, the bank unveiled plans for a new 'Africa50 Fund', a big and bold solution designed to help fill the funding gaps in Africa's transport, power, water and communications systems. The Africa50 Fund will raise USD 10 billion in equity (in phases over time to seed the fund) which will be leveraged 10 times to deliver $100 billion worth of infrastructure projects. The Africa50 Fund will establish two business lines:

1. Project Development, increasing the number of bankable infrastructure projects in Africa.

2. Project Finance, delivering the financial instruments required to attract additional infrastructure financing to the continent, including credit enhancement and other risk mitigation measures.

Potential barriers to scaling up international finance that could benefit the energy sector include the policy and regulatory environment as well as the need for financial sector reforms. For instance, the African Development Bank offers complementary instruments to loan products such as Partial Credit Guarantees (PCGs) and Partial Risk Guarantees (PRGs) which are intended to broaden the range of the Bank's instruments of intermediation on

behalf its borrowing member countries. Whilst other countries have made good use of this facility, Malawi has not made use of it as yet.

2.5.2 Carbon trading

Opportunities exist in the UNFCCC established Carbon Emission Trading scheme for developed countries with an emission reduction commitment or private companies within developed countries, to purchase credits from projects in developing countries under the Kyoto Protocol. The revenue is raised through the sale of carbon credits through the formal Clean Development Mechanism (CDM) and through voluntary markets (not regulated under the UNFCCC but used by the private sector to informally offset their carbon footprints). Malawi is eligible to engage in the Clean Development Mechanism, one of the Carbon Emission Trading initiatives under the Kyoto Protocol. However, low income countries like Malawi have made limited use of this carbon finance mechanism to mobilize capital for investment in energy projects. There are considerable obstacles for LDCs to avail themselves of access to carbon finance. According to the WEO 2011 (energy for all) there are high transaction costs under the CDM which are prohibitive for small projects. However the CDB Executive Board has taken steps to simplify the requirements for small scale projects and projects in less developed countries and it is expected that these steps will reduce the transaction costs. A number of countries in Sub-Saharan Africa and Asia are already benefiting from CDM through the introduction of advanced cook stoves and improved technologies for household lighting. In Malawi this is mainly through the voluntary carbon trading mechanism but it is on a small scale. There is considerable potential for Malawi to harness carbon finance.

2.6 Energy situation in Malawi

One of the challenges the country faces is being able to meet the energy needs of all the people and the various sectors in the country. Energy supply deficiencies are common and these result in interruptions to processes that require energy as an input. A prominent example is the national electrical energy system, which is accessible to less than 1% of the rural population and is unreliable (Gamula *et al*, 2013). Households account for 83% of all energy consumption, with Industry taking 12%, Transport taking 4% and the Service sector taking 1% (Gamula, *et al*, 2013). Apart from power blackouts, the most costly and damaging is the environmental impact associated with bio-mass consumption. Firewood is immensely important for household energy (providing 95% of the rural household energy supply and 55% for urban households) with charcoal providing around a third of urban household energy supply.

However official evidence suggests that forestry resources are degrading at a fast rate of –2.6% per Annum (Yaron et al). Forest degradation resulting from use of fuel wood (as firewood and charcoal) is a significant problem in the catchments surrounding Lilongwe, Blantyre, Limbe and Zomba. Continued reliance on firewood and charcoal in the light of forest degradation sabotages development as it only increases women's and girls' burden of sourcing these forms of energy, and therefore calls for urgent energy efficient solutions.

The GoM has embarked on quite a number of programs and projects to improve the standard of living for the rural masses. These investments should be able to eventually deliver an energy utilization switch. Even with such programs being carried out, less than 1% of the rural population has access to electricity and the country's average electricity access rate stands at a very low 9% compared to a Sub-Saharan Africa average of 25%.

The Integrated Household Survey of 2010/2011 reported that although paraffin is a rarely used source of cooking fuel in the country, the situation is different when it comes to lighting

because paraffin is the most common source of lighting fuel at 52%, followed by batteries (dry cells) at 27%, firewood and electricity (8% each) and candles and others (5% and 1% respectively). The proportion of female-headed households using paraffin as lighting fuel is higher than that of males at 57 and 50 percent respectively. The import of battery-powered lamps has also increased substantially since 2008, whereas kerosene lamp imports have reduced over the same period. This pattern is supported by a recent nationwide survey that shows torch ownership at 71%, compared with 31% in 2008 (see: BIF, Market analysis and Strategy, 2014).

However, the use of solar powered lighting gadgets such as the Pico Solar Products has increased significantly during the past 2 to 3 years. An estimated 200,000 PSP units have been sold in Malawi in the period 2012-15 (BIF and REIAMA, 2015).

The collection of sex disaggregated data as part of monitoring the reach and impact of energy interventions has been weak in energy planning and programming. Moving forward, if the energy sector's goal to achieve sustainable energy access to all is to be effectively monitored, sex disaggregated data (that includes diverse variables that capture the status of marginalised and vulnerable population groups) will help to reveal strengths and gaps in energy services and interventions, so that the country can be on track to achieve its energy related goals and objectives.

2.7 Development commitments and obligations

2.7.1 Vision 2020

In the Vision 2020, GoM committed itself to the following vision:

"By the Year 2020, Malawi, as a God-fearing nation, will be secure, democratically mature, environmentally sustainable, self-reliant with equal opportunities for active participation by all, having social services, vibrant cultural and religious values and a technologically driven middle-income country".

It is noted that as we get closer to the target year, while the vision remains relevant, it will not be achieved. For energy, the issues of environmental sustainability (in terms of biomass etc.) and self-reliance (in terms of the energy for all targets) as well as active participation by all (in terms of social and gender inclusiveness) remain significant challenges.

2.7.2 Malawi Growth and Development Strategy (MGDS) II

In this document with regard to climate change, natural resources and environment management, the Government committed to the following statement:

Natural resources form a principal source of social well-being and economic development in Malawi. However, these resources are under constant stress from climate change and unprecedented human, industrial and other developmental activities. To address this, Government will implement a number of strategies, including: developing adaptation and mitigation measures to climate change related impacts; improving coordination of environment and natural resource programmes; promoting bio-diversity conservation programs; promoting development and implementation of Clean Development Mechanism (CDM) projects; promoting projects on waste management and air pollution and other environmentally friendly technologies and practices; and developing, conserving and protecting forest plantations and natural woodlands.

Although not explicit, it is reasonable to interpret this as saying that the Government is committed to clean and renewable energies. This new policy has taken this into account.

In addition, MGDS II placed an unreserved obligation on all sectors to fully and systematically embrace gender responsive programming by developing sector specific gender analysis and mainstreaming tools; developing guidelines for gender responsive policy formulation and review; undertaking monitoring and evaluation of gender mainstreaming in all sectors; and training public and private sectors on gender analysis and mainstreaming strategies. Doing so would ensure that social and gender considerations do not disappear in sectoral programmes and sub-programmes, as has so far happened in the energy sector. It is evident that the energy sector has been largely been non-compliant with the gender related mandates under the MGDS II, as there has been an absence of gender specific actions or gender targets to support the implementation of the energy sector's strategies under the document.

Adopting a true mainstreaming approach in this revised NEP will ensure the visibility of social and gender considerations in each of the energy supply systems for different sources of energy. This will avoid the recurring of the problem of 'forgetting' to apply the policy's own social and gender commitments in most of the programmes just because gender commitments were relegated to their own part of the policy. This 'forgetfulness' was also clearly reflected in the gender blindness of energy cluster strategies under the two Malawi Growth and Development Strategies that have been applied between 2006 to date. Therefore, despite the call for the two policy documents for all sectors to mainstream gender, implementation of the energy cluster strategies (skewed towards the supply side of energy) failed to effectively respond to gender differentiated needs in energy. It would be retrogressive for the MGDS II successor to reflect the same gaps.

2.7.3 Economic Recovery Plan

One of the priority areas of the Government's Economic Recovery Plan of 2012 is energy. Cognizant of the fact that the country continued to face a number of challenges in the Energy Sector, including inadequate capacity to generate electricity and intermittent power supply, which were affecting economic activity in areas such as mining and manufacturing, Government made the following commitment:

Government will support investments in energy generation and supply in order to generate and distribute sufficient amounts of energy to meet national socio-economic demands. It will endeavour to, among other activities, do the following:

- ***i*** *Continue financing works on the Kapichira II project;*
- ***ii*** *Establish new hydroelectric power stations;*
- ***iii*** *Continue pursuing the Millennium Challenge Compact with a view to widening its scope;*
- ***iv*** *Manage the demand in the industry by encouraging economical usage of electricity, including usage of energy saver bulbs;*
- ***v*** *Encourage regional interconnectivity;*
- ***vi*** *Explore the feasibility of coal-fired generation of electricity;*
- ***vii*** *Enhance research in other sources of energy including wind and solar; and*
- ***viii*** *Promote Public Private Partnerships (PPP) in energy generation and distribution.*

These are very clear policy directions and commitments of the Government with regard to energy, and new policy has taken these into account.

As of now most of these have either been executed or are in progress, as follows:

- (i) has been executed.
- (ii) is ongoing with Feasibility Studies in progress.
- (iii) is ongoing, although I doubt if the scope can be widened. NB: Some of the originally proposed projects are being implemented under the ESSP.
- (iv) was done under the DfID-funded EELP, but ESCOM is now planning a new project using LEDs.
- (v) is in progress, with MOUs signed with Mozambique and Zambia and the Songwe joint project with Tanzania in the design stage.
- (vi0 is also in progress, with implementation of Kam'mwamba already confirmed by GoM and Project Pamodzi pending execution of the PPA TS.
- (vii) is also in progress, with a number of solar projects identified for implementation between now and 2025.
- (viii) is probably the only one that is yet to take off.

2.7.4 Constitution of the Republic of Malawi

Section 13 of the Constitution embodies principles of national policy and states as follows:

The State shall actively promote the welfare and development of the people of Malawi by progressively adopting and implementing policies and legislation aimed at achieving the following goals:

a. To obtain Gender Equality through:
    i full participation of women in all spheres of Malawian society on the basis of equal opportunities with men; and
    ii the implementation of the principles of non-discrimination and such other measures as may be required;
b. To manage the environment responsibly in order to:
    i prevent the degradation of the environment;
    ii provide a healthy living and working environment for the people of Malawi;
    iii accord full recognition to the rights of future generations by means of environmental protection and the sustainable development of natural resources; and
    iv conserve and enhance the biological diversity of Malawi.
c. To enhance the quality of life in rural communities and to recognize rural standards of living as a key indicator of the success of Government policies.

These statements enjoin Government to ensure gender inclusiveness and non-discrimination in all spheres of life including in issues of energy. Further, the Constitution obliges that women, children and persons with disabilities should particularly be given special consideration in the realization of the right to development (Section 30). Energy policy has

to be seen to be facilitating these principles and commitments through targeted interventions towards women, other marginalized, and vulnerable groups.

The constitutional commitments further enjoin Government to ensure responsible and sustainable utilisation of resources including energy for future generations. There is also special recognition of the life of rural communities whose standards of living shall be a measure of Government's success. These are very strong commitments of Government in the Constitution. Quality of life in rural areas can be improved if they have access to clean energy for cooking, lighting and other purposes. Energy plays a key role in the economic development of a country. The policy takes full cognizance of these commitments.

2.7.5 Gender Equality Act

The Gender Equality Act of 2013 is one statute that directs how sectors should take an active role in promoting gender equality, equal integration, influence, empowerment, dignity and opportunities for men and women in all functions of society. The application of the Act in the energy sector would facilitate the permeation of these standards in organizational structures, governance, internal transactions, dealings with contractors and within the whole supply chain, and in relations with clients or customers etc. And generally, its quota provision (requiring public service appointing/recruitment authorities to appoint not less than 40 percent and not more than 60 percent of either sex in any department)[2] is key to accelerating improvements in women's employment in the energy sector, currently very low. Additionally, the mandate for institutions to adopt sexual harassment policies under the Act is also relevant to the energy sector, especially since the International Labour Organization requires that this vice should be addressed as part of occupational health and safety standards.

2.7.6 Environment Management Act

Section 5 (1) of the Environment Management Act guarantees the right to a decent environment and states as follows: ***"Every person shall have the right to a clean and healthy environment."***

As seen in this section, a clean and healthy environment has been couched as a human right capable of being enforced under this Act. Duty bearers for this right are Government and other stakeholders. Most rural people rely on biomass for energy needs, but biomass is associated with a number of problems including health issues.

[2] Section 11

3.0 BROAD ENERGY POLICY VISION, GOAL AND OBJECTIVES

3.1 Policy Vision

A well developed and efficiently managed energy sector that promotes and supplies modern and sustainable energy services for driving the economic growth for the country and a high standard of living for all men and women in Malawi.

3.2 Policy Goal

The goal of the policy is access to affordable, reliable, sustainable, efficient and modern energy for all Malawians by 2030

3.3 Policy Objectives

1. **To strengthen the Electricity Supply Industry and make it more efficient and capable of providing an adequate, affordable and reliable electricity supply which will enable industrialization, rural transformation, sustainable economic development and wealth creation, as well as regional electricity trading.**

2. **To promote energy programming, budgeting and monitoring that routinely addresses social and gender drivers for energy poverty and existing inequalities in the participation of men and women in energy programmes and services at all levels.**

3. **To promote use of environmentally benign energy technologies across the energy sector with a view to ensuring that all energy development programmes do not unduly compromise the environment, health and safety.**

4. **To ensure the country has adequate supplies and stock of liquid fuels at all times with at affordable prices.**

5. **To ensure availability of LPG in sufficient quantities at affordable prices for industrial and domestic purposes and enable a lot of households and institutions move away from biomass to LPG as fuel for cooking and other purposes.**

6. **To ensure biomass is sustainably used and carbon emissions are reduced through use of energy efficient technologies.**

7. **To create a robust coal supply industry that has broad private sector participation and that competes favourably with those in neighbouring countries.**

4.0 POLICY PRIORITY AREA: ELECTRICITY

4.1 Priority Area: Electricity Generation

4.1.1 Issues

Electricity generation in Malawi is characterised by inadequate generation capacity. Nearly 95% of Malawi's electricity supply is provided by hydropower from a cascaded group of interconnected hydroelectric power plants located on the middle part of Shire River and a mini hydropower station on the Wovwe River, which constitute the interconnected system. Total installed capacity of these hydropower plants is 349.85MW. The diesel generator at Mzuzu is rated at 1.10MW, while Likoma District has two separate isolated systems with a total installed diesel-fuelled power plant capacity of 1.05MW. ESCOM's total installed capacity, inclusive of the thermal plants, is therefore currently about 352.00 MW.

With only 352 MW of installed generation capacity against a demand of over 700MW at present, there is a gap that needs to be met urgently if the goal of sustainable energy for all is to be met. ESCOM, which is a vertically integrated utility, owns all the generating stations. There are no IPPs in the generation industry that can assist to fill this gap mainly due to unfavourable legal framework that act as a barrier to entry of IPPs into the industry. With revised legislation that will attract more private players to the industry, IPP and PPP generation projects offer the quickest way to augment ESCOM's efforts towards meeting the current and future demands.

Electricity generation is also characterised by overdependence on the Shire River as the main source for power generation as shown above. Overdependence on hydropower poses the serious risk of catastrophic reduction or even loss of energy in times of drought. Overdependence on one river is even worse.

Malawi's electricity grid is currently not interconnected with those of neighbouring countries, and Malawi is thus not able to either take advantage of importation of power from Mozambique, Zambia or Tanzania under SAPP or EAPP trading arrangements or to supply power to these countries when excess capacity is available.

There are several exiting challenges related to how power generation has so far integrated social and gender considerations. Where energy generation has involved construction activities, social and gender impacts have rarely been thoroughly and prominently analysed and addressed before a project and throughout implementation. Focus has mainly been on environmental impact assessments (EIAs) and not necessarily social impact assessments (ESIAs) that have a high content of information on how subgroups of men and women in project affected communities are likely to be positively or negatively impacted by the construction activity. The major gap has been the lack of gender expertise in EIA/ESIA teams. Without adopting a social and gender perspective to the procurement of construction works, there is always a high probability that men will reap most of the benefits of electricity investments, while women will shoulder most of the negative consequences.

Table 1: ESCOM's existing generation system

Power Station	No. of Units	Installed Capacity	Year Commissioned
Nkula Falls A (Shire River)	3	8MW each (24MW)	1966
Nkula Falls B (Shire River)	3	20MW each (60MW)	1980
	1	20MW	1986
	1	20MW	1992
Tedzani Falls I (Shire River)	2	10MW each (20MW)	1973
Tedzani Falls II (Shire River)	2	10MW each (20MW)	1977
Tedzani Falls III (Shire River)	2	26.35MW each (52.70MW)	1996
Wovwe Mini Hydro (Wovwe River)	3	1.45MW each (4.35MW)	1995
Kapichira Falls Phase I (Shire River)	2	32.4MW each (64.80MW)	2000
Kapichira Falls Phase II (Shire River)	2	32.4MW each (64.80MW)	2013
Mzuzu Diesel	1	About 1.1MW	1980
Likoma Island Diesels	3	250kW each (750kW)	2003
Chizumulu Island Diesels	2	150kW each (300kW)	2003
Total Installed Capacity in 2015		351.8MW	

Source: http://www.escom.mw/generation.php

And even beyond construction activities, most contracting agencies and contractors in generation have undermined the relevance of social and gender considerations in procurement. As a result, contrary to national laws and policies, measures to combat sex discrimination, sexual harassment, trafficking in persons, child labour and to prevent and mitigate HIV and AIDS have not been integral to the operations of contractors. The mandate to address these issues also applies to power generation companies themselves. So far, it is commendable that ESCOM's Integrated Strategic Plan (2013 -2018) has social and gender strategies aimed at improving the employment of women in technical positions (in 2014, only 2% of engineers in generation were women); and addressing issues of disability and HIV. However, without 'social and gender integration action plans' and commitment of adequate financial and human resources to aid the timely delivery of social and gender results, good paper strategies remain not good enough. Broadly, social and gender integration plans are critical to ensure meaningful gender and social inclusion in recruitment, procurement, management, governance and operations, including the generation of sex disaggregated data.

4.1.2 Objectives

1. **Expedite expansion of generating capacity through increased private sector participation.**

2. **Harness other potential sources of power generation, including thermal and renewable resources and, for hydro power, explore other rivers to reduce overdependence on the Shire River.**

3. **Enact relevant enabling legislation and implement and adhere to the legal framework for improved ESI governance and for attracting IPPs in generation.**

4. **Ensure Malawi's power system is interconnected with SAPP and EAPP grids.**

5. **Strengthen and modernise power generation through routine social and gender integration in the whole power generation value chain.**

4.1.3 Policy Statements

GoM shall put in place mechanisms for rapid development of new generation stations in order to meet the demand for power in the country. This shall include generation stations developed by ESCOM, those by IPPs and some under PPP arrangements.

For security of supply, generation sources shall be diversified. For hydro, other rivers and sources shall be given priority instead of relying on the Shire River.

GoM shall also promote other sources of generation of power including but not limited to mini hydros, geothermal, solar, biogas, coal, wind, bagasse-cogeneration, nuclear, and other sources. IPPs and social enterprises shall be encouraged to venture into these power sources, and to do so in a way that positively affects social and gender equality — from Feasibility Studies and Environmental and Social Impact Assessments (ESIAs) through all stages of the power generation value chain, including through the development of social and gender integration plans.

GoM shall ensure that power generation companies and contractors adopt all necessary measures to address sex discrimination, sexual harassment and any other relevant provisions that promote equal opportunities under the Gender Equality Act No. 3 of 2013

Generation from coal shall be promoted but only where the technology used ensures carbon and other harmful emissions are less than 20 %.

Malawi shall ensure it interconnects its power system with the SAPP and the EAPP grids without delay to take advantage of the power trading opportunities available in these power pools.

Malawi shall enact relevant legislation to ensure the unbundling of ESCOM and attract private sector participation in generation to increase generation capacity to meet the country's power needs.

GoM shall promote the resource mapping, exploration and development of geothermal power generation sources.

4.2 Priority Area: Electricity Transmission

4.2.1 Issues

ESCOM currently owns, operates and maintains the national electricity transmission grid, which comprises power transmission lines and grid substations operated at, currently, two voltage levels, namely 66kV and 132kV. The transmission power lines are on either wood or steel structures. The System Operations Department, which runs the National Control Centre, is one of the departments of ESCOM Transmission Division.

ESCOM's power system is currently isolated from those of the neighbouring countries, except for cross-border supplies (through the distribution system) to small border towns in Mozambique and Zambia. The transmission system has a total route length of 2,395km, of which 1121km and 1274km are operated at 66kV and 132kV respectively. 60% of 66kV lines are on wood structures, while the remaining 40% are on steel structures. The corresponding proportion for 132kV lines is 58%:42%. Commissioning dates for these lines range from 1966 to 2013, and the average age is around 30 years. These transmission lines transmit power in bulk to feed Distribution networks through over 70 grid transformers located at 39 grid substations across the country. The total transformer capacities with voltages of 132kV and 66kV are 390.5 MVA and 355 MVA respectively.

There are some capacity constraints in ESCOM's power system. Transmission line overloads have for some time now been evident in the system, especially in the Northern Region, where highest voltage in use is currently 66kV, with a weak 33kV link between Telegraph Hill and Bwengu Substations that is used as both a primary distribution and a low capacity sub-transmission line. Some transmission lines in the Southern and Central Regions are also heavily loaded and cannot transfer the additional capacity available from the new power stations and the imminent interconnections with Mozambique and Zambia. Power transformers at several grid substations are also heavily loaded. These bottlenecks have often forced ESCOM to implement load shedding in order to maintain acceptable voltages in remote parts of the system.

Projects being implemented under the MCC-Malawi Compact and other financing arrangements will militate against these transmission challenges. The MCC-funded Malawi Compact has the following transmission system strengthening components that are aimed at partially addressing these transmission bottlenecks:

- Phombeya – Nkhoma 400kV Line
- Chintheche – Mzuzu Upgrade to 132kV and Extension to Bwengu
- Additional Grid Transformer Capacity

Construction of a 400kV line from a new grid substation at Phombeya (the landing point of the 400kV interconnector with the Mozambican grid) in the Southern Region district of Balaka to another new substation near Nkhoma in Lilongwe (which will also be the landing point for the interconnection with Zambia's grid), will increase the power transfer capability of the system from the southern sources to the Central and Northern Regions.

The MCC-Malawi Compact is also upgrading the 66kV line from Chintheche Substation to Mzuzu to 132kV, with an extension thereof from a new substation at Luwinga in Mzuzu to another new substation at Bwengu near Rumphi Town. This will increase the power transfer capability to the North from the southern part of the grid via Chintheche, as well as facilitate connection to the grid of new generating stations to be constructed in the Northern Region.

Installation of additional or larger grid transformers at several substations throughout the system, which will increase the power transfer capability from the transmission grid to the distribution networks radiating from these grid substations, is also being done under the MCC-Malawi Compact.

Other planned transmission line projects include the following:

- Extension of the 400kV Backbone Transmission Line from the new Lilongwe Substation to the border with Tanzania on the Songwe River in Karonga District.
- The Eastern Transmission Corridor (tentatively at 330kV) to originate at Nkhoma and run along the lakeshore to the North.

- Regional Interconnections through Mozambique, Zambia and Tanzania.

Once constructed, these lines will facilitate internal power transfers as well as imports from and exports to the SAPP and EAPP grids through Malawi's three neighbours, Mozambique, Zambia and Tanzania.

The increased transmission system capacity is also crucial for evacuation of power from the generation stations, whether operated by ESCOM, IPPs or PPPs. The coming in of IPPs will also require that there should be a robust regulatory regime to ensure open access to the transmission system in a non-discriminatory manner. Hence the unbundling of ESCOM generation from Transmission and Distribution is the necessary condition for ensuring this open and non-discriminatory access to the transmission system so that both ESCOM- and IPP-operated generation plants should have access thereto in a properly regulated manner under a robust Grid Code. The Transmission and Distribution Company (TDC) to be created when ESCOM is unbundled will be responsible for transmission ownership, operation and maintenance of the lines. It will also be responsible for purchase of power from the generation companies and distribution thereof to large customers through the transmission system, or through the distribution system to other customers. Hence the TDC shall be the Single Buyer of power and the System and Market Operator.

Since transmission projects can disturb the way of life of local communities, especially through right of ways (ROWs), social and gender considerations come into play. First, feasibility studies and/or environmental and social assessments have to generate thorough data on how subgroups of men and women in project affected communities are likely to be positively or negatively impacted by the transmission project. This means gender expertise in feasibility and EIA/ESIA teams should be requisite.

The management of the MCC-Malawi Compact Transmission Projects offer the valuable lessons, namely: that a special social and gender integration team should be in place to support all areas of a transmission project; following ESIAs, environmental and social management plans should be developed in earnest in order to minimize negative gender specific impacts and increase positive ones; where communities are to be resettled and/or compensated, resettlement action plans should factor in women's voices independently of that of men and safeguard their interests when it comes to compensation; compensation should be given with the view to leave the project affected persons better off; financial literacy training should be provided to compensation recipients before monetary disbursements; constant monitoring of project affected communities and the gendered impacts of compensation/resettlement is necessary so that negative impacts can be quickly arrested.

Additionally, it is important for transmission companies (including IPPs) to facilitate the strengthening of ESI by ensuring social and gender equality considerations permeate issues of management, governance recruitment, procurement, and operations. For example, gender targets and results should be monitored through gender disaggregated data, just as there must be strategies for addressing sex discrimination, sexual harassment, HIV (even human trafficking, child labour and gender based violence, where applicable); and strategies for ensuring the availability of resources for social and gender inclusion interventions, as well as for relevant capacity building.

4.2.2 Objectives

1. **To enable the ESI to provide an adequate, affordable and reliable power supply which will assist in industrialisation, rural transformation, sustainable economic development, inclusive growth and creation of wealth (poverty reduction).**

2. **To modernise and strengthen the ESI through routine social and gender integration in all aspects of power generation, transmission and distribution**

3. **To restructure the ESI to ensure that the private sector can confidently participate in generation knowing they will have access to the transmission system under a robust Grid Code.**

4. **To expedite the ESI's effective participation in the emerging regional electricity trading markets through the SAPP and EAPP grids**

4.2.3 Policy Statements

GoM shall constitute ESCOM Transmission and Distribution Company as a separate legal entity from ESCOM Generation company. The TDC shall own all transmission lines and shall in the foreseeable future perform the following functions:

a. It shall own, operate and maintain transmission lines

b. It shall be the Single Buyer of power such that all generation companies shall sell all their power to it and it shall sell the power to large customers or sell power to customers through the Distribution division.

c. It shall do power trading, including being the sole importer and exporter of power.

d. It shall do system planning including determining the generation and transmission expansion projects timing, and generally electricity demand forecasting.

e. It shall manage the tendering and award of new generation stations whether under IPP system or PPP arrangements in liaison with other competent authorities

GoM shall put in place robust market operation rules including a Grid Code to ensure a level playing field in power sales and access to transmission lines by all generation companies, including IPPs.

GoM shall expand the capacity of the transmission system and ensure its reliability to ensure power can be transported from generation plants to customers, as well as for import and export.

Generation companies shall be allowed to build and transfer transmission lines to interconnect the power stations with the transmission grid.

Apart from the general duty to promote Social and Gender Inclusion in all areas of transmission, transmission works shall be accompanied by Resettlement Action Plans that pursue resettlement and compensation options with the lowest risk to project affected persons; and that have clear indicators to ensure that all gender perspectives are obtained and their interests are factored into all aspects of resettlement/compensation planning, implementation and monitoring.

GoM shall promote the development of social and gender integration plans by transmission companies, including IPPs, to facilitate solid gender and social integration in management, governance, recruitment, procurement, and operations, including the compilation of sex disaggregated data. All measures shall be taken to address sex discrimination, sexual harassment and any other relevant provisions that promote equal opportunities under the

Gender Equality Act No. 3 of 2013.

GoM shall promote interconnections with neighbouring countries, namely Mozambique, Zambia and Tanzania, in order to take advantage of opportunities for power trading in the Southern African and Eastern African Power Pools to supplement power in Malawi when there is a shortage and to sell power when there is surplus capacity.

The TDC shall be the only licensee licensed to import and export power into and out of Malawi respectively.

GoM shall review legislation to provide the legal framework for the new functions of the TDC which are Single Buyer, System Operator, and Market Operator.

Prices for purchase of power from generators shall be negotiated under prescribed guidelines, and MERA shall approve the final prices negotiated.

4.3 Priority Area: Distribution

4.3.1 Issues

This Distribution is responsible for distribution of electricity throughout the country. ESCOM's primary distribution system is operated at 33kV and 11kV, and these voltages are stepped down using distribution transformers to 400/230Volts for secondary distribution.

Currently, ESCOM supplies electricity to over 250,000 customers categorized as domestic, general, commercial and industrial. For domestic customers, sex disaggregation data is unavailable, despite that this information is useful both for improving access to electricity 'to all' and the 'bottom line.' The current number of customers translates into 9.0 percent of the national population having access rate to electricity. The Distribution Directorate is also responsible for the operation and maintenance of all the medium and low voltage lines, transformers and associated switchgear.

GoM had under the 2003 energy policy intended that the ESI would provide an adequate, affordable and reliable power supply which would assist in industrialisation, rural transformation, sustainable economic development and reducing poverty. It was hoped to increase the number of people with access to electricity from 4% to 10% of the population by 2010, 30% by 2020, and 40% by 2050.

The Integrated Household Survey of 2012 showed that by 2010/2011 about 8% of households were using electricity for lighting and only 2.5% were using electricity for cooking. This therefore means access to electricity still remains a major challenge in Malawi, which needs urgent attention. One barrier to and utilization of electricity for cooking by electrified low-income households is the high cost of electrical appliances. Although many cooking appliances sourced within the SADC have been exempted from taxes, those from South Africa is not tax-exempted, and VAT is still applicable to all appliances.

Another barrier is the high cost of connection to the grid including cost of transformers. Further currently ESCOM has a considerable number of applications for connection of power, but it is failing to connect for various reasons including material procurement bottlenecks and limited capacity to construct the lines to customers. High service connection costs, as well as tariffs that are unaffordable to poor households, are extra barriers.

For power distribution to contribute to solid inclusive development, it is also important that Distribution companies should be committed to strengthen social and gender integration in governance, management, recruitment, procurement, and operations -including in their customer services. The need for gender disaggregated data is particularly crucial in distribution services. Further, the nature of services warrant the presence of strategies for meaningfully addressing issues of sex discrimination, sexual harassment and HIV in relation to both staff and customers.

4.3.2 Objectives

1. **To increase the number of households with access to electricity from 10% to 25% of the population by 2035 and ensure that access is expanded for both male and female headed households;**

2. **To reduce factors that act as barriers to increased access to electricity in Malawi, such as high cost of capital equipment including transformers and high cost of household electrical equipment , and high cost of electricity connection for low income households**

3. **To incentivise the distribution licensees to be innovative and introduce specific measures aimed at increasing access to electricity.**

4. **To incentivise the population to use electricity when connected, in order to reduce dependence on biomass for cooking and water heating.**

5. **To improve the reliability and quality of electricity supply;**

6. **To improve performance of the distribution system by ensuring that customers are connected with speed and the power system is reliable.**

7. **To enable the ESI to provide an adequate, affordable and reliable power supply which will assist in industrialisation, rural transformation, sustainable economic development and wealth creation.**

8. **Bolster power distribution services through strong social and gender integration in programming.**

4.3.3 Policy Statements

For the foreseeable future, distribution shall be in public hands but may be concessioned out to a private operator or operators with the assets being publicly owned.

In order to save energy, GoM shall encourage and promote manufacture, importation and use of only energy saver bulbs and light emitting diodes (LEDs) and discourage importation and use of the inefficient high energy consumption incandescent bulbs.

In order to promote the shift away from biomass and other fossil fuels in homes, distribution licensees shall be enjoined/incentivized, subject to the tariffs provision below, to devise schemes that will:

a. Enable consumers to (i) connect electricity to their homes, and (ii) meet costs of basic electrical heating and cooking appliances through deferred payment terms or rental schemes where relevant costs shall be paid for with or through electricity bills over several years. Such a licensee may be given a loan from the Rural Electrification Fund

to assist it with front capital costs for these.

b. Introduce appropriate low cost technologies for female and male headed low income households.

c. Incorporate a strong communication strategy that especially ensures that rural female headed households and low income male and female households are reached with targeted promotional messages about relevant services.
d. Identify and address factors that hinder marginalized populations (e.g. people with disabilities, poor men and women, the elderly, etc.) from fully benefiting from electricity services.
e. Ensure that sex disaggregated customer profiles are compiled, and that user satisfaction surveys are regularly conducted as part of the electricity distribution function.

GoM shall promote the development of social and gender integration plans by distribution companies, to facilitate concrete gender and social integration in issues of management, governance, recruitment, procurement and operations. Special effort shall be made to address sex discrimination, sexual harassment and any other relevant provisions that promote equal opportunities under the Gender Equality Act No. 3 of 2013.

Tariffs shall be set at a level allowing the licensee to recover his costs and make a reasonable profit.

A lifeline tariff or a flat fee under prescribed safeguards and rules shall be put in place to enable poor male and female headed households to access electricity.

In order to reduce the high costs of basic electric appliances as a barrier towards access to electricity in low income electrified households, VAT subsidies or exemptions shall be promoted for basic cooking and heating appliances from within the SADC; and general tax reductions shall be promoted for otherwise non-exempted appliances from South Africa and beyond the SADC.

GoM shall promote the outsourcing of distribution line construction expertise in order to speed up customer connections.

GoM shall adopt the Global Tracking Framework (GTF) for measuring access to electricity, to ensure that electricity from all sources (including off-grid generation and PSPs) is taken into account.

GoM shall intensify the expansion and rehabilitation of the distribution network and make it more reliable capable of delivering quality electricity at affordable prices for industrial, commercial and domestic customers, including the rural populace.

4.4 Priority Area: Rural Electrification

4.4.1 The Issues

The Rural Electrification Fund has had some impact on electrification of rural areas but not a big impact. The transparency and accountability in the management of these funds needs to be enhanced and align with regional best practice in order to attract donors, the private sector and others to participate and contribute to this fund in order to accelerate rural electrification and increase access to electricity.

Rural electrification has also up to now targeted mainly grid extensions and renewable energy and mini grids have not been promoted significantly. Further, rural electrification has so far concentrated on electrifying selected trading or rural growth centres in the districts. Villages, especially households, grain mills, and social services facilities need to be reached in order to increase access to electricity as over 80% of the population of Malawi live in rural areas. This will dramatically improve the quality of life in rural areas, and avert consequences of energy poverty on rural women such as risks of violence and drudgery.

Rural electrification can be more inclusive by expanding the grid network and promoting renewable energy including min grids. Generally, rural electrification can improve its benefits to subgroups of rural men and women through deliberate action to incorporate relevant social and gender considerations in planning, governance, management, recruitment, procurement, and operations.

It is also noted that many rural public institutions are not connected to electricity the national grid, mini grids, or other renewable sources including solar installations. Most of the SDGs which the UN has just put in place can not be met without access to adequate and reliable electricity supplies in rural areas.

4.4.2 Objectives

1. **To ensure rural electrification reaches rural villages to increase access to electricity.**
2. **To restructure rural electrification governance by creating an autonomous Rural Electrification Agency to manage rural electrification activities and manage the Rural Electrification Fund.**
3. **To promote the use of solar and other renewable energy sources to accelerate rural electrification**
4. **To ensure all public schools, health facilities and police stations and offices are electrified speedily.**
5. **To promote robust social and gender integration in the rural electrification value chain.**

4.4.3 Policy Statements

The present Rural Electrification Committee shall be replaced by the Rural Electrification Agency as a semi-autonomous legal entity to manage rural electrification activities and the Rural Electrification Fund. Hence the functions of this entity will be similar to those of the Rural Electrification Management Committee under the present Act. This entity will also have a department managing renewable energy. The appointment of REA officers shall adhere to the 40:60 public service recruitment quota system under the Gender Equality Act No.3 of 2013.

GoM shall ensure that all aspects of rural electrification programming and monitoring supports the meaningful integration of social and gender considerations, and that measures shall be in place address sex discrimination, sexual harassment and any other relevant provisions that promote equal opportunities under the Gender Equality Act No. 3 of 2013.

In order to increase access to electricity to rural households, the GoM shall through the Rural Electrification Fund pay for the cost of a transformer where it is intended to serve a minimum prescribed number of domestic customers, whether on- or off-grid.

The GoM shall commit a percentage of grid electricity investments to off-grid interventions that target low-income rural households, especially in remote and hard to reach areas.

The Rural Electrification Fund shall be used to:

a) Provide low interest loans and/or other incentives for the promotion of rural electrification investments that introduce financial linkages or other relevant models (including support in developing business plans) for extending access to off-grid electricity by productive enterprises such as artisanal and small scale mining operations, grain mills, business cooperatives, agribusiness enterprises, irrigation schemes, skills building training centres, etc., especially in remote areas.
b) Finance rural electrification projects whether on- or off-grid irrespective of the type of energy source, and provide funding for private entities but only under concessions where the assets shall remain in public ownership. Considering their cost effectiveness, particular attention shall be paid to projects aimed at the extension of electrification to unconnected male- and female- headed households in already electrified communities (intensification).
c) Offer low interest end user loans for initial costs of grid and off-grid electrification. Female headed households, child headed and elderly headed households and households that have person(s) with disability shall automatically be eligible for support so long as their home is safe to electrify.
d) Support distribution licensees to cushion low income consumers' upfront costs of basic electrical heating and cooking appliances through deferred payment terms or rental schemes, where applicable costs shall be paid for with or through electricity bills over several years.
e) Provide subsidies targeting male- and female- headed households that would not have managed to access loans and connect to rural electricity in electrified areas after a determined period, most likely due to poverty, so long as their households are safe to electrify.

GoM shall ensure that all public primary and secondary schools, all public health facilities, and all police stations and offices are electrified by 2030.

GoM shall amend the Rural Electrification Act to create a Renewable Energy Agency as a semi-autonomous legal entity.

4.5 Priority Area: Renewable Energy

4.5.1 Issues

Malawi's Department of Energy has adopted the following definition of renewable energy: Renewable Energy Resources (RERs) are those resources of energy available to mankind arising from natural processes in the interaction between the sun and the earth's surface and regularly replenished. The sun is the primary renewable energy source. Secondary forms of RERs that derive from the sun are: wind energy, hydro power, ocean thermal, as solar heat in oceans which causes thermal gradients, ocean wave, which arises from interaction between wind, ocean and planetary motions, ocean tidal, which is caused by planetary motions effects on oceans, electricity from photovoltaic effects, biomass, which emanates from the process of photosynthesis and resultant production of organic plants, and geothermal, from the

earth's hot core (e.g. hot geysers or springs). Some of the resources that arise from oceanic interactions with the sun do not apply to Malawi because it is landlocked. .

In this policy, renewable energy covers solar (PV and thermal), wind, micro, mini and small hydro, biomass and geothermal heat. While all these can be used to generate electricity, some of them can be put to the following direct or energy conversion applications:

- Water heating using roof-mounted solar water heaters;
- Water pumping using windmills;
- Process steam generation using biomass;
- Cooking using biomass; and
- Production of biofuels from biomass.

NB: For biomass to be truly renewable, it must be utilised in a sustainable manner, which entails replanting of tees with focus on the fast growing varieties, and use of more efficient brick and charcoal kilns and cook stoves.

While all hydropower sources are renewable, large hydropower plants are for the purposes of this policy not categorised as such, because of their high contribution to the energy mix. Ordinarily when renewable energy sources are used to produce electricity, the electricity has to be regulated in the same way as that from non-renewable sources. One of the regulatory instruments for regulating electricity from renewable energy sources is the Feed-in Tariff policy. MERA has developed a Feed-in Tariffs policy, the objectives of which are as follows:

- Facilitate renewable energy resource mobilisation by providing investment security and market stability for investors in electricity generation from Renewable Energy Sources.

- Reduce transaction and administrative costs and delays by eliminating the conventional bidding processes.

- Encourage private investors to operate their power plants prudently and efficiently so as to maximise returns.

Some of the barriers to exploitation of renewable energy sources are:

- Inadequate human capacity building at all levels in RET products, services, installation and maintenance, and marketing;
- Lack of information or awareness among the population;
- Prohibitive capital costs of RET products, e.g. mini grid systems, solar PV systems and PSPs; and
- Lack of enforcement mechanisms for standards resulting in a proliferation of poor quality products, e.g. PSPs, on the market

There are a number of small solar photo-voltaic installations at some government institutions like hospitals as well as some solar house systems. The biggest in Malawi is currently the 850kW installation at Kamuzu International Airport in Lilongwe. However some of the Solar PV systems installed under the Rural Electrification Programme have run into problems and some are no longer functional for various reasons, including lack of capacity to carry out maintenance and failure to follow up by DoE.

Pico Solar Products (PSP) are products that use solar power charged batteries to provide lighting and power for mobile phone charging. An estimated 100,000 PSP units have been sold in Malawi in the period 2012-15 (BIF, 2014). These products provide electric lighting for

approximately 500,000 people, which is equivalent to 40% of ESCOM's customer base, currently estimated at 1.2 million people (Demographic and Health Survey, NSO).

Wide use of these products would avoid some of the following problems:

Improved Health and Safety: Kerosene and candles produce dirty and harmful fumes when burnt; inhaling the fumes from just one kerosene lamp is the toxic equivalent to smoking 40 cigarettes. The fumes can also cause eye infections and lead to longer-term problems with eyesight. Open flames also mean that there is a real and present danger for burns (particularly for children) and fires.

Improved Education: Reading and studying at night without an electric light is a difficult task; working by candle light strains the eyes, can be dangerous, and is also expensive. In Malawi, two-thirds of head teachers surveyed said that the performance of children who had access to solar lights had improved attendance, motivation and concentration in class.

Improved Maternal Health Services: Without lighting, many rural maternity services have had to be provided using candles or kerosene lamps for lighting. This compromises the quality of services and health.

Retention of Rural Social Services Providers: There is evidence that health and education personnel that live in electrified houses are willing to stay and work in rural areas, whereas staff turn over is high in sites that are not electrified.

Improved Accesses to Communications: Mobile phones are becoming intrinsic to social and economic interactions and have well documented benefits. But, the use of mobile phones and the benefits cannot be realised without charging facilities. Currently, charging services are very expensive for most rural men and women, since they have to access paid services at distant trading centres, or from those that have solar gad

According to UNESCO, in 2012 only 10% of primary schools and 52% of lower secondary schools in Malawi had access to electricity. Although there are no current statistics, electricity access rates for rural health facilities is thought to be equally low.

National regulation of pico solar products is governed by the Malawi Energy Regulatory Authority (MERA) and the Malawi Bureau of Standards (MBS). MERA issues licenses for the importation and selling, and installation and maintenance of solar products. MERA requires all licensed suppliers to employ a certified electrical engineer and offer consumers at least a one-year warranty. MBS is responsible for issuing import certificates for products adhering to a set of national standards.

Compliance with both MERA and MBS licenses and standards can be burdensome for PSP importers, adding costs to the retail price for consumers. MERA issues licenses for installers of RETs, but does not have the capacity to conduct inspections on installations or oversee the industry. A body that can properly oversee the industry and set standards for installers and installations is required.

Mini-grid operators have an inherent challenge in serving dispersed, poor customers with small scale systems that struggle for economies of scale. Legality of cost recovery tariffs is therefore welcomed; a higher rate than ESCOM is necessary to achieve operational sustainability. This is similar to the feed in tariff except that the mini-grid does not feed into the ESCOM system. It is an isolated system.

Mini-grid technologies, business models and customer service levels are significantly different from grid systems; bespoke regulations are therefore required to provide an enabling and appropriate regulatory environment. Specific areas for distinct regulation

include level of technical detail and environmental regulation in license application, power availability, tariffs, customer communications and regulatory reporting.

Social and gender considerations have to be at the centre of all RE interventions if access to modern renewable energy sources is to equally expand to both men and women of diverse socio-economic backgrounds; and if women and men are to be equal players in ORES. For the latter, currently women are lagging behind in RE related entrepreneurship, technical expertise and employment, amongst others.

4.5.2 Objectives

1. **To ensure the establishment of a vibrant, reliable, incentivized and sustainable private sector driven RET industry.**
2. **To ensure Malawi becomes a carbon neutral country by 2035.**
3. **To reduce the dependence on firewood and charcoal by increasing access to affordable and reliable alternative sources of energy such as electricity, biogas, liquefied petroleum gas (LPG), and solar water heating.**
4. **To reduce the cost of electricity from renewable energy and eventually achieve tariff parity with that from non-renewable sources.**
5. **To restructure the Renewable Energy industry to make it robust, and properly regulated and coordinated.**
6. **To foster the inclusion of Social and Gender dimensions in renewable energy planning, design, use, supply and provision of services.**
7. **To intensify assessment of renewable energy resources and harnessing thereof.**

4.5.3 Policy Statements

GoM shall ensure systematic and intensive education that targets different categories of end users, including low income male- and female- headed households, about the use and availability of Pico Solar Products (PSPs), Solar PV and RE generally.

GoM Shall endeavour to support efforts by communities or small scale entrepreneurs implementing mini/micro grids by among others making MERA to develop regulatory guidelines that befit such small scale generation

GoM shall enhance the involvement of communities in community energy planning and implementation

GoM shall promote, through incentives to private sector, the distribution of 2.5M PSP by 2030 in order to significantly contribute to the attainment of the goal of SE4ALL by 2030.

GoM shall intensify renewable energy resource assessment to trigger a change in the perception of decision makers in their knowledge base and awareness of the country's renewable potential and opportunities, thereby allowing them to make more informed

decisions.

GoM shall promote the use of hybrid power generation systems involving solar and other energy sources to manage the effects of the intermittent nature and availability of solar energy.

GoM shall promote geothermal electricity generation and evacuation. Studies exploring and mapping potential sites should be intensified

GoM shall install Solar PV systems in all public facilities in the off-grid areas e.g. schools, health units, Police units, etc. by 2035. For this purpose GoM shall integrate into mainstream energy planning support for high quality off-grid lighting and cooking technologies that can reach all social services and related facilities that will not be covered by the grid in the immediate to medium terms. Such facilities include boarding facilities for schools and secondary schools, rural teachers' houses, health workers' houses.

Government will encourage and promote stand-alone decentralised mini grids from renewable sources, through projects that are planned, implemented and managed by communities.

GoM shall develop strategies to monitor and increase the functionality rate of RET units in social services, as well as in male- compared to female- headed households.

GoM shall actively promote all private sector players in the RE to belong to a recognized industry association such as Renewable Energy Industries Association of Malawi;

GoM shall ensure that women's participation in all aspects of RETs programmes is improved through:

a) Developing programmes with targeted measures to support women's ownership of RETs companies/enterprises, equal participation of women and men in all aspects of RETs training programmes, and the implementation of performance incentives for male and female RETs service providers;

b) Promoting investments in women's economic empowerment programmes at community level, including as independent RETs technicians, women's involvement in constructing and marketing biogas digesters, selling/ installing solar home panels/systems etc;

c) Introducing and addressing vocational and tertiary courses to address capacity development needs in all areas of RETs. Relevant curricula shall incorporate gender mainstreaming modules;

d) Devising strategies to increase the participation of women in science and technology courses, especially with a view to encouraging them to enter into careers in all areas of the Renewable Energy Industry;

e) Supporting financing institutions to design loan products that can support RETs end users, with deliberate measures to ensure that women equally benefit;

f) Promoting employment opportunities for women and marginalized groups by giving incentives for RETs companies and entrepreneurs to train these as extension workers and trainers, installers, marketers etc.

GoM shall promote renewable energy tariffs and incentives to RE providers and manufacturers that provide warranties for their products, and maintenance support for their services, especially targeting low income social groups;

GoM shall set up a Renewable Energy Development Fund in order to support the acceleration of RE utilisation. The fund shall be used to promote the provision of effective and efficient services by the supply side, and to improve access to RETs by low income end users, through:

a) Acceleration of the utilisation of RETs in social services as prescribed above;

b) Promotion of women's participation in RETs as prescribed above.

c) Supporting upfront costs of commercial enterprises and public facilities that can sustainably produce their own biogas, for example from municipal and other waste.

d) Supporting initiatives aimed at enhancing the agricultural application of bio-slurry as a way of improving food security.

GoM shall promote competitive bidding for mini-grid concessions in order to achieve the best value for money, and ensure that the procurement process fully takes into account the need for licensees and their contractors to adhere to minimum gender equality and social inclusion standards, as prescribed above.

Bidders shall compete on the basis of smallest subsidy required for a given PPA tariff and specified minimum service levels.

GoM shall establish the Renewable Energy Agency, which can be a department in the proposed semi autonomous Rural Electrification Agency. The appointment/recruitment of officers to serve in the Renewable Energy Agency shall adhere to the 40:60 quota system and other relevant provisions under the Gender Equality Act No.3 of 2013.

GoM shall enact a Renewable Energy Act, with the main objective of establishing the framework for the accelerated development and advancement of renewable energy resources, and the development of a strategic program to increase inclusive renewable energy utilization

MERA shall regulate the RETs and MBS shall promulgate and enforce standards of RET products, especially Solar PV and Pico Solar products.

GoM shall build capacity of:

a. local private operators in the development of bankable off-grid project proposals as well as in accessing carbon financing;

b. local financial institutions in appraising renewable energy power projects, especially community or decentralised ones;

c. the MBS and MERA to support the development of renewable energy standards and certification schemes for installers;

d. rural communities in entrepreneurial and technical skills in RE technologies and enterprises, targeting the equal participation of men and women;

e. the DoE in renewable energy resource assessment;

f. the DoE and Renewable Energy Agency in developing, implementing, budgeting for, monitoring and evaluating all renewable energy interventions from a social and gender perspective and building strong capacity in collecting and analysing

sex disaggregated data;

g. training institutions (Universities, technical colleges including the newly launched community colleges) to train more male and female professionals, technicians and artisans in RE development (where applicable), installation and maintenance;

h. RE training institutions to deliver gender mainstreaming modules in their programmes in order to institutionalise gender responsive approaches to RE; and

i. Agricultural NGOs, extension workers to train low-income male- and female-headed households in the agricultural application of bio-slurry as a way of improving their food security.

The current 4.5 % levy on liquid fuels and electricity for rural electrification shall continue, but renewable energy shall take a good share (50-50 between grid extensions and renewable energy).

Financing institutions shall design loan products that can support access to different RE technologies by end users, especially women.

GoM and stakeholders shall actively pursue carbon financing both CDM and voluntary ones.

GoM shall build strong partnerships with the private sector, social enterprises and NGOs.

GoM shall dedicate a percentage of grid electricity investments to off-grid projects.

GoM shall incentivise the private sector to participate by providing fiscal incentives, such as VAT relief (zero rating) on equipment; continue duty exemption; and grant tax holidays, capital allowances and other incentives.

GoM shall encourage the private sector, social enterprises, development partners and NGOs to finance women economic empowerment programmes involving building women's capacity to own RE enterprises; constructing, marketing and maintaining biogas digesters; selling and installing solar PV system and PSP, etc.;

GoM shall, through promotion of local manufacturing of RET products, fiscal incentives and auction or tendering systems for RET products and services, achieve tariff parity between mini grid electricity and that from other sources by the year 2035.

5. POLICY PRIORITY AREA: BIOMASS

5.1 Issues

Biomass is organic matter that can be used to provide heat, make fuel and generate electricity. Wood-fuel, the largest source of biomass has been used to provide heat for thousands of years. Many other types of biomass, such as plant residue from agriculture or forestry and the organic component of municipal and industrial wastes, are also used as energy sources. Landfill gas is also considered a product of biomass.

Trees when standing are regarded as a forestry issue, but when cut down they are sources of energy as well as timber. Forestry is under the Forestry Department while energy is under the Department of Energy Affairs. While these two departments are currently in one Ministry (the Ministry of Natural Resources, Energy and Mining), they have not always been and there is no guarantee that they will always be in one Ministry. Notwithstanding the fact that they are in one Ministry they operate under different policies, namely the Energy Policy and the Forestry Policy. They are also governed by different laws, i.e. the Energy Laws and the Forestry Act.

Biomass is Malawi's main source of energy, mainly in the form of wood. In 2009, it accounted for an estimated 89% of the country's energy demand distributed as follows: 98% of household energy, 54% in the industrial sector, 27% in the service sector and 5% in the transport sector (see Malawi Biomass Energy Strategy Paper March 2009 p23). In this same report it is reported that total energy demand by fuel type was as follows: biomass 89%, petroleum 6%, electricity 3% and coal 2%. It is therefore a matter of concern that the 2003 NEP devoted over 90% of the policy to 9% of the energy demand by fuel type (i.e. 6% petroleum and 3% electricity) and a tiny fraction to the 89% of the energy demand by fuel type.

It is estimated that over 3 billion people globally and 700 million people in Africa rely on biomass fuel (wood, charcoal, straw, animal dung, crop residues) as their main source of domestic energy. Indoor air pollution from biomass fuel is increasingly recognised as a major health concern in the developing world; it ranks tenth among preventable risk factors contributing to the global burden of disease, and is responsible for an estimated 36% of mortality due to respiratory disease. (See Research paper on Wood smoke exposure, poverty and impaired lung function in Malawian adults by Liverpool Welcome Trust and others, 2010).

However improved cook stove technologies have been developed and are being developed or improved to: reduce wood usage (which also saves time and workload for women and girls); reduce carbon emissions (thus reducing exposure to smoke and resultant health impacts); promote other aspects of health through reducing the risk of snake and insect bites, severe fatigue, backache, and miscarriages; improve safety (there is no excessive heat and women's/girls' risk of rape or attacks during firewood hunting is minimised); and generally reduce environmental problems. For example studies comparing the three-stone fire,

Chitetezo mbaula and an improved Mbaula called Phillips stove have produced good results. Relative to the three stone fire the Chitetezo and Philips stoves decreased fuel use by 34% and 61% respectively. The Chitetezo and Philips stoves have also decreased CO and PM2.5 exposure by approximately 45% and 75%, respectively, relative to the three-stone fire. Furthermore the Chitetezo stove offers modest improvements in fuel use and emissions at a low price point. (See results of measurements done by Pam Jagger, UNC-CH Forest Use, Energy and Livelihoods Lab Carolina Population Centre CLIOMA, Lilongwe, Malawi, September 2014).

The Energy Status Report (2015) has demonstrated that in households where the improved cook stove technology is replacing the three stone open fire technology, another positive impact is the high level of satisfaction with efficiency of technology amongst users. Further, the Energy Status Report has observed that the reality of the high cost of rural and home electrification and acquisition of household electric appliances means that in the short to medium term, providing access to improved cook stoves could be the most realistic and affordable measure to reduce the energy caused burdens on poor female and single male headed households in general, and rural women in particular.

Despite the notable benefits of improved cook stoves in a country that will continue to heavily rely on biomass for cooking in the foreseeable future, the uptake of improved cook stoves remains low due to low scale projects, inadequate promotion of cook stoves to different groups of end users in both rural and (peri) urban areas, high purchase costs for low income households, lack of production and end user subsidies and credit facilities, and inadequate linkages between improved cook stoves and economic benefits/incentives to prompt end users discard the use of open fire cooking in areas where firewood is available.

Another fuel of relevance to energy is charcoal, which is the only other important biomass fuel used in urban areas. According to the Government of Malawi's Biomass Energy Strategy paper of 2009, charcoal has about twice the energy value of wood per unit of weight, is easier to control in a stove, can be extinguished and re-used, and imparts a desired flavour to some foods. In addition, it does not attract insects in storage or deteriorate as easily as firewood. It is a fuel for large towns and middle-income households. As the radius of a catchment area (CA) increases, the cross-over point between the cost of supplying firewood and charcoal is reached and charcoal then starts to compete with firewood as an everyday fuel.

Urban areas are the largest market for charcoal. Thus in Blantyre, Malawi's largest town, approximately half the households use charcoal and half use firewood, excluding those cooking with electricity. Lilongwe is the other large town and, between 1996 and 2008, the proportion of its households consuming charcoal increased from about 20% to over 40%. In the other towns, between 10% and 20% of households now use charcoal.

Non-household uses include restaurants, roadside meat roasting stands and blacksmiths. A little charcoal is used by rural households, some of which is self-collected or saved from wood fires. The only rural non-household uses of charcoal are for a little tobacco curing and by blacksmiths. The cement industry once tried charcoal on an experimental scale (at Viphya Plantation). Although this was technically feasible, the charcoal was not cost-competitive with other fuels.

As with firewood, charcoal production is an informal rural industry with an average workforce of just over two, 90% of whom are related to each other. It is mainly a full-time, year-round occupation and is more labour intensive than firewood production. Like firewood production, it can be horizontally and vertically integrated. However, a 2007 industry survey by Kambewa et al indicated that about one-third of charcoal was made by large-scale producers and that most small producers were organised by industry middlemen.

Charcoal is mainly produced using earth mounds, but the 2007 survey found that 16% of the producers used pit kilns and 1% used brick kilns. Pit kilns have to be used several times to be worth the effort of digging a pit and brick kilns are semi-permanent structures, thus there has to be a sustainable wood supply nearby. The latter two technologies have a higher efficiency than the earth mound, but there are cost-effective ways of improving earth kilns and average conversion efficiencies of about 23% (by weight) are typically reached by traditional charcoal producers in the region. This is much higher than the 10-12% recovery rate often quoted, but reliable studies based on empirical measurements confirm that

conversion rates of 20% wet weight and 25% dry weight are commonly achieved under realistic operating conditions, questioning the validity of the more pessimistic figures (see Biomass Energy Strategy paper).

These are satisfactory recovery rates and much higher than commonly quoted. They could probably be increased further, if charcoal producers were not evading the law and cutting corners, but were instead operating in an open and legitimate environment and within the law where they would have an incentive, for example, to dry the wood for longer before conversion or to modify traditional kilns with a simple metal cover and/or chimney (see biomass energy strategy paper).

The development of the capacity of local charcoal makers in building modern charcoal kilns is on the government's agenda, but work is at infant stage. The Ministry of Natural Resources, Energy and Mining is implementing the pre-feasibility study of modern kilns for charcoal production (under sustainable energy management project that is funded by UNDP) in Chidakwani village Neno. The aim of the project is to replicate the efficiency of modern kiln technologies that were done at Chikangawa in Mzimba district. At this stage, the kilns use natural trees, but exotic trees will be later introduced. Therefore, there is potential for the charcoal industry to be profitable as well as sustainable.

Women are currently not playing a prominent role, so developing deliberate strategies to ensure women's meaningful participation in the modern charcoal kilns technology is important, so that the intervention leads to their economic emancipation as well. More sustainable community and household level development can also be achieved by integrating broader socio-economic issues as part of the capacity building about the technology so that it facilitates positive development outcomes. This includes mainstreaming in interventions issues of child labour, joint control of assets and businesses (at household level), HIV, gender based violence etc.

The negative health issues associated with wood fuel for cooking are also applicable to charcoal, though it should be noted that charcoal usually emits less particulate matter but more toxic carbon monoxide than un-carbonised wood. According to the Global Burden of Diseases, Injuries, and Risk Factors Study of 2010, the leading health risk factor in Malawi is household air pollution from solid fuels which leads to respiratory infections, cancer, and other health problems.

What the above shows is that with improved technologies, households and charcoal makers will be able to use less wood than normal, thereby saving a lot of wood. It also shows that use of improved technologies will reduce carbon emissions and reduce incidents of diseases associated with use of fire wood and charcoal. Thus a combination of use of improved technologies, wide use of LPG for cooking and rural electrification as well as renewable PSPs can significantly reduce the amount of biomass consumed, which will result in saving forests and reduce incidents of diseases.

5.2 Objectives

1. **To make Malawi a carbon neutral country by 2035.**
2. **To reduce the biomass component in the energy mix to 40% by 2035.**
3. **To reduce the dependence on raw firewood and charcoal by increasing access to *charcoal briquettes* as an affordable and reliable alternative source of energy for cooking and heating.**

4. **To reduce the proportion of households using three-stone open cook stoves to 20% by 2035.**

5. **To ensure use of improved technologies to save energy in cook stoves, brick kilns and charcoal production.**

6. **To reduce dependence on biomass by incentivising the private sector's to use improved biomass combustion technologies, LPG and renewable energy technologies, through the provision of fiscal incentives, such as VAT relief (zero rating) on equipment, continuing with duty exemption, granting tax holidays, capital allowances as well as other incentives to accelerate use of green energy.**

7. **To design special energy programmes that include activities that will generate alternative incomes for households currently involved in firewood and charcoal vending.**

8. **To uphold the solid inclusion of social and gender considerations in all aspects of biomass programming.**

5.3 Policy Statements

Promotional activities for improved cook stoves, brick kilns, charcoal kilns, and other alternative energy technologies shall be carried out nationwide.

GoM shall incentivise the private sector, NGOs and other partners to distribute improved cook stoves to low income male and female households using a nationally coordinated distribution plan.

GoM shall create a Biomass Energy Agency under an Act – to be the lead agency in coordinating biomass energy activities, act as a link between downstream and upstream issues and coordinate with other Ministries such as Forestry, Water, Lands and Agriculture.

The appointment/recruitment of officers to serve in the Biomass Energy Agency shall adhere to the 40:60 quota and other relevant provisions under the Gender Equality Act No.3 of 2013.

GoM shall enact the Energy (Improved Biomass Cook Stoves) Regulations under the Energy Regulation Act. This can cover improved brick kilns as well as improved charcoal kilns. These Regulations shall apply to manufacturers, importers, distributors, technicians, and contractors of improved biomass cook stoves and kilns; and institutions using biomass fuels for cooking and heating purposes. Licensing and regulation to be done by the Energy Regulator.

Standards promulgated by MBS on cook stoves that are sold as commercial products on the market shall be enforced. All energy efficient cook stoves to be certified and labelled and marketed accordingly.

NGO community initiatives that build the capacity of rural men and women to make their own improved cook stoves using locally available materials shall be promoted, and a strategy shall be developed to ensure systematic coverage and standardized capacity amongst trainer of trainers to build high quality stoves.

GoM shall facilitate awareness campaigns to inform different categories of end-users about the standards, the label and the benefits from switching to more efficient equipment. For

commercial cook stoves on the market, the focus shall be on the label, which shall show that a particular piece of equipment indeed meets transparent minimum standards and can thus be expected to be energy efficient and save the user money.

GoM shall ensure priority funding for NGOs and industries in the production and distribution of high quality energy efficient cook stoves, accordingly certified where applicable.

The uptake of modern cook stoves and empowerment from biomass shall be increased through:

a) The reduction of the high cost (for the poor) of modern energy efficient cook stoves shall be facilitated (i) nationwide credit facilities to the end users. and (ii) linking access to improved cook stoves with social support measures for the poor (e.g. cash transfers).

b) Targeting promotion activities at women; semi-urban households as major purchasers of firewood; and males in male headed households as major decision makers on fuel sources.

c) Linking modern cook stove technologies to economic empowerment incentives/interventions.

d) Promoting district level carbon-trading programmes/investments whose proceeds can directly benefit communities and the needs of women and girls as an incentive for communities to faithfully conserve wood through use of energy efficient cook stoves and charcoal briquettes.

e) Organizing and economically empowering women and male and female youth in improved cook stove and charcoal briquettes entrepreneurship, including through cooperatives.

f) Promoting the equal training of male and female technicians in improved cook stoves and charcoal briquettes technologies.

Micro finance institutions shall be encouraged to develop well targeted financing schemes (credit or grants) for local groups that design or manufacture commercial cook stoves to support the development of cook stoves that meet certified standards.

Incentives shall be provided for the growth of industries and businesses that seek to empower low income groups, marginalised groups and vulnerable groups through the manufacturing and distribution of cook stoves and charcoal briquettes.

GoM shall promote the improvement of technology of charcoal production and utilization using the traditional kiln method through training of charcoal producers; encouraging adoption of other production techniques which are more efficient and cost effective; efficient and convenient stoves with less emissions; stove testing and certification; availing information on emission levels and efficiency of stoves; and facilitating participation of all stakeholders in stove development and dissemination.

GoM shall promote the growing of bamboos and other trees for making of charcoal to enhance sustainable charcoal production as well as providing income generating activities for men and women in rural areas.

GoM shall promote collaboration amongst Ministries, in the utilization of agro, forest and sawmill residues for combustion and gasification through growing of woodlots; and promoting biomass combustion and gasification technologies

GoM and stakeholders shall actively pursue carbon financing (both CDM and voluntary schemes) to finance improved cook stoves, brick kilns, charcoal kilns and charcoal briquettes

projects.

GoM shall build strong partnerships with private sector and NGOs (including PPPs) to finance projects in this field.

6. POLICY PRIORITY AREA: LIQUID FUELS AND BIOFUELS

6.1 Issues

Liquid fuel are fossil fuels which include gasoline (petrol), diesel and kerosene. Included in liquid fuels are liquefied petroleum gas (LPG), biodiesel and ethanol. However, for purposes of this section, we will discuss LPG as a separate priority area.

According to the 2003 Policy, oil and gas exploration, production and refining of crude oil, and production of ethanol constitute upstream liquid fuels activities while the importation, transportation supply, distribution or marketing of the LF products constitute, downstream activities. The policy contained generic provisions seeking to: empower Malawians and encourage their participation in the liquid fuels and gas supply industry retail outlets, and encourage greater private sector regulations. In addition, the policy sought to improve and strengthen liquid fuels and gas supply industries' governance structures and instruments. One shortfall was that there was no direction for the liquid fuels and gas supply industry to effectively facilitate inclusive growth by purposefully ensuring that both men and women are playing a visible role; and that players are incorporating social and gender considerations throughout their dealings.

6.1.1 Localisation of retail outlets and franchising

The Government of Malawi undertook that in the short to medium term its policy goal was to continue its reforms in the LF & GSI downstream market by restructuring the LF & GSI market through encouraging greater private sector participation and the localization of retail outlets.

The Policy stated that in order to expedite the implementation of the Government's retail outlet localization policy, own operation of retail outlets by any oil marketing company (hereafter referred to as OMC) should be restricted to a maximum of two filling stations.

As of end May 2015, Malawi had 170 fuel retail outlets[3]. Out of these, there are 62 Total retail outlets, 55 PUMA retail outlets, 25 Petroda retail outlets, 17 Engen retail outlets, 6 Injena retail outlets and 5 Energem retail outlets. According to the available information, some OMCs have completely franchised all their retail outlets whereas one or two still operate own retail outlets[4]. Based on information on the ground, there are generally 4 types of retail outlets operational arrangements which OMCs use for retail outlets operations, namely:

Company Owned Company Operated-COCO

This relates to fuel retail outlets which are owned by an OMC and which are also operated by the OMC itself. In terms of the Policy, it is this type of retail outlet which the OMC is limited to operation of only two.

Company Owned Dealer Operated-CODO

The CODO relates to retail outlets which are owned by the OMC but operated by an independent dealer. It is this type of operational arrangement that may correctly be termed a

[3] Based on information provided by the Malawi Energy Regulatory Authority (MERA)
[4] Information gathered from MERA and Retail Outlet Operators indicates that PUMA Energy, Injena, Engen, Energem have completely franchised the retail outlets whereas Total runs some retail outlets under the Young Dealers and Petroda seems not have franchised any of its retail outlets.

franchise. The OMC and the Dealer sign a Franchise Agreement which stipulates the rights and obligations that either party has in relation to the other. The majority of retail outlets currently fall under CODO.

Company Leased Dealer Operated- COLEDO

The COLEDO describes an arrangement whereby the OMC leases the premises where the retail outlet is constructed by an independent landlord but subsequently franchises the operation of the outlet to an independent dealer. In practice this works the same way as the CODO except that the OMC has to pay rent to the landlord[5].

Dealer Owned Dealer Operated-DODO

There are also instances where the retail outlet is owned and operated by the dealer[6]. In such cases the dealer enters into a Supply Agreement with the OMC which in like manner stipulates the terms and conditions of the dealership. Although this arrangement may be lumped together with the franchise arrangement, the practical realities on the ground show that the two are not the same.

Young Dealers

It must also be mentioned here that although this does not apply to the other OMCs, information gathered shows that over and above using the four operational options above, Total also has a Young Dealers operational arrangement. Under this arrangement, which operates similarly to the COCO, the OMC puts its retail outlet under the charge of the Young Dealer for an agreed period upon the successful completion of which, they enter into a Franchise Agreement like any other CODO. It says since the programme started in 2007, 13 Young Dealers have graduated and 2 have failed. The two failures were on the grounds of misconduct where the dealers misappropriated resources. All stations under the Young Dealer programme are licenced in the name of the Young Dealer, hence fully franchised.

The OMC concerned argues that the Young Dealer Program is a Youth Enterprise Empowerment Program dedicated exclusively to young (untrained) local Malawians in line with Government`s retail outlet localisation policy. Its objective is the creation and development of entrepreneurship skills through which the OMC is financing the working capital of the Young Dealers and exposing them to various forms of entrepreneurship and technical training thereby giving them an opportunity to become entrepreneurs. It also emphasises that this scheme exists in most countries where the OMC has a presence and is over 50 years old. The Retailers' Association however argues that this system is unfair as it leaves them with very little margin and that essentially the OMC has not franchised the filling stations as required by the policy.

It will be seen that there is need to standardise the franchising system in order to avoid these distortions. However, the OMC sees this is not advisable. It argues this is a wrong expectation because the OMCs have different business models. This OMC for example says they have franchised using a method that suits their business model which is geared towards promoting uniform international standards and best practices as guided by its head office.

With regard to fees that appear to be higher in some OMCs franchise the OMC concerned argues each class of station is charged differently to reflect the level of investment that has gone into it (particularly the capital expenditure and the operational expenditure). For this reason we cannot have all the stations charged in the same way.

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[5] Examples here include the Ntchisi PUMA Filling Station and Dedza PUMA Filling Station.
[6] Examples include Kanengo PUMA Filling Station, Costantini Total Filling Station and Mbowe PUMA Filling Station.

It argues other OMCs who do not bother about maintaining the minimum required health, environment and quality standards are happy to leave that burden to the dealer and charge them less, hence they appear to be cheaper but are in fact compromising on the same.

6.1.2 Strategies for reliable fuel supply

The Government also undertook to ensure continuous and reliable supply of liquid fuels in Malawi. Among other strategies for achieving this, the Government undertook to:

- Establish the National Oil Company of Malawi (NOCMA) with the mandate to leverage the entry into the LF&GSI/ Market of new players and to promote competition through its ownership of strategic fuel storage facilities.
- Encourage competition in liquid fuels and gas importations;
- Rationalize the location of internal commercial storage facilities and retail outlets; and
- Legislating for the regulation of the LF&GSI.

GoM established the NOCMA in 2010. Government of Malawi through NOCMA has constructed or rehabilitated liquid fuel storage tanks in Blantyre, Lilongwe and Mzuzu with a combined storage capacity of 60 million litres. The major outstanding issue here is the actual procurement and storage of the fuel.

The main point of contention however relates to granting of import licences to non-oil marketing companies. Granting of oil importation licences to companies that are not in the oil marketing business raises questions about the criteria that is applied to grant such licences. Oil marketing companies invest in infrastructure and should be the ones supplying those who require oil. Otherwise it is unfair to grant licences to those companies that have not invested in infrastructure. *c) Ethanol*

The other issue relates to ethanol. It is noted that the price of ethanol is marginally lower than that of petrol or diesel, yet ethanol is less efficient than petrol or diesel. Perhaps the only reason it is being promoted is because it is a renewable energy source. The other problem is reliability of supply of ethanol because of limited production capacity. It is noted that there is no reserve infrastructure and supply is straight into the tanks at pump stations. There are also no dedicated tanks at the pump stations for ethanol.

The Malawi Ethanol Programme, 2013 spearheaded by the National Commission for Science and Technology undertook to '**increase ethanol production and its use as fuel from the current 18 million litres per annum to 49 million litres and 104 million litres per annum by 2015 and 2020 respectively**'[7]. There is no evidence on the ground to show that Malawi has registered any increases in ethanol production. It is fair therefore to conclude that Malawi has not achieved this policy objective. However, PressCane and Ethco are now planning to invest in new plants that will produce ethanol directly from cane juice.

The NCST noted that estimated annual fuel requirements for petrol driven vehicles for the country would hit 198.6 million litres by the year 2015 and 320 million litres by the year 2020. At current blending ratios of 20:80 (ethanol/ petrol), this means that an estimated 37 million and 53 million litres of ethanol would be required to meet the demand for blending by 2015 and 2020 respectively. However the facts on the ground as at 2015 tell a different story. The table below gives the liquid fuel litres over the period (as supplied by MERA).

[7] Malawi Ethanol Programme (Maethol) : Roll Out Programme of Increased Ethanol Use as Vehicle Fuel, 2013

Table 2: Liquid fuels volumes (million liters) rounded off, and gas (kg)

Year	Petrol	Diesel	Paraffin	Jet-A1	LP Gas (Kg)	Ethanol
2008	103.004	199.245				
2009	106.376	198.394				
2010	110.098	207.343				
2011	80.533	120.453		11.580	**600,301**	
2012	43.124	89.192		7.526	**577,152**	
2013	108.856	188.742	1.952	10.043	**495,715**	12.941
2014	108.904	111.821	1.360	7.786	**567,669**	14.640
2015			0.104	3.915	**315,971**	6.188

Note: 2015 figures are from January to July.

Since the 2003 policy did not really address the subject of biofuels, as an emerging energy source, it is important to take into account the social and gender issues that are present in different aspects of the value chain, especially production, in order to develop an effective policy response that intersects with sectors such as agriculture. The involvement of local communities in the production of raw materials (feedstock) sometimes assumes that by taking a community as a single unit, both men and women will reaps the benefits of ethanol production within the country.

However, this ignores power dynamics relating to land access and control, which often weaken the position of women as 'automatic' beneficiaries of biofuel production. Therefore, generalized assumptions that "farmers" who are growing biofuel feedstock would reap financial benefits have to be avoided—because although women farmers may be seen to be in the frontline, the income may actually be controlled by men who are already making decisions over land, especially in marital unions.

Ensuring that women are part of the benefits would require purposeful action for biofuel projects to include this (the equal capacity of women to control proceeds) as a specific term of dealing with communities/households. Even organizing special cooperatives for women to grow feedstock can be strategic. It has also been noted that sometimes, the danger is that that where communities are encouraged to grow and sell biofuel feed stocks, men—as controllers of cash crops—may make a decision to dedicate most of the land to this purpose at the expense of food crops. Sometimes, men have even usurped the control of "women's gardens" (where women may have been given the leeway to grow food crops for household use and extra income), and devoted these to the growing of biofuel feedstock instead. It is therefore important for biofuel projects to have strategies for preventing such occurrences because when a family runs short of food, it is commonly women that bear the burden because of their cooking responsibilities.

Additionally, it is recognised that biofuels that are being produced from food crops such as maize can impact on the availability of food crops (and thus the price of food) within communities. While current programmes may not be using food crops for ethanol production, it is still important for energy policy to take into consideration this risk considering the likelihood that the ethanol market could grow over the next 20 years.

And at a general level, one of the excitements about investments in biofuels come with the prospects of local employment opportunities. However, in many communities where formal employment is viewed as a preserve for men, women may not be natural beneficiaries. Women may also face employment challenges due to their reduced access to education, thereby preventing them from being considered for skilled jobs by investors.

The purposeful adoption of recruitment strategies to build capacities and skills of local women in targeted jobs, as well as in the supply chain, can ensure that women's empowerment is equally being promoted in the biofuels market. Lastly, another risk that needs to be avoided is the loss of land by poor small scale farmers to large scale investors who may be sold large tracts of land for the production of biofuels.

6.1.3 Fuel importation system

Regarding the system of importation of fuels, GoM argues that for national security purposes Government must do the importation of fuels. OMCs have expressed concerns over this policy shift particularly because in the past similar arrangements were riddled with political interference, low capacity and corruption. It must further be noted that the proposed policy change has come about following a comparative study tour which the Government and PIL undertook jointly in Zambia and Tanzania. The OMCs have vehemently argued that this shift in policy was not in line with the Act which requires the Minister to publish the new policy and solicit views and comments from stakeholders which was not done.

The arguments for and against this policy shift seem to be evenly balanced. It is important however, to note that primarily, Malawi needs to adopt an importation policy which guarantees the following market needs:

- Buy fuel at the lowest premiums possible;
- Ensure continuous and reliable supply; and
- Transfer lower fuel prices benefit to the consumers.

On fuel pricing GoM few years ago adopted the automatic fuel adjustment formula which takes into account the international price of oil, the premium for bringing the fuel into Malawi, the exchange rate of Malawi Kwacha against the Dollar and local levies. MERA meets every month to look at these parameters and confirm the ruling price. Some of the levies are: rural electrification levy, fuel price stabilisation levy, road levy, maize / drought levy, MBS Cess. The Minster can by Gazette Notice amend this list. The biggest concern by stakeholders has been lack of transparency in the management and application of these levies.

6.2 Objectives

1. **To ensure the country has adequate supplies and stocks of liquid fuels at all times with a minimum stock holding of 90 days.**

2. **To ensure sufficient ethanol at affordable prices is available to meet blending and non-blending requirements at all times.**

3. **To ensure full liberalisation of the liquid fuels market subject to licensing requirements and national security mandates.**

4. **To strengthen social and gender dimensions of all aspects of the liquid fuels industry, and ensure both male and female indigenous Malawians are empowered to participate fully in the industry's operations, including the ownership, franchising and operation of retail outlets.**

6.3 Policy Statements

NOCMA shall continue as an institution responsible for holding strategic fuel reserves to ensure the country has adequate fuels at all times. It shall also participate in the oil industry to foster competition through participating in tendering for fuel importation with other licensees and selling of fuel to Oil Marketing Companies and retailers who have independent retail outlets.

MERA shall continue as a regulator for the Liquid Fuels and Gas Industry dealing with issues of competition, safety, licensing, pricing, importation, transportation, storage and other regulatory issues including collecting and disbursing fuel levies in a transparent manner.

GoM shall promote and encourage the private sector to take a leading role in the Liquid Fuels and Gas Industry subject only to licensing requirements and national security mandates.

The oil market shall be restructured as follows:

a. That importation of fuels shall be done through annual transparent tenders floated by DoE with any company licensed to import liquid fuels being able to participate in such tenders. For avoidance of doubt DoE shall not do the importation but will be floating tenders for licensees to tender for importation of liquid fuels. Again for avoidance of doubt NOCMA or PIL in addition to Oil Marketing Companies may participate in the tenders in which only one or a maximum of two shall be given the contract to import liquid fuels for the country for one year until the next tendering. All licensees including NOCMA shall purchase their liquid fuels requirements from the winning tenderer or tenderers.

b. That OMCs, Importer of liquid fuels and NOCMA shall be entitled to operate up to two retail fuel outlets only. The rest may be franchised out or sold to independent Malawian retail operators and owners respectively; provided that no OMC shall be forced to sell any outlet infrastructure.

c. In addition, retailers who are not under franchise shall be at liberty to purchase liquid fuels from any OMC, or licensee or NOCMA.

d. To ensure fairness and standardisation in the franchising system, MERA shall prescribe guidelines for franchising of liquid fuel outlets to be adhered to by all OMCs.

e. In order to foster competition, OMCs and liquid fuels retailers shall be allowed to sell liquid fuels at less than the approved prices.

The automatic price adjustment formula shall be maintained as it ensures OMCs recover their cost for sustainability and integrity of the industry.

NOCMA shall ensure it maintains a minimum stockholding of 60 days of the national consumption requirement.

Each OMC shall hold stock equivalent to 15 days of its normal sales. For this purpose every OMC must have sufficient stock holding capacity including capacity hosted by another OMC under contract. The price of fuel shall take into account this stock holding requirement.

Regulatory aspects of the liquid fuels supply industry shall also be strengthened to ensure that the industry is facilitating inclusive growth, including by:

a) Ensuring the development and targeted dissemination of licensing procedures that ensure access to information by potential women in business; and that empower women to be equally involved in managing, franchising, and owning of liquid fuel retail outlets

b) As part of the procurement process, requiring licensees to demonstrate a plan for the meaningful involvement of women and people with disabilities in shareholding, board, management and operational positions.

c) Ensuring that contracts with licensees stipulate the need to adhere to minimum standards such as equal pay for equal work, equal opportunities in employment and training, no discrimination based on sex, the need to develop sexual harassment policies, etc.

d) With regards to the latter, the intention should be to ensure that issues of safety of consumers and/or staff are also addressed from the perspective of sexual harassment as a recognized safety hazard in the work place, and that measures instituted are compliant with the Gender Equality Act No. 3 of 2013.

e) Ensuring that sex disaggregated data is a routine part of monitoring and evaluation of liquid fuels inspection systems in order to track the integration of social and gender considerations in operational and governance areas.

GoM, through fiscal and other incentives such as financial support, shall encourage and promote the production of ethanol and encourage use of various non-food raw materials in the production of ethanol.

GoM shall support the production or importation of raw materials for the production of high quality ethanol

GoM shall encourage, empower and promote communities to venture into production of non-food raw materials for ethanol production. For this purpose GoM must carry out research in such raw materials.

GoM shall promote the strengthening of social and gender dimensions of all aspects of biofuel programmes and projects, including through:

a. Reinforcing the adequate inclusion of women and marginalized groups in biofuel activities, and as well as their participation in decision making processes in projects.

b. Ensuring that food security is not threatened by biofuels by promoting the use of non-food crop feedstock for biofuel production and by instituting measures to ensure that out-grower or other schemes do not unreasonably encourage the use of agricultural land for biofuel feedstock at the expense of food crops.

c. Safeguarding land rights of small-scale farmers so that biofuel investments do not result in direct or indirect land grabs.

d. Promoting the development of biofuel processing plants that will provide equal employment opportunities for men and women, including those from local communities.

GoM has committed itself to ensuring the blending of liquid fuels and ethanol in the proportion of 80/20 for use in vehicles.

GoM shall promote the use of ethanol in vehicles without mixing with other liquid fuels.

All retail outlets shall ensure that at every filling station there is at least one ethanol pump

to enable motorists to buy ethanol to mix with other fuels or use ethanol without mixing with other liquid fuels. For this purpose retail licences shall be granted with this requirement as a condition of the license.

At each filling station there must be clearly labelled which pump has blended fuel and which ones are purely ethanol with different prices indicated for each type. These prices must be such that ethanol should be the cheapest, seconded by the blended fuel and then lastly the unblended fuel.

MERA shall regulate the production, transportation, storage, safety, pricing, marketing and use of ethanol.

GoM shall facilitate the development of training programmes within vocational and tertiary institutions to address capacity development needs of men and women in the biofuel industry. Relevant curricula shall incorporate modules to build capacity on social and gender integration in biofuels.

7.0 POLICY PRIORITY AREA: LIQUID PETROLEUM GAS

7.1 Issues

Liquefied Petroleum Gas or Liquid Petroleum Gas (LPG or LP gas), also referred to as simply propane or butane, are flammable mixtures of hydrocarbon gases used as fuel in heating appliances, cooking equipment, and vehicles. LPG is prepared by refining petroleum or "wet" natural gas, and is almost entirely derived from fossil fuel sources, being manufactured during the refining of petroleum (crude oil), or extracted from petroleum or natural gas streams as they emerge from the ground. Burning LPG releases carbon dioxide, a greenhouse gas. The reaction also produces some carbon monoxide. LPG does, however, release less CO_2 per unit of energy than does coal or oil. LPG is composed primarily of propane and butane, while natural gas is composed of the lighter methane and ethane (see Wikipedia). This section will mostly focus on LPG.

In the medium to long term, renewable energy in the form of liquid petroleum gas (LPG) and gas have to be an important part of the energy mix because women's reliance on process heat for care giving and productive activities means that although they value electricity for lighting, this source of energy (coupled with its high costs) is not the most practical for their cooking/heating needs. LPG/gas has strong advantages, even compared to biomass, such as:

- It is a more practical and viable option for satisfying energy demands for cooking and heating in societies where access to biomass is being suppressed due to firewood depletion.
- It is an effective mechanism for fighting deforestation and soil degradation
- It offers a much cleaner environment for the user, while reducing greenhouse emissions.
- It is a very convenient and user-friendly mode of energy since it can be switched on and off at any time; and it is highly time saving.

There are however several barriers to increased use of LPG in Malawi. One of them is pricing. GoM needs to look at barriers to lower pricing and increased uptake of LPG, and will identify potential partnerships to promote greater market penetration. There are believed to be major opportunities for LPG if the market size is increased, as scale-economies are large and costs can come down quickly.

Small cylinders can quickly be adopted at household level if the pricing is affordable, unlike big cylinders that require higher purchasing power as well as specialised safety safeguards. Afrox, one of the biggest companies in the LPG business, rents out its cylinders to avoid the burden of buying them. However, the rent payable is still too high for average Malawians.

The second issue is one of safety. Without proper safety training and monitoring we could see a lot of fires and accidents. Communities therefore need to be civic educated on safety issues around LPG. Robust training programmes are necessary on the transportation, distribution, storage and use of gas.

The third barrier is lack of a wide distribution network or system for cylinders. At present these are concentrated in cities and towns. These need to be rolled out to rural areas as well. Wide use of LPG would reduce consumption of wood and thus reduce deforestation and improve the health status of people.

7.2 Objectives

1. **To ensure availability of LPG in sufficient quantities at affordable prices for industrial and domestic purposes and enable a lot of households and institutions to move away from biomass to LPG as fuel for cooking and other purposes**

2. **To stimulate the incorporation of social and gender perspectives throughout the LPG supply chain**

7.3 Policy Statements

GoM shall develop liquid petroleum gas (LPG) and gas as a more sustainable and convenient energy option for process heat through deliberate large-scale investments in LPG and gas, especially in:

a) LPG import distribution and storage infrastructure.

b) LPG cylinders of different size ranges, including small cylinders for low income households.

c) Local gas exploration and extraction.

GoM shall promote the wide use of gas by actively pursuing policies, incentives and promotion activities to tackle issues of cost, safety, acceptability and availability of LPG and gas canisters, and these shall include:

a) Tax and other fiscal incentives to support the developmental stages of introducing and promoting LPG as a heat source.

b) Ensuring that every licensee licensed to distribute or sell gas is enjoined to guarantee availability of gas in secure canisters in all areas in which he has been licensed to distribute at all times and at prices not more than those approved by MERA.

c) Introducing (small) cylinder and stove subsidies in order to reduce end-user costs, and availing financing for cylinder deposit fees and stove purchases through microfinance schemes.

d) Integrating access to LPG with social support measures for the poor (e.g. cash transfers).

e) Encouraging micro finance schemes that are linked to LPG as an energy cooking solution.

f) Organizing and empowering communities as cooperatives or other groupings, including women and youth specific groups, to venture into gas entrepreneurship (distribution and marketing), as well as to provide end-user extension support without compromising safety.

g) Linking the use of LPG to women's economic empowerment incentives/interventions,

h) Introducing and intensifying promotional activities to widely market the value addition of LPG to male and female headed rural households, and to semi-urban households.

i) Piloting LPG in areas where biomass has diminished and/or where the cost of biomass for cooking is high, and documenting lessons for replication.

GoM shall target distribution of gas canisters / cookers, through the private sector and communities, to 300,000 (three hundred thousand) male and female headed households, particularly those who currently use biomass or charcoal, by 2020.

Institutional reforms shall be undertaken in order to create an enabling environment for investments and utilization of LPG, and these shall include:

a) Promoting tax reforms to provide incentives to LPG investors in order to cut down

upfront costs and reduce consumer costs and scale up penetration.

b) Regulating LPG more coherently through the energy regulator, including in relation to:

i. Regulating unsafe practices through clear definition of cylinder ownership; assignment of legal responsibility for cylinder maintenance; repair and replacement; effective enforcement of a ban on cross-filling of cylinders by different suppliers; proper training of operators throughout the supply chain; maintenance of a registry of certified installers and suppliers; wide education campaigns for all end-users, and communicating information in plain language; penalties for suppliers that fill unsafe cylinders; requiring the training of operators and education of consumers, etc.;

ii. Promoting and strengthening industry associations and NGOs that can help with operator training and self-monitoring;

iii. Minimizing shortages by giving incentives to financially viable companies to build more storage capacity and requiring minimum stockholding;

iv. Subsidizing LPG in small cylinders to promote uptake by low income populations;

v. Formally adopting international standards for fuel specifications and safety;

vi. Minimizing short-selling of LPG by effective monitoring and enforcement.

c. Strengthening governance structures, frameworks and operations of LPG/gas supply industries through regulatory mechanisms that facilitate steady social and gender inclusion by licensees, operators and contractors, including by:

i. Integrating in bidding processes a requirement for bidders to include sex disaggregated information on targets for recruitment, management, governance structure composition (and strategies for improving women's participation where applicable);

ii. Putting in place strategies for addressing sex discrimination, sexual harassment, HIV, and even human trafficking, child labour and gender based violence, where applicable; and

iii. strategies for ensuring the availability of resources for social and gender inclusion interventions, as well as for relevant capacity building.

MERA shall continue to regulate all aspects of the gas supply chain and strengthen its regulatory framework.

GoM shall implement the following capacity building measures:

a) Building the capacity of industry association(s) to manage operator training and self-monitoring

b) Training programmes in LPG economic empowerment activities that are inclusive of women as well as male and female youth.

c) Integrating LPG occupational health and safety in relevant tertiary and vocational training programmes

d) Training of LPG players in social and gender inclusion, in various areas of the LPG supply chain, including developing social and gender assessment modules for various LPG training interventions.

8.0 POLICY PRIORITY AREA: COAL

8.1 Issues

Malawi has 1 billion metric tonnes of probable coal reserves, of which 22 million tonnes are proven reserves of the bituminous type. These resources occur in various parts of the Northern Region (Karonga and Rumphi) and the South Region (Lengwe and Mwabvi game reserves in the Lower Shire Valley). Although coal deposits occur at several locations in Malawi, coal mining started only in 1985.

Five main challenges face the Coal Supply Industry (CSI):

1. A lack of price competitiveness for northern Malawian coal compared to imported coal (particularly from Zambia, Zimbabwe and Mozambique).
2. A lack of competition within the industry (eight years after the liberalisation of 1995, there are still just a few mining companies).
3. Low productivity and high production costs owing to the use of obsolete technologies.
4. A general lack of information on firm coal reserves because exploration is limited.
5. An absence of an appropriate regulatory framework to govern downstream marketing, transportation and utilisation.

Uncompetitive prices are also partly attributable to the high cost of transporting coal by road from mines located in Northern Malawi to coal-using industries mainly concentrated in Lilongwe and Blantyre, respectively some 500 km and 800 km away. This should be compared with Moatize coal mines which are only 90 km from Blantyre.

Coal is mostly used by industry, principally in the manufacture of textiles and cement, the processing of tobacco and the production of ethanol. Large public institutions, such as hospitals and prisons, are also substantial consumers. Most households do not use coal because there are no effective coal stoves and its use produces problems in health and safety. It is only now that coal is being promoted for electricity generation.

Coal is probably the biggest polluter of the environment and therefore care has to be taken when using it as an energy source. There are well documented societal and environmental burdens of coal that that occur through its mining, preparation, transportation, combustion, and waste disposal. Some of the impacts to be considered in contemplating how far it should be featured in the energy mix are:

- Coal naturally contains sulphur, and when coal is burned, the sulphur combines with oxygen to form sulphur oxides. Coal-fired power plants are therefore the largest human-caused source of sulphur dioxide, a pollutant gas that contributes to the production of acid rain and causes significant health problems.
- Air pollution from coal mines results from emissions of particulate matter and gases including methane, sulphur dioxide, and nitrogen oxides, as well as carbon monoxide. Methane released by coal mining is a potent global warming gas. Also, the massive carbon dioxide emissions from coal-fired power plants make coal a huge contributor to global warming. Further, black carbon resulting from incomplete combustion is an additional contributor to climate change.
- Coal dust stirred up during the mining process, as well as released during coal transportation can cause severe and potentially deadly respiratory problems.

- Coal combustion waste, is usually disposed of in landfills that are lined with compacted clay soil, a plastic sheet, or both. As rain filters through the toxic ash pits year after year, the toxic metals are leached out into the local environment.
- Coal sludge (slurry), which is the liquid coal waste generated by washing coal, is typically disposed of at impoundments located near coal mines. In some cases it is directly injected into abandoned underground mines. Since coal sludge contains toxins, leaks or spills can endanger underground and surface waters.
- Coal contains many heavy metals, as it is created through compressed organic matter containing virtually every element in the periodic table - mainly carbon, but also heavy metals.
- Water pollution from coal includes the negative health and environmental effects from the mining, processing, burning, and waste storage of coal. Water pollution affects women most as the front line users of water for domestic chores.

The conclusion is that the Regulators need to be vigilant to ensure only minimum pollution or emissions are allowed in the coal supply chain. Some of these regulators are MERA who regulates coal as energy, the Department of Mines that give mining licences, the Directorate of Environmental Affairs that is responsible for reducing pollution or carbon emissions, and the Directorate of Sanitation, which deals with waste disposal and issues of health and sanitation. For MERA it is important that before a licence is issued to an electricity generator who intends using coal, the generator must ensure that carbon emissions are reduced by 80% or more by using appropriate technologies. Transportation, storage, distribution and use must also comply with environmental and waste disposal laws and regulations. Modern technologies are able to reduce the above negative impacts of the use of coal and use of these needs to be enforced and strictly monitored.

8.2 Objectives

1. **To promote the use of coal as a fuel for base electricity generation.**

2. **To create a robust Coal Supply Industry that has broad private sector participation and that competes favourably with those in neighbouring countries.**

3. **To reduce negative impacts of coal storage, haulage and utilization on the environment, and on the health and safety of its handlers and users.**

4. **To ensure the availability of coal in sufficient quantities and at affordable prices both for industrial and household uses.**

5. **To liberalise the coal transportation industry and make it more competitive in a regulated market**

6. **To promote social and gender inclusion in the coal industry supply chain.**

7. **To ensure both male and female indigenous Malawians are empowered to participate fully in the Coal Supply Industry, including in coal mining, distribution, and ownership, franchising and operation of wholesale and retail outlets.**

8.3 Policy Statements

For the foreseeable future, the energy policy shall deal only with downstream issues of coal supply. However GoM shall put in place a coordination mechanism to ensure there is no overlap, contradiction or gaps between Coal Supply Industry's upstream activities, which fall under the Mining Sector, and downstream activities, which fall under the Energy Sector.

GoM shall promote and encourage the private sector to take a leading role in the coal industry subject only to regulatory and licensing requirements.

MERA shall regulate the coal storage, transportation, importation, marketing, usage, and pricing thereof.

Other regulators such as the Directorate of Mining and the Directorate of Environmental Affairs as well as the Directorate of Sanitation and Hygiene shall strictly enforce their respective laws to ensure coal supply chain does not impact negatively on the environment and the health women, men and children.

GoM shall introduce fiscal incentives and low interest loans for both male and female indigenous Malawians to participate in the coal industry supply chain.

GoM shall promote incentives for coal electricity generation for social services.

GoM shall encourage incentive driven investments that explore the potential of coal to stimulate the growth of artisanal and small-scale mining activities through electricity generation in districts that have high concentration of these activities, especially those that are nearest to coal mines.

GoM shall introduce subsidies for effective coal stoves for households use.

GoM shall promote incentive-based research into effective coal stoves and other coal related technologies

GoM shall use tax and other incentives to promote investments aimed at improving the efficiency of coal transportation and storage systems.

MERA shall regulate the pricing of coal whether mined in Malawi or imported to ensure fairness in the pricing system that takes into account the quality of the coal

The Energy Regulator shall implement a systematic programme of inspection of coal combustion installations to ensure that they abide by set minimum standards.

GoM shall draw up and strictly enforce regulations that will militate against the negative impacts of coal storage, haulage and utilization on the environment, and on the health and safety of its handlers and users.

GoM shall support research into, and the development of, more efficient coal-combustion technologies.

GoM will assess the feasibility of tapping coal-bed methane as a commercial product, and where applicable, will promote commercial ventures in this area.

GoM shall promote awareness programmes to promote the health and safety of coal handlers and users, including targeting low income households

GoM shall, through market and fiscal incentives, promote safe coal-dust briquetting as part of women and youth economic empowerment programmes.

GoM shall encourage other players to participate in coal haulage and brokerage contract arrangement with wholesalers under the supervision of the Energy Regulator.

GoM shall promote coal marketing strategies which purposefully reach women and low income as household end users

GoM shall develop legislation and regulations on coal marketing, stockpiling and utilisation.

Regulatory aspects of the Coal Supply Industry shall be strengthened to ensure that the industry is facilitating inclusive growth and gender equality in issues of licensing, concessions, governance, procurement, recruitment, conditions of service, internal policies and strategies, monitoring etc; Addressing HIV, sex discrimination, sexual harassment, human trafficking, child labour and other facets of gender based violence in the Coal Supply Industry shall be crucial.

On capacity building, GoM shall:

a) Build capacity in modern coal combustion technologies by providing equal opportunities for men and women in relevant research and trainings.

b) Build adequate capacity to avoid, mitigate and manage environmental impacts of coal during mining, preparation, transportation, combustion, and waste disposal.

c) Strengthen programmes aimed at building the skills of low-income women (as major users of biomass) in the safe production of briquettes from coal dust, and promoting the use of the technology.

d) Promote, including through financing, the capacity of women and youth to be involved as entrepreneurs in the coal supply chain, starting from local levels (using coal briquettes as an alternative for household energy) to medium and large enterprises.

9.0 ENERGY EFFICIENCY

9.1 Issues

Energy efficiency is of paramount importance in any economy, if it is to perform soundly. Reduction of greenhouse gases (GHG) emissions is the driver for energy policies world-wide, and it is being addressed through both improved energy efficiency and increased levels of renewables in national energy mixes. SDG No. 7, which is about 'ensuring universal access to affordable, reliable and modern energy services, has four targets that should be met by 2030. There include **increasing substantially the share of renewable energy in the global energy mix** and **doubling the global rate of improvement in energy efficiency**. Similarly, the SE4All initiative aims at achieving three main goals by 2030, which include **ensuring universal access to modern energy services** and **doubling the global rate of energy efficiency.**

The Energy Sector in Malawi is beset by inefficiencies in most of its sub-sectors, which adversely impact their performance. The major issues, which are prevalent on both the supply and demand sides, are presented below.

9.1.1 Electricity

i Generation

The country currently relies on only one power supply utility (ESCOM), whose system has generation capacity constraints, which have resulted in a serious power shortage that is crippling to existing industries and not conducive to new investments. ESCOM's total installed capacity, inclusive of the thermal plants, is currently about 352.00 MW against a demand estimated at 382MW but suppressed to 350MW. Malawi's electricity generation being predominantly hydro-based, the drought that has hit most countries in the Region have exacerbated the problem as water reservoirs are being depleted fast, thereby reducing the available energy. The reforms that are now underway to create a conducive environment to private sector participation in the ESI, through which alternative and more reliable sources of energy are expected to harness, need to be expedited.

ii Transmission

ESCOM's Transmission system has bottlenecks that limit its capacity to efficiently transport electrical energy from the generating stations to remote load centres. While a number of interventions are already been made to address this issue (through such projects as the MCC Malawi Compact and the ESSP), a lot more work needs to be done to fully address the issue. The imminent unbundling of ESCOM to create a GenCO and a TDC will enable the latter focus on further strengthening the transmission system.

iii Distribution

ESCOM's Distribution system has excessive technical and non-technical losses, currently estimated at over 20%. These are the results system bottlenecks theft of electricity respectively. While efforts to reduce losses through various measures, such as DSM and detection of illegal connections, these efforts need to be intensified and sustained.

iv Rural Electrification

Rural Electrification is currently limited to grid extensions targeting selected trading or rural growth centres in the districts. This leaves the majority of the rural populace

dependent on biomass as the main energy source. To address this limitation, GoM needs to promote installation of stand-alone mini grids in areas remote from the grid, in parallel with the grid extensions.

v Electricity from Renewable Sources

Malawi's energy mix currently has a very low contribution from renewable energy sources, due to the barriers to exploitation of these referred to in sub-section 4.5.1 hereof. GoM needs to address these barriers with a view to facilitating implementation of more Renewable Energy projects, thereby increasing the share of clean and efficient energy sources in the energy mix.

9.1.2 Biomass

The country is experiencing severe degradation of its forestry resources through inefficient and unsustainable use of fuel wood and charcoal. Continued reliance on firewood and charcoal in the light of forest degradation sabotages development therefore calls for urgent energy efficient solutions. For biomass to be truly renewable, it must be utilised in a sustainable manner, which entails replanting of tees with focus on the fast growing varieties, and use of more efficient brick and charcoal kilns and cook stoves.

9.1.3 Liquid Fuels and Biofuels

1. Importation and Storage of Liquid Fuels

In 2010, GoM established the NOCMA, which has constructed or rehabilitated liquid fuel storage tanks in Blantyre, Lilongwe and Mzuzu with a combined storage capacity of 60 million litres. The major outstanding issue here is the actual procurement and storage of the fuel, the main point of contention being the granting of import licences to non-oil marketing companies, which raises questions about the criteria applied in granting such licences. The Oil Marketing Companies, which invest in infrastructure, should be the ones supplying liquid fuels to those that need them.

2. Ethanol

The Malawi Ethanol Programme of 2013 undertook to '***increase ethanol production and its use as fuel from the current 18 million litres per annum to 49 million litres and 104 million litres per annum by 2015 and 2020 respectively***', there is no evidence on the ground to show this policy objective has been achieved. It is noted that there is no reserve infrastructure for the blended fuel and supply is straight into the tanks at pump stations. There are also no dedicated tanks at the pump stations for ethanol. However, Press Corporation Limited (PCL) through its subsidiaries PressCane and Ethco are now planning to invest in new plants that will produce ethanol directly from cane juice, thereby contributing towards achieving the goal. PCL is also championing the Ethanol Driven Vehicle Project (EDVP) which, once operationalized, will give motorists the choice of using ethanol as a standalone fuel or part of a petrol-ethanol blend in their vehicles. With this development, dedicated ethanol pumps will now be installed at filling stations. Fuel dealerships such as Puma Energy are ready to start selling ethanol fuel as soon as a pricing mechanism is in place.

9.1.4 Liquid Petroleum Gas

Liquid Petroleum Gas (LPG) is produced during the refining of petroleum (crude oil), or extracted from petroleum or natural gas streams as they emerge from the ground. While

burning of LPG releases carbon dioxide (CO_2) and carbon monoxide (CO) the quantities released per unit of energy are less than those from coal or oil.

Other strong advantages of LPG, even compared to biomass, are:

- It is a more practical and viable option for satisfying energy demands for cooking and heating in societies where access to biomass is being suppressed due to firewood depletion.
- It is an effective mechanism for fighting deforestation and soil degradation
- It offers a much cleaner environment for the user, while reducing greenhouse emissions.
- It is a very convenient and user-friendly mode of energy since it can be switched on and off at any time; and it is highly time saving.

One of the major barriers to increased use of LPG in Malawi is pricing. GoM needs to look at ways of lowering the price of LPG with a view to achieving increased uptake thereof.

9.1.5 Coal

Substantial coal resources have been identified in the country, and GoM has made a decision to implement the country's first major coal-fired at Kam'mwamba in Balaka District, which will initially contribute 300MW to the country's installed generation capacity. A private investor, Intra Energy Corporation, is also developing a coal-fired power station, with a design installed capacity of 120MW. Progress with this project is, however, very slow, mainly on account of delayed execution of the requisite agreements with the Off-taker (ESCOM) and GoM.

While coal is a reliable source of energy for base load generation, it presents challenges to the environment that call for serious mitigation measures. These challenges have already been elaborated in Chapter 8. GoM needs to ensure that the Kam'mwamba and all others like it are subjected to rigorous Environmental and Social Impact Assessments before they are implemented. In the long term, GoM should aim at increasing the share of renewable energy sources in the energy mix with a view to decommissioning the coal-fired power plants at the end of their useful lives.

9.2 Objectives

1. **To increase generation capacity to levels that will meet the existing and projected demands.**
2. **To encourage private investors to operate their power plants prudently and efficiently so as to maximise returns.**
3. **To further strengthen the country's Transmission and Distribution systems with a view to increasing energy transfer capacities and minimizing technical losses.**
4. **To intensify identification of sources of non-technical losses and ensure that these are positively dealt with.**

5. **To increase access to clean electricity for the rural populace through implementation of stand-alone mini grid projects using Renewable Energy Technologies.**

6. **To ensure use of improved technologies to save energy in cook stoves, brick kilns and charcoal production.**

7. **To reduce the dependence on raw firewood and charcoal by increasing access to *charcoal briquettes* as an affordable and reliable alternative source of energy for cooking and heating**

8. **To ensure increased production of ethanol for use as a standalone fuel or blending with petrol and diesel.**

9. **To ensure availability of LPG in sufficient quantities at affordable prices for industrial and domestic purposes and enable a lot of households and institutions to move away from biomass to LPG as fuel for cooking and other purposes.**

10. **To institute stringent ESIA requirements on all coal-fired electricity generation projects.**

9.3 Policy Statements

GoM shall expedite implementation of the ongoing power market and associated legislative reforms to ensure adequate private sector participation in electricity generation through IPP and PPP projects.

GoM shall see to it that all processes leading to construction of generating plants, e.g. Feasibility Studies, ESIAs, execution of Power Purchase Agreements and Implementation Agreements, are done without any hindrances.

GoM shall empower the Energy Regulator to closely monitor all generation operations with a view to ensuring that high levels of efficiency are attained and maintained. In the case of coal-fired generation plants, GoM shall support research into, and the development of, more efficient coal-combustion technologies, and provide incentives to promote investments aimed at improving the efficiency of coal transportation and storage systems.

GoM shall ensure that power system losses are reduced to acceptable losses by:

(i) facilitating securing of financing by the TDC for Transmission and Distribution system strengthening as well as DSM projects; and

(ii) supporting the TDC's efforts to identify and deal with cases of theft of electricity.

GoM shall promote installation of mini grids based on renewable energy sources, e.g. micro to small hydro, Solar PV, Wind and Geothermal. This should be done by both the GoM-owned GenCO and private generators.

GoM shall progressively increase the share of renewable energy sources in the energy mix with a view to eventually moving away from coal-fired generation. To this end, the number of

coal-fired power plants to be installed needs to be limited to that required to meet the demand while the RETs are being developed.

GoM shall intensify promotional activities for improved cook stoves, brick kilns, charcoal kilns, and other alternative energy technologies nationwide.

GoM shall ensure priority funding for NGOs and industries in the production and distribution of high quality energy efficient cook stoves, and promote the uptake of these modern cook stoves by facilitating price reductions for the poor through:

(i) nationwide credit facilities to the end users; and

(ii) linking access to improved cook stoves with social support measures for the poor (e.g. cash transfer programmes).

GoM shall expedite the restructuring of the liquid fuels market to ensure more efficient importation and distribution, supported by adequate storage facilities.

GoM shall support PressCane's and Ethco's plans to increase production of ethanol directly from cane juice from cane supplied by smallholder cane growers, and encourage other investors to do venture into ethanol production.

GoM shall facilitate operationalization of PCL's EDVP by expediting the putting in place of a pricing mechanism for ethanol fuel.

GoM shall promote wide use of LPG through policies, incentives and promotional activities designed to address issues of cost, safety, acceptability and availability of LPG. Availability of LPG in secure canisters shall be ensured in all areas where it is distributed.

GoM shall use tax and other incentives to promote investments aimed at improving the efficiency of coal transportation and storage systems.

GoM will assess the feasibility of tapping coal-bed methane as a commercial product, and where applicable, will promote commercial ventures in this area.

10.0 IMPEMENTATION ARRANGEMENTS

10.1 Institutional Arrangements

There are various Ministries, Departments and sector policies that have impact on energy policy. It is important to see to it that all these are properly coordinated in order to ensure consistency and smooth implementation of the policies including energy policy. The roles and responsibilities of each sector as it impacts on energy need to be clear so that there are no conflicts or duplications or gaps. Some of these policies are Environment; Forestry; Minerals and Mining; Water, Sanitation and Hygiene; Land and Agriculture. Some of these are highlighted in the implementation plan below. In this subsection, we list below some of the key ministries, departments and institutions and their roles and responsibilities in the implementation of this policy. These are as follows:

10.1.1 Department of Energy Affairs

a) Provide overall leadership in matters of downstream energy activities b) Oversee the reforms in the energy sector and ensure these reforms are executed efficiently c) Ensure legislation is enacted for the unbundling of ESCOM into two companies one for generation and another for transmission and distribution. d) Ensure energy statistics are compiled by all institutions mandated to do so and collected by DoE and that these are updated regularly in consultation with NSO e) Ensure NOCMA maintains liquid fuel stocks equivalent to 60 days' supply in the strategic reserves and that any fuels withdrawal below 60 days supply must be done only with written approval of the Minister and not otherwise. f) Ensure that coal powered generation power plants do not cause harmful emissions beyond the set limits.	g) Create the Rural Electrification Authority as a semi-autonomous legal entity under an Act of Parliament and that its mandate includes renewable energy activities h) Ensure the policy implementation targets are achieved within the time frames indicated i) Carry out overall energy supply and demand forecasts with input from the single buyer transmission and distribution company on electricity side j) Mobilise resources to bring power (grid extension, mini grids or RE) to all rural public schools, health facilities and police units in Malawi k) Mount a vigorous campaign to educate the masses on the importance of improved cook stoves, brick kilns and charcoal kilns. l) Oversea the restructuring of the liquid fuels market m) Annually tender out procurement of fuel for the nation

10.1.2 Department of Forestry

a) Ensure there is enough biomass supply to meet the needs of the population b) Ensure trees and other biomass resources are managed sustainably c) Ensure strict adherence to the criteria for granting licences for charcoal making d) Encourage people to grow fast growing trees including bamboos for domestic needs as well as commercial purposes.	e) Enforce the legislation on forestry and forestry products for sustainability of these resources. f) Ensure forests, whether national, community or village forests are managed sustainably and villagers are able to harvest from village forests for domestic needs g) Encourage communities to form cooperatives or other groupings for tree growing, charcoal making and tree harvesting and within the limits of the law.

10.1.3 Department of Mining

a) Promote and ensure environmentally friendly mining practices that ensure that emissions of harmful substances are limited to acceptable levels and pollution is minimised.	b) Promote the exploration and production of petroleum in Malawi. c) Ensure the Petroleum legislation is updated d) Manage the upstream activities of liquid fuels.

10.1.4 Department of Environmental Affairs

a) To be strictly checking and measuring carbon emissions from energy operations such as coal fired power stations, cook stoves etc and keep records of the country's emissions. b) Ensure every project requiring environment impact assessment including energy projects have such assessment and strictly adheres to any impact mitigation measures	c) Report on the country's emissions and whether the country is achieving the set goals on emissions or not d) Ensure all are strictly adhering to the requirements of the Environment Management Act

10.1.5 Ministry of Natural Resources Mining and Energy

a) Build capacity of:

b) local private operators in the development of bankable off-grid project proposals as well as in accessing carbon financing;

c) local financial institutions in appraising renewable energy power projects, especially community or decentralised ones;

d) the MBS and MERA to support the development of renewable energy standards and certification schemes for installers;

e) rural communities in entrepreneurial and technical skills in RE technologies and enterprises, targeting the equal participation of men and women;

f) the DoE in renewable energy resource assessment;

g) the DoE and Renewable Energy Agency in developing, implementing, budgeting for, monitoring and evaluating all renewable energy interventions from a social and gender perspective and building strong capacity in collecting and analysing sex disaggregated data;

h) training institutions (Universities, technical colleges including the newly launched community colleges) to train more male and female professionals, technicians and artisans in RE development (where applicable), installation and maintenance;

i) RE training institutions to deliver gender mainstreaming modules in their programmes in order to institutionalise gender responsive approaches to RE; and

j) Agricultural NGOs, extension workers etc. to train low-income male- and female-headed households in the agricultural application of bio-slurry as a way of improving their food security.

k) Establish an energy resources coordination directorate to coordinate all energy resources upstream and downstream to ensure smooth operation of these activities without conflict or gaps.

l) Ensure legislation is put in place to give power to the said directorate to be coordinator and to lay down operational rules to be adhered by all institutions dealing with energy. Such institutions will be classified as lead agencies in respect of their subsector and to be enjoined to adhere strictly to their particular legal framework

m) Such coordinating directorate shall also be coordinating biomass energy activities and act as a link between down stream and upstream issues and coordinate with other Ministries such as Forestry, Water, Lands and Agriculture.

n) Enact the Energy (Improved Biomass Cook Stoves) Regulations under the Energy Regulation Act.

o) Ensure availability of sufficient ethanol in all filling stations for blending and non blending purposes.

p) In liaison with MERA ensure oil marketing companies are holding fuel stocks equivalent to 15 days of their average sales.

10.1.6 Single Buyer Transmission and Distribution Company

a) This company shall be responsible for the following: b) It shall own, operate and maintain transmission lines c) It shall be the Single Buyer of power such that all generation companies shall sell all their power to it and it shall sell the power to large customers or sell power to customers through the Distribution division.	d) It shall do power trading, including being the sole importer and exporter of power. e) It shall do system planning including determining the generation and transmission expansion projects timing, and generally electricity demand and supply forecasting. f) It shall manage the tendering and award of new generation stations whether under IPP system or PPP arrangements in liaison with other competent authorities

These responsibilities are further expanded in the implementation matrix below.

10.2 Implementation Plan

We will include a broad statement of the key issues of the implementation plan.

10.3 Monitoring and Evaluation

We will indicate a monitoring and evaluation strategy that will be put in place to track the implementation of the policy. This will also include a statement on time frame for policy review.