



National Energy Efficiency Action Plan (NEEAP)

The Gambia

Period [2015-2020/2030]

**Within the implementation of the
ECOWAS Energy Efficiency Policy (EEEP)**

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ABBREVIATIONS AND ACRONYMS

ATK	Aviation Turbine Kerosene
BANDES	Economic and Social Development Bank of Venezuela
CCSFM	Community Controlled State Forest Management
CDM	Clean Development Mechanism
CFL	Compact Fluorescent Light
CFMC	Community Forest Management Concept
CILLS	Permanent Interstate Committee for the Control of Drought in the Sahel
DANIDA	Danish International Development Agency
DCD	Department of Community Development
DWR	Department of Water Resources
ECOWAS	Economic Community of West African States
EU	European Union
GAMFINET	Gambia Micro-Finance Network
GBOS	Gambia Bureau of Statistics
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFMC	Gambia Forest Management Concept
GIEPA	Gambia Investment and Export Promotion Agency
GNPC	Gambia National Petroleum Company
GREC	Gambia Renewable Energy Centre
GTTI	Gambia Technical Training Institute
GTZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GWh	Giga watt hour
GSB	Gambia Standards Bureau
IFAD	International Fund for Agricultural Development
IPP	Independent Power Provider
JFPM	Joint Forest Park Management
KWh	Kilo Watt hour
LPG	Liquefied Petroleum Gas
MOE	Ministry of Energy
MOECCWRW	The Ministry of Environment, Climate Change, Water and Wildlife
NEC	The National Environment Agency
NARI	National Agricultural Research Institute
NAWEC	National Water and Electricity Company

NGO	Non-governmental Organization
OMVG	Organization for the Development of The Gambia River Basin
PAGE	Programme for Accelerated Growth and Employment
PPA	Power Purchase Agreement
PURA	Public Utilities Regulatory Authority
PV	Photovoltaic
RE	Renewable Energy
REAGAM	Renewable Energy Association of The Gambia
SE4ALL	Sustainable Energy for All
TES	Total Energy Supply
TOE	Tonnes of Oil Equivalent
TPES	Total primary energy supply
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNSO	United Nations Sahelian Office
UTG	University of The Gambia
WAPP	West African Power Pool

1 EXECUTIVE SUMMARY

The ECOWAS Renewable Energy Policy (EREP) and the ECOWAS Energy Efficiency Policy (EEEP), prepared with technical support of the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) and a broad range of international partners, were adopted by ECOWAS Heads of State on 18 July 2013. According to the EEEP, all fifteen ECOWAS countries shall adopt, by the end of 2014, five year rolling NEEAPs that will contribute to the achievement of the regional ECOWAS targets in the next two decades. This document is a template for these Action Plans.

In spite of the government's recognition of the inefficient and unsustainable current patterns of domestic energy production and use, no specific energy efficiency policy document exists. Articulations of energy efficiency policy measures are hitherto embodied as provisions in the Electricity Act and Energy Policy of 2005 which has just been updated to a new National Energy Policy and Strategies and Action Plan which include provisions for energy efficiency sub-sectoral development policy objectives, policy elements and strategies as elements of the framework for the development and implementation of the energy sector programmes in the medium term (2014-2018):

Like the policy, there is no specific legal, regulatory and institutional framework for energy efficiency in The Gambia. These issues like the policy are treated within the overall energy sector legal, regulatory and institutional framework summarized hereunder:

The Electricity Act of 2005 and the Renewable Energy (RE) Act of 2014 provide provisions for the legal aspects for energy efficiency. The Gambia Public Utilities Regulatory Authority Act of 2001 which established the Gambia Public Utilities Regulatory Authority (PURA) constitutes the regulatory aspect of the authority over energy efficiency. The institutional aspects of the framework comprise four major actors – policy makers, regulators, operators and primary energy suppliers. These actors can be conveniently grouped into governmental/public sector institutions, private sector institutions and, academic and research institutions.

There has not been any comprehensive study and/or assessment of energy efficiency potentials in the country so far. A 2009 diagnostic survey estimated that 305,000 incandescent bulbs of assorted watts were in use by residential clients which could be substituted with CFL bulbs at an estimated cost of US\$450,040 yielding an estimated saving of about US\$164,000 per month. However, due to the 'one spot' nature of the result of this diagnostic survey, it is not possible to build realistically plausible targets and trajectories of the potentials for energy savings in other sectors / fields from it.

The status of energy efficiency in 2010 and specified targets that The Gambia intends to achieve by 2020 and 2030 as contribution to the attainment of the ECOWAS Energy Efficiency Policy targets are scanty. A review of the summary of targets reveals that no targets have been set for energy efficiency standard and labels; the EEP targets for energy efficient lighting in terms of penetration rates of on-grid and off-grid energy efficient lights are adopted by the country; targets for total losses in the power system have been set for high performance distribution of electricity; and, targets are set for the percentage of energy savings in the building sector and industry as established by AEA scenario analyses.

A review of the general indicators for the period 2010/2013 reveals that: population in number of inhabitants ranged from 1.64 million in 2010 to 1,88 million in 2013; population growth rate ranged from 2.5% in 2010 to 3.3% in 2013; and, family size in terms of person/housing unit ranged from 8persons/housing unit in 2010 to 8.2 in 2013.

Macro-economic energy efficiency indicators for the period 2006/2010 and targets up to 2030 are scanty. Indicators in terms of primary energy intensity, final energy intensity and electricity intensity figures are available for only the period 2006/2009. Final energy consumption per year figures are available for only the period 2006/2010 whereas the annual electricity consumption per capita/year, electricity consumption/household and electrification rate (%) targets are available for the period 2006/2030.

In the absence of a comprehensive energy efficiency assessment in the country no national energy efficiency targets and trajectories have been set. However within the frameworks of its support to the NREAP-NEEAP-SE4ALL process in The Gambia, scenarios for the contribution of energy efficiency in the electricity and cooking sectors were developed. The analysis of the simulation results provided sectorial energy efficiency targets in 2020 and 2030 which are adopted as what The Gambia intends to achieve by 2020 and 2030 as contribution to the attainment of the EEP's targets. The sectoral categories include efficient lighting, high performance distribution of electricity, energy efficiency standards and labelling, buildings and Industry.

The key national public institutions in charge of NEEAP implementation will include the Office of the President, Ministries of Energy; Finance and Economic Affairs; and Petroleum, Public Utilities Regulatory Authority, Gambia Investment and Export Promotion Agency, Forestry Department, Department of Water Resources, the University of The Gambia, Gambia Technical Training Institute, National Agricultural Research Institute, Women's Bureau, the Gambia Bureau of Statistics and Gambia Standards Bureau assisted by other stakeholders as deemed necessary.

The effective implementation of the energy efficiency targets and trajectories that the country intends to achieve by 2020 and 2030 as contribution to attainment of the targets of the EEEP will depend on the appropriateness of the measures and activities it adopts to create an enabling environment for actors. Some of the key elements of such an enabling environment include a well-conceived policy regime; a vibrant institutional, legal and regulatory framework; mechanisms for incentive planning of rules and behaviour; responsive organizational arrangements; and a well-designed regime of inducements and deterrents for individual actions. Thus, measures and activities are proposed to this effect within the following selected nine thematic areas of particular relevance to achieving sustainable energy efficiency objectives of the country:

- Efficient lighting initiatives – four measures;
- Standards and labelling initiatives – four measures;
- Energy efficient building initiatives – five measures;
- Electricity distribution initiatives – one measure;
- Cooking initiatives – four measures;
- Energy efficiency in the industrial sector – two measures;
- Energy efficiency in the transport sector – four measures;
- Other sectors (agriculture fisheries, etc.) – three measures; and,
- Cross-cutting measures – six.

The public consultation carried out for the preparation of this National Energy Efficiency Action Plan took the form of a national Kick-Off Meeting at the inception of the process and subsequently a National Review and Validation Workshop of the Baseline Report of the consultant. Nine key stakeholder institutions are represented on the national Steering Committee for the preparation of this National Energy Efficiency Action Plan:

The national authority for the follow-up of the National Energy Efficiency Action Plan is the Ministry of Energy.

A monitoring system, including indicators for individual measures and instruments, will be developed with the support of ECREEE, in order to follow-up the implementation of the National Energy Efficiency Action Plan (NEEAP).

The ECOWAS region has a series of on-going regional policies and initiatives in the field of energy efficiency: A summary of these regional initiatives is appended herewith as Annex II. Synergies between these programmes and the proposed measures in this plan will be exploited and the country will actively participate in the regional initiatives.

2 INTRODUCTION

The ECOWAS Commission has developed the ECOWAS Energy Efficiency Policy (EEEP) which includes targets, measures, standards and incentives for energy efficiency (EE), to be implemented at both regional and national level. It was adopted by the ECOWAS Heads of State and Government in July 2013. According to the EEEP, all fifteen ECOWAS countries shall adopt, by the end of 2014, five-year rolling NEEAPs that will contribute to the achievement of the regional ECOWAS targets in the next two decades.

The NEEAPs have been prepared by the ECOWAS Member States in accordance with a template provided by ECREEE. The NEEAPs include baseline data on the status of energy efficiency development, and propose attainable energy efficiency targets based on national potentials and socio-economic assessments. Moreover, an overview on concrete laws, incentives and measures to be implemented by the country to achieve the targets will be included. The implementation of the NEEAPs will be monitored by the Ministry of Energy and ECREEE on behalf of the ECOWAS Commission during a continued consultative process. The NEEAP template was prepared with technical assistance of ECREEE and UNIDO. The NEEAP development process has been supported by a broad range of partners such as the GEF Strategic Programme for West Africa, GIZ, the Governments of Austria and Spain.

As part of the template, the technical experts also prepared general instructions and a comprehensive compendium of definitions of energy terms and concepts appended herewith as Annex 1. Except otherwise stated, the use of terms and concepts in this report assume those definitions.

3 SUMMARY OF NATIONAL ENERGY EFFICIENCY POLICY

In spite of the government's recognition of the inefficient and unsustainable current patterns of domestic energy production and use, no specific energy efficiency policy document exists. Articulation of energy efficiency policy measures are hitherto embodied as provisions in the Electricity Act and Energy Policy of 2005. The review of the 2005 Energy Policy has just been completed and the resultant National Energy Policy and Strategies and Action Plan have been validated and adopted.

Consistent with the goals of the energy sector as articulated in the national Vision 2020 document, the new national energy policy (strategy) includes provisions for energy efficiency sub-sectoral development policy objectives, policy elements and strategies as elements of the framework for the development and implementation of the energy sector programmes in the medium term (2014-2018):

Policy Objective 1: Encourage energy efficiency

Policy Elements:

- Reduce household energy consumption by promoting the use of efficient appliances.
- Curtail the sharp growth in electricity consumption.

Strategies:

- Introduce mandatory labelling of energy appliances including fridges, air conditioners, etc.
- Impose a viable VAT that discriminates based on performance standards.
- Public sensitisation on energy efficient appliances

Policy Objective 2: Restrict the importation and use of high-energy consumption electrical appliances

Policy Elements:

- Introduce more energy efficient appliances and avoid old and outdated appliances as they tend to draw more energy from the grid, contributing to higher energy losses.
- Reduce environmental damage through use of ozone friendly gases in refrigerators and similar appliances.

Strategies:

- Introduce Regulation prohibiting or restricting the importation of used fridges and air conditioners.
- Offer incentives to companies importing new and low energy consumption appliance (fridges and air conditioners).
- Phase out the importation of incandescent bulbs (set target date) and promote energy efficient lighting including CFL, LEDs.
- Develop a comprehensive Public Lighting Policy that incorporates RE and standards on luminance and energy efficiency of lamps.

Policy Objective 3: Reduce electricity network losses:

Strategies:

- Conduct a comprehensive study on network losses.
- Carry out Power Factor improvement project to reduce reactive power.
- Maintain and enforce standards on the length of distribution lines and circuits.

Policy Objective 4: Promote energy conservation in transport sector

Strategies:

- In collaboration with relevant institutions and ministries, develop an information system on number of vehicles in the country (petrol, diesel, fleet profile, etc.) and determine consumption patterns.
- Provide tax breaks and incentives for low consumption vehicles, new vehicles and increase taxes on older and higher fuel consumption vehicles.
- Encourage urban public transportation to reduce energy density of current van based transportation.

Hitherto the most important overarching programmes and strategies to boost energy efficiency in the country include:

- i. The search and promotion of improved devices for domestic uses mainly for woodfuel (firewood and charcoal) concentrating on: improved cooking systems with emphasis on modern and sustainable fuels, and more efficient cook stoves; and, mechanical power mainly for agro/food processing and water pumping.
- ii. A national energy efficiency programme: with assistance from ECOWAS, the government undertook a number of important policy actions in the areas of electricity for lighting and household appliances since 2008 to implement a national energy efficiency programme through the following strategies:
 - a) Banning the use of incandescent bulbs in government offices and buildings;
 - b) Instituting an import duty waiver on energy efficient equipment;
 - c) Commenced substituting an estimated 305,000 incandescent bulbs of different watts with Compact Fluorescent Lamps (CFLs) in the residential sector at an estimated cost of US\$ 450,000; and,
 - d) Embarked upon a sensitization and public awareness campaign on the efficient use of electricity and cook stoves through leaflets, posters and television panel discussions.
- iii. A nationwide sensitization campaign: under its Environment & Energy sectors support programme, the UNDP complemented the foregoing efforts of the government through the implementation of the following nationwide strategy elements:
 - a) Development and distribution of printed leaflets, posters and T-shirts for sensitization;
 - b) Conduct nationwide sensitization campaign including TV panel discussion;
 - c) Preparation of drama tapes in 4 main local languages and being shown on Gambia Radio and Television Services; and,
 - d) Erecting of Bill boards at strategic locations for public sensitization.
- iv. A CDM programme: the MOE also initiated work on a Clean Development Mechanism (CDM) programme for replacement of incandescent lamps. This initiative is currently stalled by lack of data.
- v. Infrastructural development/improvement project: improving the insufficient quality and availability of transmission and distribution lines is recognized as an important supply-side energy efficiency measure to reduce the high losses of NAWEC. Thus the government implemented the first phase of the Economic and Social Bank of Venezuela (BANDES) support project which has enabled NAWEC to reduce these losses from 30% to 22% (RRA).

Overall the response of the private sector business community and consumers to the sensitization and awareness programme and other policy measures especially fiscal, has been very positive. Private businesses in electrical equipment have started importing energy saving electric bulbs and consumers, both institutional and household, have started buying these bulbs in good quantities to replace their incandescent bulbs.

Current Legal, Regulatory and Institutional Framework

There is no specific legal, regulatory and institutional framework for energy efficiency in The Gambia. These issues like the policy are treated within the overall energy sector's legal, regulatory and institutional framework summarized hereunder:

Legal Aspects: The Electricity Act of 2005 and the RE Act of 2014 provide provisions for the legal aspects for energy efficiency

Regulatory Aspects: The Gambia Public Utilities Regulatory Authority Act of 2001 which established the Gambia Public Utilities Regulatory Authority (PURA) constitutes the regulatory aspect of the authority over energy efficiency. Other regulatory aspects are performed by the Ministry of Finance, the Forestry Department established by the Forestry Act and regulations of 1977 and 1978 and the Gambia Investment and Export Promotion Agency (GIEPA) created by The Gambia Investment and Export Promotion Agency Act of 2010.

Institutional Aspects: The institutional aspects of the framework comprise four major actors. These are policy makers, regulators, operators and primary energy suppliers. These actors can be conveniently grouped into governmental/public sector institutions, private sector institutions and, academic and research institutions.

The governmental/public institutions are: Office of the President, the Ministry of Energy, the Ministry of Finance, Ministry of Environment ,Climate Change, Water Resources and Wildlife (MoECCWRW), the Public Utilities Regulatory Authority (PURA), the Forestry Department in the MoECCWRW, The Department of Water Resources in MoECCWRW, the Department of Community Development which is under the Ministry of Local Government and Lands and the Gambia Investment and Export Promotion Agency (GIEPA).

The Private Sector Institutions comprise GAM Petroleum, an affiliate of GEG and associated oil marketing companies (Galp Energia Gambia Ltd, Total Ltd, Elton Oil Ltd, GNPC and Castle Oil Ltd) and the 17 to 19 enterprise members of the Renewable Energy Association of The Gambia (REAGAM).

The Academia and Research Institutions comprise the University of The Gambia (UTG), Gambia Renewable Energy Centre (GREC), Gambia Technical Training Institute (GTTI) and National Agricultural Research Institute (NARI).

A number of important legal documents and measures with regard to energy efficiency exist in The Gambia. Table 1 summarizes these legal documents and measures. Energy efficiency in the electricity sub-sector is of recent concern compared to energy efficiency in fuelwood however, equally important programmes, especially at public and household level, have been initiated in the sub-sector since 2008.

Table 1: Relevant Legal Documents and Measures with Regard to Energy Efficiency

Name of the legal act or measure	Type (law, regulation, campaign, etc.)	Year of release	Main characteristics
The Electricity Act of 2005	Law	2005	To develop and promote cost-effective generation, transmission, and distribution of electricity, set standards for electricity services, determine appropriate tariffs, and enable a transition to a private investor controlled and operated electricity sector. The Act identifies the Gambia Public Utilities Regulatory Authority as the authority over licensing and tariff setting for electricity generation and sales.
Renewable Energy Act	Law	2013	The Renewable Energy Act was enacted by the National Assembly in December 2013 with the key objective of promoting the use of Renewable Energy resources in order to achieve greater energy

Name of the legal act or measure	Type (law, regulation, campaign, etc.)	Year of release	Main characteristics
			<p>self-reliance which will thus reduce the nation's exposure to fossil fuels, harmful emissions and the demand burden currently on NAWEC in regards to the supply of electricity.</p> <p>The Act calls for an establishment of a Renewable Energy Fund, the management of which will fall under the purview of PURA in ensuring the promotion, development, sustainable management and utilisation of Renewable Energy Resources with key emphasis on community based projects. The sources of money for the fund shall range from funds appropriated by the National Assembly to donations, grants and gifts received for Renewable Energy Activities.</p> <p>In encouraging investment into the Renewable Energy Sector, the Act also introduces General Incentive provisions which provide exemptions on paying import tax and duty on Renewable Facilities. There is also a corporate tax and retail tax exemption on all Renewable Energy facilities for a period of 15 years after commissioning.</p> <p>The Act also tasks the Ministry of Energy to coordinate with other authorities such as PURA and National Environment Agency (NEA) in developing streamlined licensing/permitting processes to create better certainty and investor confidence for prospective developers of systems using Renewable Energy Resources.</p> <p>It is also a requirement under the Act that Installers of Renewable Energy Equipment are appropriately trained with certification. Installers are required to provide guarantees to clients to denote proper installation and for warranty purposes. The guarantee period as provided by the Act is at least 6 months or any such period as determined by PURA.</p>
The Gambia Public Utilities Regulatory Authority Act of 2001	Law	2001	Established PURA as the authority over licensing and tariff setting for electricity generation and sales.
National Energy Policy and Strategy – 2014-2018	Policy	2014	Provides the framework for the energy sector development policy objectives, policy elements and strategies for the development and implementation of programmes and projects of the sector for the period 2014/2018.
Models: Licence for petroleum exploitation, development and Production and, Agreement for petroleum production sharing	Regulatory	2004	Aims at developing a sound framework for the efficient management and sustainable development of the upstream petroleum sector through the provision of sustainable and internationally competitive, legislative and regulatory framework. The models are reviewed annually to take account of prevailing conditions.
Forest Act of 1998.	Law	1998	The Act is based on the concept of Community Forest Management in which community forests are established in common agreement between the concerned villages, the Forestry Department and the government. The agreements are concluded in two stages: First a Preliminary Community Forest Management Agreement is awarded which after a three- to five-year period of successful forest management may become the final Community Forest Management Agreement.

4 ENERGY EFFICIENCY POTENTIALS

There has not been any comprehensive study and/or assessment of energy efficiency potentials carried out in the country so far although with the technical and financial assistance of ECOWAS, an extensive technical diagnostics on the substitution of incandescent bulbs with compact fluorescent lamps (CFL) was undertaken in 2009. Apart from the information garnered by this diagnostic survey, information on energy efficiency in the country is very scanty and/or at best anecdotal.

Table 2: Energy Efficiency Potential in the Gambia

	Energy savings potential (GWh/year) 2013 (Reference year)	Energy savings potential (GWh/year) 2020	Energy savings potential (GWh/year) 2030
Efficient Lighting			
On-grid Household Lighting	0	25.	59
Electricity Savings for Public Street Lighting	0	0.31	2.39
Efficiency in Buildings			
Energy Saving Potential in Buildings	n.a.	10.	79
Industry			
Energy Saving Potential in Industry	n.a.	4	50
Electricity Sector			
Electricity Savings	0	22.8	177.7

n,a: Not Available

The 2009 diagnostic survey assembled very important information on the potentials for energy savings in mainly on-grid lighting. The survey estimated that 305,000 incandescent bulbs of assorted watts of 25, 40, 60 and 100 were in use by residential clients which could be substituted with CFL bulbs at an estimated cost of US\$450,040. This would translate into an electricity demand reduction of about 8.300 kW implying that a 6 MW and a 3 MW generator could be removed from generation. The study further estimated that in terms of electric energy saving, this would be equal to 1,746,600 kWh per month of 7 hours daily illumination which is equivalent to 447 tonnes of fuel. In monetary terms, this fuel saving priced at US\$48.65/barrel amount to about US\$164,000 per month.

However, due to the "one spot" nature of the result of this diagnostic survey, it is not possible to build realistically plausible targets and trajectories of the potentials for energy savings in the sectors / fields indicated in Table 2: Energy Efficiency Potential in the Gambia

	Energy savings potential (GWh/year) 2013 (Reference year)	Energy savings potential (GWh/year) 2020	Energy savings potential (GWh/year) 2030
Efficient Lighting			
On-grid Household Lighting	0	25.	59
Electricity Savings for Public Street Lighting	0	0.31	2.39
Efficiency in Buildings			
Energy Saving Potential in Buildings	n.a.	10.	79
Industry			

Energy Saving Potential in Industry	n.a.	4	50
Electricity Sector			
Electricity Savings	0	22.8	177.7

n,a: Not Available

. The energy savings potentials contained in Table 2, derived from the scenario analysis, correspond to the national targets for 2020 and 2030, and the estimated trajectories for each sector.

5 SUMMARY OF TARGETS

The status of energy efficiency in 2010 and specified targets that The Gambia intends to achieve by 2020 and 2030 as contribution to the attainment of the ECOWAS Energy Efficiency Policy targets are scanty as is evident from Tables 3 to 7 of summary of targets.

No targets have been set for energy efficiency standards and labels. The EEP targets for energy efficient lighting in terms of penetration rates of on-grid and off-grid energy efficient lights are adopted by the country. Targets for total losses in the power system have been set for high performance distribution of electricity at 31.2%, 19.9% and 10% for 2010, 2020 and 2030 respectively. Targets for the percentage of energy savings in the building sector and industry are set at 5% and 15% for each for 2020 and 2030 respectively as established by the scenario analysis.

Table 3: Targets for Energy Efficient Lighting

	2013	2020	2030
Penetration rate of on-grid, energy efficient lights (%)	0	100	100
Penetration rate of off-grid, energy efficient lights (%)	0	100	100
Percentage of public street lights that are high efficiency (%)	0	n.a.	n.a.

Table 4: Targets for High Performance Distribution of Electricity

	2013	2020	2030
Total of losses in the power system, including technical and non-technical losses, in both transmission and distribution (% of power available: generation + balance of imports and exports).	24.9	19.9	10.0

Table 5: Targets for Energy Efficiency in Buildings

	2013	2020	2030
Percentage of buildings that implement energy efficient building designs and methods	n.a.	n.a.	n.a.
Percentage of energy savings in the building sector (%)	n.a.	5%	15%

Table 6: Targets for Energy Efficiency in Industries

	2013	2020	2030
Percentage of Industries that implement energy efficiency measures (%)	n.a.	n.a.	n.a.
Percentage of energy savings in industry (%)	n.a.	5%	15%

Table 7: Targets for Improved Cookstoves*

	2013	2020	2030
Improved cookstoves (measured in terms of the % of the population/households with access to improved cookstoves)	37.9	100	100
Percentage of energy savings in industry (%)	n.a.	n.a.	n.a.

*In order to present a holistic picture of the domestic cooking energy sector, the estimated trajectory for the development of actual use of improved cookstoves is analysed along with other cooking energy fuels and technologies in sub-section 4.3.1 of the NREAP.

6 GENERAL INDICATORS

The general indicators are defined in terms of population in inhabitants, growth rate and family size for the period 2010 to 2013 as presented in Table. A cursory look at the table attracts the following observations:

- i. The population in number of inhabitants ranged from 1.64 million in 2010 to 1.88 million in 2013 reflecting an average annual increasing trend of about 0.08 million inhabitants;
- ii. The population growth rate ranged from 2.5% in 2010 to 3.3% in 2013 reflecting an average annual increasing trend of about 0.27%; and,
- iii. The family size in terms of person/housing unit ranged from 8 persons/housing unit in 2010 to 8.2 in 2013 reflecting an insignificant average annual increment of 0.07 but within the framework of an already large family size.

Table 8: General Indicators

	2010	2011	2012	2013
Population (millions of inhabitants)	1.64	1.69	1.74	1.88
Population growth rate (%)	2.5%	3%	3%	3.3%
Family size (person/housing unit)	8	8	8	8.2

6.1 MACRO-ECONOMIC INDICATORS

Table summarizes the macro-economic energy efficiency indicators for the period 2006 to 2010 and targets for the future up to 2030. In view of data paucity: primary energy intensity, final energy intensity and electricity intensity figures are available for only the period 2006 to 2009; final energy consumption per year figures are available for only the period 2006 to 2010; and, annual electricity consumption per capita/year, electricity consumption/household and electrification rate (%) targets are available for the period 2006 to 2030. The figures are derived and computed from the following sources:

Table 9: Macro-Economic Indicators

Indicator	Data from the past, where available									Trajectory for the future, where pertinent (define years)
	2006	2007	2008	2009	2010	2011	2012	2013	2030	
Primary energy intensity (Total Primary Energy Consumption/GDP) kWh/US\$ 2005 PPP	2.96	2.96	2.97	3.20	n.a	n.a.	n.a.	n.a	n.a.	
Final energy consumption per year (kWh/capita/year)	3,974.87	3,889.85	3,807.04	3,848.66	3,985.69	n.a.	n.a.	n.a	n.a.	
Annual Electricity consumption (kWh/capita/year) Future values are not targets but possible scenarios)	81.49	95.49	103.10	92.532	116.20	115.99	115.76	100.4	223.96	
Electricity intensity (final electricity consumption/GDP)	0.07	0.07	0.08	0.08	n.a.	n.a.	n.a.	n.a	n.a.	
Electrification rate (%) (the ratio between the population served and the total population of the area)	28	30	32	33	35	37	38	40	100	

The data sources are varied and include:

- i. *The primary energy intensity figures:* These are computed from the primary energy consumption figures and the GDP constant USD year 2005 purchasing power parity figures (GDP/capita x population figures). The GDP/capita figures are quoted from the World Bank Energy Sector Diagnostic Review, Government of the Republic of The Gambia, 2012, sourced from the OECD Website which unfortunately is not updated as at date. The population figures are updates from Gambia Bureau of Statistics (GBOS) population projections.
- ii. *The final energy consumption/capita/year figures:* These are calculated from the final energy consumption figures per year and the GBOS projected population figures.
- iii. *The annual electricity consumption figures/capita/year:* These are calculated from the annual aggregate final electricity consumption figures and the GBOS population figures for the period. The figure for 2030 has been obtained from the calculations
- iv. *The electricity intensity figures:* These are calculated from the annual aggregate final electricity consumption figures and the GDP constant USD year 2005 purchasing power parity figures for the period.
- v. *The figures for electrification rate:* These figures for electrification rate come from PURA records

7 NATIONAL ENERGY EFFICIENCY TARGETS AND TRAJECTORIES

In the absence of a comprehensive energy efficiency assessment in the country, no national energy efficiency targets and trajectories have been set. However, within the framework of its support to the NREAP-NEEAP-SE4ALL process in The Gambia, scenarios for the contribution of energy efficiency in the electricity and cooking sectors using the ECREEE Scenario Tool were developed. The analysis of the simulation results provides sectorial energy efficiency targets in 2020 and 2030. These targets and estimated trajectories are adopted as what The Gambia intends to achieve by 2020 and 2030 as contribution to the attainment of the EEP's targets. The sectoral categories include efficient lighting, high performance distribution of electricity, energy efficiency standards and labelling, buildings and industry.

Thus, the methodology that was used to set the baseline values and targets was scenario modelling. The simulation tool addresses electricity and cooking, encompassing electricity generation, electricity grid losses, lighting (on-grid and off-grid), buildings and industry. Two scenarios were developed: a baseline scenario representing developments that would take place in the absence of measures envisaged by the NREAP and NEEAP and a NREAP/NEEAP scenario portraying the overall, combined impacts of the plans.

The assumptions for each category and the expected trajectory between 2010, 2020 and 2030 are presented in the following:

7.1 Efficient lighting

Efficient lighting is underpinned by ten main assumptions. These assumptions include: that the population growth rate will remain constant at 3.3%/year for the entire period until 2030, that the number of persons per household will slowly decline, reaching 6 persons per household in 2030, that the population will rise up to 3.269.105 inhabitants in 2030 and, the number of households will substantially increase up to 544.851 in 2030; that the sectoral shares of final electricity consumption in 2011 will remain constant over the whole time horizon in both scenarios; that the technical and economic potential for EE measures in public street lighting is 20% (2030); that the number of off-grid lights per household of 3 and the kerosene consumption for lighting per family per year of 12 kg/household/year are assumed to stay constant over the entire time horizon; The lifetime of an off-grid lighting device is assumed to be 3 years, according to international average estimates; that the load growth is limited by the availability of supply and for the baseline scenario; and, that electricity generation will grow at an average annual rate of 10%/year while the non-served electricity demand will be gradually met over time, in alignment with the assumptions made in the WAPP master plan.

National 2020 and 2030 targets and estimated trajectories were determined for energy efficient lighting as presented in Table. These include the following: percentage of on-grid, energy efficient non-directional household lights sold per year set at 100% by 2016 right through 2030; estimate of electricity savings for on-grid household lighting (GWh/year) set at 3 GWh in 2016, 25 GWh in 2020 and 59 GWh in 2030; number of efficient on-grid lighting devices sold or distributed during the year set at 109,000 in 2016, 459,000 in 2020 and 511,000 in 2030; percentage of off-grid, energy efficient non-directional household lights sold per year set at 100% in 2016 right to 2030; estimate of kerosene savings for off-grid household lighting (thousands of kg/year) set at 129 in 2016, 732 in 2020 and 3,040 in 2030; number of off-grid lighting devices sold or distributed during the year set at 20,000 in 2016, 23,000 in 2020 and 24,000 in 2030; no targets were set for percentage of public street lights that are high efficiency; estimate of electricity savings for public street lighting (GWh/year) set at 0.04 GWh in 2016, 0.31 GWh in 2020 and 2.39 GWh in 2030; and total number of high efficiency (CFL or LED) lighting devices sold or distributed during the year set at 129,000 in 2016, 482,000 in 2020 and 535,000 in 2030.

Table 10: National 2020 and 2030 targets and estimated trajectories for lighting

	2013*	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Percentage of on-grid, energy efficient non-directional household lights sold per year **	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
– If available, estimate of electricity savings for on-grid household lighting (GWh/year) ***	0	0	3	7	12	18	25	28	30	33	36	40	43	47	51	55	59
Number of efficient on-grid lighting devices sold or distributed during the year	0	0	109,000	139,000	171,000	205,000	459,000	240,000	264,000	289,000	316,000	345,000	374,000	406,000	439,000	474,000	511,000
Percentage of off-grid, energy efficient non-directional household lights sold per year **	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
– If available, estimate of kerosene savings for off-grid household lighting (thousands of kg/year) ***	n.a.	n.a.	129	266	412	567	732	908	1,094	1,292	1,501	1,723	1,958	2,206	2,469	2,747	3,040
Number of off-grid lighting devices sold or distributed during the year	0	0	20,000	21,000	21,000	22,000	23,000	23,000	24,000	25,000	26,000	27,000	28,000	29,000	29,000	30,000	24,000
Percentage of public street lights that are high efficiency	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
– If available, estimate of electricity savings for public street lighting (GWh/year) ***	0	0.00	0.04	0.09	0.15	0.22	0.31	0.40	0.52	0.65	0.81	0.99	1.19	1.43	1.71	2.02	2.39
Total number of high efficiency (CFL or LED) lighting devices sold or distributed during the year	0	0	129,000	160,000	192,000	227,000	482,000	263,000	288,000	314,000	342,000	372,000	402,000	435,000	468,000	504,000	535,000
If pertinent, please describe any other national targets related to energy efficient lighting: please specify the target and the sector (households, commercial, etc.)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

* or the most recent year for which statistics are available

** The EEEP fixes the regional objective as the phase out of incandescent bulbs by 2020.

*** If available and feasible, please briefly describe in an annex how the electricity and/or kerosene savings (GWh/year) were calculated. If feasible, the savings should be calculated relative to a baseline scenario, i.e. the scenario that would have taken place if the energy efficient technologies in the lighting sector would not have been introduced. For example, in the case of on-grid lighting the baseline could be a mix of incandescent lamps, compact fluorescent lamps and linear fluorescent lamps, if this information is available, for instance from the UNEP-GEF en.lighten country light assessments. In the case of off-grid lighting, the baseline could be a mix of kerosene lamps, battery-powered torches and/or candles, if this information is available, for instance from the UNEP-GEF en.lighten country light assessments.

Table 71: National 2020 and 2030 targets and estimated trajectory for losses in the electricity sector

	2013*	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total percentage (%) of losses in the power system, including technical and non-technical losses, in both transmission and distribution (% of power available: generation + balance of imports and exports).	24.9	24.9	23.9	22.9	21.9	20.9	19.9	18.9	17.9	17.0	16.0	15.0	14.0	13.0	12.0	11.0	10.0
Electricity savings (in GWh/year) ***	0	0.0	3.1	6.9	11.3	16.6	22.8	30.2	38.7	48.6	60.2	73.6	89.0	106.8	127.3	150.8	177.7

* or the most recent year for which statistics are available.

** The EEEP fixes a regional target of reducing distribution losses below 10% by 2020

*** Electricity savings in GWh/year should be calculated as follows:

1. Define a scenario of total electricity demand until 2030
2. Compute the difference between the losses in GWh that would occur if the % of losses remains at the same level as in the year 2010 (or the most recent year available) and the losses in GWh that would occur if the targets set in the table are achieved (see example below).

Table 82: National 2020 and 2030 targets and estimated trajectories for energy efficiency in buildings

	2013*	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Energy saving potential in buildings (GWh)	n.a.	0	1	3	5	7	10	13	17	22	27	33	39	47	56	67	79

* Or the most recent year for which statistics are available

Table 93: National 2020 and 2030 targets and estimated trajectories for energy efficiency in industry

	2013*	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Energy saving potential (GWh)	0	0	0	0	1	3	4	7	9	12	15	19	24	29	35	42	50
Percentage of energy savings in industry (%)	0%	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%

7.2 High Performance Distribution of Electricity

Assumptions relating to this category include: the electrification rate in 2013 is estimated at 40% and in agreement with the SE4ALL targets; The Gambia will achieve universal access to electricity in 2030 in both scenarios; and, estimated reduction in household power consumption through the implementation of a national programme to disseminate high efficiency household on-grid lighting will be 40%/household (to be reached in 2020 following the targets of the EEEP).

National 2020 and 2030 targets and estimated trajectories set for high performance distribution of electricity are presented in Table 7, in terms of the following aspects: total percentage (%) of losses in the power system, including technical and non-technical losses, in both transmission and distribution (% of power available: generation + balance of imports and exports) set at 31.2% in 2010, 19.9% in 2020 and 10% in 2030; and, electricity savings (in GWh/year) set at 3.1 GWh in 2016, 22.8 GWh in 2020 and 177.7 GWh in 2030.

7.3 Energy Efficiency Standards and Labelling

No national 2020 and 2030 targets for energy efficiency standards and labelling have been set.

7.4 Buildings

Assumption relating to buildings is that in the absence of studies quantifying electricity savings potentials for The Gambia, the technical and economic potential for EE measures in buildings is 15% (2030).

National 2020 and 2030 targets and estimated trajectories were determined for buildings in terms of only energy saving potentials as presented in

Table 8. These energy saving potentials in buildings (GWh) are set at 1 GWh in 2016, 10 GWh in 2020 and 79 GWh in 2030.

7.5 Industry

Assumption relating to industry is that in the absence of studies quantifying electricity savings potentials for The Gambia, the technical and economic potential for EE measures in industry is 15% (2030).

National 2020 and 2030 targets and estimated trajectories were set for industry as presented in Table 9, in terms of two aspects: energy saving potential and percentage savings. The energy saving potential (GWh) is set at 1 in 2016, 4 in 2020 and 50 in 2030 and the percentage of energy savings in (%) is set at 1 in 2016, 5 in 2020 and 15 in 2030.

8 NATIONAL PUBLIC INSTITUTIONS INVOLVED IN NEEAP IMPLEMENTATION

Table 10 presents the national public institutions in charge of NEEAP implementation and their respective responsibilities. They include the Office of the President, MOE, MFEA, MOP, MOECCR, NAWEC, PURA, GIEPA, NEA, FD, DWR, UTG, GTTI, NARI, Women's Bureau, GBOS and GSB.

Table 104: National public institutions involved in NEEAP implementation

	National Public Institution	Responsibilities
1	The Office of the President	Final authority on the regulations, tariffs, and on contracting of any IPPs and also has responsibility for enacting forestry policies and legislations.
2	Ministry of Energy (MOE)	Responsibility for enacting policies aided by the Energy Unit (EU) and the Gambia Renewable Energy Centre (GREC). It provides support to NAWEC to provide energy related tariffs to the President.
3	The Ministry of Finance and Economic Affairs (MFEA)	Receives recommendations of PURA, evaluates the financial implications and makes recommendations to the President. Involved in the pricing of petroleum products.
4	The Ministry of Petroleum (MOP)	Oversight function for upstream and downstream activities in petroleum resources - exploration and marketing. Oversees the quality of service and safety standards within the petroleum sub-sector.
5	The Ministry of Environment, Climate Change, Water and Wildlife (MOECCWRW)	Responsibility for enacting policies related to the environment, fisheries and water resources and wildlife and serves as the line ministry for OMVG matters.
6	The National Water and Electricity Company (NAWEC)	Owns all the powers plants and operates the transmission and distribution network for the country. NAWEC is responsible for establishing and collecting electric tariffs, also establishes and administers Power Purchase Agreements (PPA) with the private power producer and implements Rural Electrification Projects.
7	The Public Utilities Regulatory Authority (PURA)	Regulates the activities of the country's public utility sectors (electricity, water and telecommunications).
8	The Gambia Investment and Export Promotion Agency (GIEPA)	Promotes investment in The Gambia by projecting its image as an investor friendly country.
9	The National Environment Agency (NEA)	Serves as the technical arm for MOECCWRW for all environment issues including environmental impact assessment of all investment programmes and projects.
10	The Forestry Department (FD)	Management of the nation's forest resources. Policy formulation and regulation. Promotes community forestry as a sustainable way to exploit forest resources for fuelwood;
11	The Department of Water Resources (DWR)	Involved in rural water supply using solar energy (renewable).
12	Department of Community Development	Promotion of substitutes and improved end-use appliances for firewood at the household level. Community training activities, research and dissemination of new and appropriate technology.
13	University of The Gambia (UTG)	Training in physics at the B.Sc. level with emphasis on energy-related courses such as solar energy, RE energy, electricity and magnetism, electro-magnetic theory and, nuclear and atomic physics.
14	Gambia Renewable Energy Centre (GREC)	To carry out adaptive research in renewable energy, development, promote the use of renewable energy and energy efficiency technologies and, advise government on renewable energy and energy efficiency.

15	Gambia Technical Training Institute (GTTI)	Research, development and training in renewable energy and energy-efficient appliances.
16	National Agricultural Research Institute (NARI)	Research, development and dissemination of renewable energy technologies, mainly biomass.
17	Women's Bureau	Advocacy for women empowerment
18	Gambia Bureau of Statistics (GBOS)	Collection, analysis and reporting of national statistics
19	The Gambia Standards Bureau (GSB)	Administering and regulating standards

Table 11 presents the number of existing national public institutions and potential institutions whose status would be revisited and/or established. There are currently 19 national public institutions that would be involved in the implementation of NEEAP. Since no new institution is envisaged to be created within the time frame of the implementation of either the NREAP or this NEEAP, this number would remain constant up to 2030 with no likelihood for a revisit of the status of any institution.

Table 11: Number of existing National public institutions and potential institutions whose status would be revisited and/or established

		2013*	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
National Public Institution existing		19	19	19	20	19	19	19	19	19	19	19	19	19	19	19	19	19
National Public Institution to revisit status		nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
National Public Institution to establish		nil	nil	nil	1	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil

9 MEASURES FOR ACHIEVING THE TARGETS

The extent to which The Gambia realizes its energy efficiency targets that it intends to achieve by 2020 and 2030 as contribution to the attainment of the targets of the EEEP will depend on the successful implementation of the measures and activities it adopts to create an enabling environment for actors. Some of the key elements of such an enabling environment include a well-conceived policy regime; a vibrant institutional, legal and regulatory framework; mechanisms for incentive planning of rules and behaviour; responsive organizational arrangements; and a well-designed regime of inducements and deterrents for individual actions. Thus, measures and activities are proposed to this effect within the following selected nine thematic areas of particular relevance to achieving the sustainable energy efficiency objectives of the country:

- Efficient lighting initiatives – four measures;
- Standards and labelling initiatives – four measures;
- Energy efficient building initiatives – five measures;
- Electricity distribution initiatives – one measure;
- Cooking initiatives – four measures;
- Energy efficiency in the industrial sector – two measures;
- Energy efficiency in the transport sector – four measures;
- Other sectors (agriculture fisheries, etc..) – three measures; and,
- Cross-cutting measures – six.

9.1 Efficient lighting initiative

As indicated in Chapter 5, some key measures undertaken as part of the concerted efficient lighting initiative by the government include: technical diagnostics on the substitution of incandescent bulbs; banning the use of incandescent bulbs in government offices and buildings; instituting an import duty waiver on energy efficient equipment; commenced substituting an estimated 305,000 incandescent bulbs of different watts with Compact Fluorescent Lamps (CFLs) in the residential sector; embarked upon a sensitization and public awareness campaign on the efficient use of electricity assisted by UNDP.

To consolidate and expand these measures within the implementation framework of the NEEAP, the following four measures and activities are designed and proposed for adoption:

9.1.1 Minimum Energy Performance Standards (MEPS)

No. 1	
Measure (title)	Adoption and Enforcement of the ECOWAS MEPS
Type of measure*	Energy Efficiency Policy
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2016 – 2018
Description of the measure	<ul style="list-style-type: none"> • Conduct national consultations with policy makers and other stakeholders on the Harmonized MEPS of on-grid and off-grid efficient lamps. • Pursue ECOWAS Process of Standardization (Ecosham). • Adopt ECOWAS Harmonised MEPS of on-grid and off-grid efficient lamps (by each ECOWAS Member Country) and publish in national official journal;.
Target group **	Equipment manufacturers, retailers, end users
Implementing body/parties	Ministry of Energy, Cabinet and National Assembly, Gambia Standards Bureau

Sector ***	Public Administration
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9.1.2 Supporting activities and policies measures

No. 2	
Measure (title)	Implementing Supporting policies and measures
Type of measure	Awareness and information, financial/fiscal
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	2008 - 2030
Description of the measure	<ul style="list-style-type: none"> • Creation of public awareness campaign of the benefits of on-grid and off-grid efficient lighting <ul style="list-style-type: none"> ○ Organize public education and awareness campaigns on the advantages and benefits of efficient lighting in national and local languages on radio and television, on posters and in newspapers, and at local events; ○ Organize special education programs for the youth in schools on the advantages and benefits of efficient lighting through radio and television programs, and posters. • Demonstrate to stakeholders the advantages and benefits of efficient lighting (compared to incandescent lamps): <ul style="list-style-type: none"> ○ Implement free distribution of on-grid and off-grid lighting products or at subsidized cost to carefully selected communities (with retrieval and destruction of replaced incandescent lamps). ○ Facilitate development of financing schemes to cover the upfront cost of on-grid and off-grid lighting products (e.g. on-bill financing). ○ Facilitate bulk procurement of on-grid and off-grid lighting products (e.g. through reducing import duties). ○ Promote installation of efficient lighting in all new social housing projects of national governments. ○ Promote LED light. • Develop and adopt fiscal instruments to reduce prices of on-grid and off-grid efficient lighting: <ul style="list-style-type: none"> ○ Conduct baseline market studies and cost-benefit analyses on on-grid and off-grid efficient lighting products in all ECOWAS countries to gather data for consultations with policy makers. ○ Conduct consultations with policy makers (including Parliamentary Select Committees) on the establishment of fiscal instruments (including incentives and reduced taxes) to reduce prices of on-grid and off-grid efficient lighting products. ○ Adopt reduced taxes (including import duties, VAT) for on-grid and off-grid efficient lighting products ○ Adopt incentive schemes (including tax holidays) to support local manufacture of on-grid and off-grid efficient lighting products.
Target group	Equipment manufacturers, retailers, end users
Implementing body/parties	Ministry of Energy, National Water and Electricity Company, NEA, other organizations/agencies.
Sector	Residential Sector and Public Administration

9.1.3 Monitoring, Verification and Enforcement

No. 3	
Measure (title)	Establish a system for Monitoring, Verification and Enforcement (MV&E) of Minimum Energy Performance Standards (MEPS) for lighting systems
Type of measure	Capacity building
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2016 - 2030
Description of the measure	<ul style="list-style-type: none"> • Establish National Registries for on-grid and off-grid lighting products <ul style="list-style-type: none"> ○ Create and make functional National Registries for lighting products ○ Create and make functional Regional Registry for lighting products ○ Collate data on lighting products – country of origin, importers, quantity, quality, technical data sheets • Monitor import/export of efficient lighting products into the Gambia (with periodic checks) & set penalties for non-compliance of standards and labelling requirements • Conduct regular census of importers, wholesalers and distributors of efficient lighting products • Conduct periodic checks on importers, wholesalers and distributors of efficient lamps – covering: <ul style="list-style-type: none"> ○ Inventory of the types of lamps on the market. ○ Verification of the presence or absence of valid labels. ○ Verification of the technical characteristics of the lamps as registered. ○ Verification of conformity to minimum energy efficiency standards on the lamps.
Target group	Public administration, retailers, end users
Implementing body/parties	Ministry of Energy and Public Utilities Regulatory Authority, Gambia Standards Bureau and Customs
Sector	Public and commercial sector

9.1.4 Environmentally sound management

No. 4	
Measure (title)	Environmentally sound management through the implementation of a collection and disposal system for energy efficient light bulbs
Type of measure	Capacity building, awareness raising/information
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2020
Description of the measure	<p>Create public awareness of the environmentally sound collection and disposal of on-grid and off-grid efficient lamps and batteries:</p> <ul style="list-style-type: none"> • Organize public education and awareness campaigns on the rationale behind and methods for environmentally sound collection and disposal of used lamps and batteries in national and local languages through radio, television, posters/leaflets, newspapers, SMS messages, at social events, markets and through celebrities • Organize special education programmes for the youth in schools <p>Conduct national consultation with policy makers and other stakeholders:</p>

	<ul style="list-style-type: none"> • Develop and adopt national regulation for environmentally sound disposal of spent efficient lamps and batteries • Apply Extended Producer Responsibility principals • Set up Collection & Recycling Service Organisations (CRSOs) <p>Conduct national consultations with utilities, selected shops, schools and other stakeholders:</p> <ul style="list-style-type: none"> • Design and develop national collection system for spent efficient lamps and batteries • Involve informal sector in spent lamps collection • Incentivise consumers and spent lamps collectors <p>Establish Collection and Recycling Service Organisations</p> <p>Develop and implement national collection system established for spent on-grid and off-grid efficient lamps and batteries</p> <ul style="list-style-type: none"> • Invite bids and select consultant for development of technical specification, design and business plan of commercially viable recycling and disposal facility for spent on-grid and off-grid efficient lamps and batteries. • Invite bids and select contractor to build and operate regional recycling and disposal facility for spent on-grid and off-grid efficient lamps and batteries. • Commission regional recycling and disposal facility(ies) for spent on-grid and off-grid efficient lamps and batteries
Target group	End users, public administration, equipment manufacturers, retailers,
Implementing body/parties	Ministry of Energy, National Environment Agency and Municipal/Area councils, NEA and Health
Sector	All sectors

9.2 Standards and labelling initiative

The government enacted a Gambia Standards Bureau Act in 2010 which established The Gambia Standards Bureau under the Ministry of Trade, Industry and Employment. Some key measures undertaken which are of relevance to the energy efficiency standards and labelling initiative include the publication of labelling of pre-packaged foods in 2013 and, the development of eleven standards which currently are on public hearing. Two of these standards are on electro-technical issues.

Within the framework of the implementation of the NEEAP, these measures will be complemented by the following four measures and activities designed and proposed for adoption for energy specific standards and labelling initiative:

9.2.1 Policies and tools

No. 1	
Measure (title)	Develop Energy Standards in line/in conformity with ECOWAS
Type of measure	Policy
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2016 - 2018
Description of the measure	<ul style="list-style-type: none"> • Conduct market assessment of key energy-using appliances: <ul style="list-style-type: none"> ○ Collection and analysis of data on pricing and sales, ○ Market penetration

	<ul style="list-style-type: none"> ○ Leading brands, ○ Baseline performance of energy-using equipment ○ Efficiency improvement potential, usage characteristics, etc. ● Impact assessment of the costs and benefits of the proposed standards: <ul style="list-style-type: none"> ○ Savings (energy and money, environmental benefits etc.) ○ Assessment of energy efficiency improvement potential for selected appliances. ● Conduct consumer research on efficiency label design options. Evaluate local/regional socio-cultural factors. ● Design and implementation of complementary policy regulatory and educational measures that support the enforcement of standards and labelling programmes
Target group	Equipment manufacturers/importers and retailers
Implementing body/parties	MOE, Public Utilities Regulatory Authority, The Gambia Standards Bureau, Gambia Technical Training Institute and Gambia Revenue Authority and Private sector
Sector	Commercial sector

9.2.2 Awareness raising

No. 2	
Measure (title)	Awareness Raising on energy-efficient appliances for national authorities, the commercial sector and the wider public
Type of measure	Awareness raising/information
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2016 – 2018
Description of the measure	<ul style="list-style-type: none"> ● Develop a concept for a communication and outreach strategy based on international experience and best practices, with a particular focus on disseminating information about the benefits of using new products instead of second-hand ones. ● Conceive and conduct awareness raising campaigns for national authorities, manufacturers, distributors, specialized professionals such as engineers and technicians and the general public. ● Create public awareness of the mandatory labels of on-grid and off-grid efficient lighting products: <ul style="list-style-type: none"> ○ Educate the public and explain the information displayed on the mandatory labels of on-grid and off-grid efficient lighting - in national and local languages on radio and television, on posters and in newspapers, and at local events. ○ Organize special training programs for relevant staff of Standards authority and Customs agency on the interpretation of the mandatory labels of on-grid and off-grid efficient lighting. ○ Organize special training programs for relevant staff of Standards authority and accredited institutions on the test methods for on-grid and off-grid efficient lighting.
Target group	Public administration, equipment manufacturers, retailers end-users
Implementing body/parties	Ministry of Energy, Public Utilities Authority and Gambia Standards Bureau
Sector	Public and commercial sector, residential sector

9.2.3 Financial/fiscal measures

No. 3	
Measure (title)	Financing for the diffusion of energy-efficient appliances
Type of measure	Financial
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2016
Description of the measure	<ul style="list-style-type: none"> Consult with political bodies and utilities on drafting incentives schemes to promote the purchase of energy-efficient appliances. Develop and introduce innovative instruments to finance energy efficient equipment. These may include customer credit schemes, demand-side-management by utilities changes to the tax system etc., to provide incentives for energy efficient products or increases in duties for inefficient products.
Target group	Public administration, equipment manufacturers, retailers end-users
Implementing body/parties	Ministry of Energy, Ministry of Finance and Economic Affairs, Public Utilities Authority and Ministry of Environment
Sector	Public sector, energy supply

9.2.4 Market assessment

No. 4	
Measure (title)	Market assessment of key-energy using appliances
Type of measure	Awareness raising/information
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2016 - 2030
Description of the measure	<p>Market Assessment:</p> <ul style="list-style-type: none"> Collection and analysis of data on pricing and sales, market penetration, leading brands, baseline performance of energy-using equipment, efficiency improvement potential, usage characteristics, etc. Collection of additional market data and baseline usage as well as performance data for selected product categories, as necessary to inform a decision on efficient performance levels for instance through field surveys (e.g. end-use metering studies) and laboratory testing.
Target group	Public administration, equipment manufacturers, retailers, end users
Implementing body/parties	Ministry of Energy, Public Utilities Regulatory Authority and National Electricity and Water Company, GBOS and Ministry of Environment
Sector	Production and Commercial sector

9.3 Energy efficient buildings initiative

Although there is an enacted Physical Planning and Development Control Act in place since 1990, no key measures have been undertaken as part of an energy efficient buildings initiative under this Act and its enabling regulations. Thus, for the purpose of implementing the energy efficient buildings initiative under the NEEAP, five sets of measures and activities are proposed for

adoption. These measures and activities are designed to focus on key policy issues, capacity building and use of local materials in construction as follows:

9.3.1 Policies and tools for energy efficiency in buildings

No. 1	
Measure (title)	Energy efficient building initiative
Type of measure	Energy efficiency building policy/tool, capacity building awareness raising information and financial and measures
Priority (from 1 to 5 whichever is the highest)	3
Existing or planned	Planned
Time frame (start year –end year)	2016 on wards
Description of the measure	<ul style="list-style-type: none"> • Establish mandatory building codes, regulations and MEPS • Introduce common general framework for the calculation of energy performance of buildings • Introduce minimum requirements to the energy performance of new buildings • Introduce minimum requirement to the energy performance of existing buildings subject to major renovation and requiring planning approval energy certification of buildings • Regular inspection of air-conditioning and water heating systems in buildings • Establish control system for energy performance certificates and inspection reports
Target group	Public administration planners, architects, equipment manufacturers, end users and contractors.
Implementing body/parties	Ministry of Energy, Public Utilities Regulatory Authority, NEA, NAWEC, Ministry of Lands and Regional Government, Ministry of Transport, Works and Infrastructure and Department of Physical Planning, Gambia Standards Bureau and Department of Community Development
Sector	Residential, commercial and public sector

9.3.2 Policies and tools on energy efficiency criteria in buildings

No. 2	
Measure (title)	Introduction of energy efficiency criteria into the national building code and establish a link to ECOWAS directive for energy efficiency in buildings (EDEEB)
Type of measure	Energy efficiency building policy/tool
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2015 – 2016
Description of the measure	<p>Develop and implement a national building code tailored to local conditions and construction practices that requires or encourages a high level of energy performance of new buildings; this should include minimum energy efficiency standards in building under the building permit procedure; criteria of tropical architecture and the link to urban planning</p> <p>The national building code should be developed in accordance with the ECOWAS Directive on Energy Efficiency in Building (EDEEB). Specifically, compatibility with the EDEEB should be ensured in at least the following aspects:</p> <ol style="list-style-type: none"> a. A common general framework to measure and calculate energy performance of buildings; b. Minimum requirements for new buildings energy performance;

	<ul style="list-style-type: none"> c. Minimum requirements for existing building energy performance subject to major renovation and requiring project approval; d. Minimum requirements for renewable energy sources used in new and existing buildings subject to major renovation and requiring project approval e. Building energy certification
Target group	End users, public administration, planners, architects and installers
Implementing body/parties	Ministry of Energy, Department of Physical Planning
Sector	Residential, commercial and public sector

9.3.3 Use of local materials and methods in construction

No. 3	
Measure (title)	Capacity building, institutional strengthening and training measures on energy efficiency for the buildings value chain
Type of measure	<i>Capacity building</i>
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2016 to 2020
Description of the measure	<ul style="list-style-type: none"> • Capacity building for building and construction authorities, for implementation and enforcement (inspection, certification) of energy efficiency criteria in building codes • Training for building professionals to comply with the energy efficiency standards in the building code, through use of bio-climatic technologies • Development of local industries to produce building materials and equipment for high efficiency buildings • Showcase bio-climatic architectural adapted to local climate conditions, through demonstration projects
Target group	Manufacturers of construction materials, architects, engineers, contractors
Implementing body/parties	Public sector, construction sector, planners, architects, engineers, installers, manufacturers of construction materials
Sector	Construction

9.3.4 Promotion of the use of local materials in construction

No. 4	
Measure (title)	Promotion of the use of local materials in construction
Type of measure	Capacity building
Priority (from 1 to 5 whichever is the highest)	3
Existing or planned	Planned
Time frame (start year –end year)	2016 - 2030
Description of the measure	<ul style="list-style-type: none"> • Development of a catalogue of local building materials in construction • Establishment of testing facilities to ensure that products comply with technical requirements • Monitoring and evaluation of demonstration buildings • Promote R&D in local building materials
Target group	Manufacturers of construction materials, architects, engineers, contractors

Implementing body/parties	Ministry of Energy, Department of Community Development and Gambia Technical Training Institute, NEA, Ministry of Lands and Regional Government and Ministry of Transport, Works and Infrastructure
Sector	Construction

9.3.5 Policies and tools on energy efficiency in buildings

No. 5	
Measure (title)	Develop and implement a system to award energy performance certificates for public buildings in the Gambia
Type of measure	Policy/tool
Priority (from 1 to 5 whichever is the highest)	3
Existing or planned	Planned
Time frame (start year –end year)	2015 – 2016
Description of the measure	<ul style="list-style-type: none"> • Development of an accreditation process to accredit bodies that will issue the energy performance certificate • Development of a standard for energy performance certificates establishing reference values such as minimum energy performance requirements for relevant building categories • Development of a national building energy performance register: Where an energy performance certificate is issued, such information contained in the energy performance certificate be required to be submitted to a national building energy performance register to be established and maintained by the pertinent authority
Target group	Manufacturers of construction materials, architects and engineers
Implementing body/parties	Ministry of Energy, Department of Community Development and Gambia Technical Training Institute, key stakeholders
Sector	Construction sector

9.4 Electricity distribution initiative

A number of important measures were adopted to incentivise energy efficiency in electricity distribution. These measures include: the introduction of pre-paid meters since 2009; rehabilitation, refurbishment and expansion of electricity Network in the Greater Banjul Area which resulted in significant loss reduction for the Utility; and, a review of the Utility's financial management system and corporate governance.

Thus, the following measure and related activities are designed to consolidate and expand these initiatives through improved management practices.

9.4.1 Improved management practices

No. 1	
Measure (title)	Introduction of improved management practices and technical measures to diminish losses in the electricity distribution system
Type of measure	Energy efficiency policy
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Existing
Time frame (start year –end year)	2000 – 2030

Description of the measure	<ul style="list-style-type: none"> • Management practices related to building and maintenance such as optimised billing and regular inspection of lines • Shortened billing cycle including thorough tools that produce a bill immediately upon meter reading • Regular inspection of lines to identify and remove illegal unsafe connections and to encourage all users to become paying customers • Regular inspection of lines for possible up-grading to reduce technical losses. • Regular preventive maintenance of all components of the distribution system in order to assure reliable power supply. This includes, notably, upgrading of lines and transformers that are operating near capacity that show signs of weakness or that are outdated and inefficient • Installation of pre-paid meters to improve bill collection and relations with clients • Installation of more transformers to reduce long distribution lines and improve power quality. • Before installation of NAWEC electrical meters, a certified individual should approve the electrical installation. • Power factor correction to reduce losses through the installation of capacitor bank on client premises where they are needed
Target group	End users, public administration, planner, installers and energy suppliers, grid operators
Implementing body/parties	MOE, National Water and Electricity Company and Public Utilities Regulatory Authority, MOFEA
Sector	Energy supply sector

9.5 Cooking initiative

A number of important measures of significant clean cooking initiative relevance have been undertaken over the years. These measures focused mainly on improved cooking systems with emphasis on modern and sustainable fuels, and more efficient cook stoves. The most recent key measure undertaken as part of the safe, affordable, clean and sustainable cooking initiative is a regional workshop organized by ECREEE and MOE in August 2014 under WACCA initiative which defined and adopted a national cooking action plan framework for The Gambia.

However, as of yet, The Gambia has not adopted any standard for improved cookstoves. ECREEE, though WACCA intends to introduce Standards and Labels for improved stoves. This means that the stoves will be rated based on efficiency tests in labs for all types of stoves. It is envisaged that the country will make sure to only rely on highly rated cookstoves, and compliance will be ensured through strict monitoring and enforcement by the concerned institutions including the Ministry of Energy (GREC), the Gambia Standards Bureau and Department of Community Development.

Thus the following four measures are designed to institutionalize the national components of the WACCA initiative:

9.5.1 Policy and regulatory framework

No. 1	
Measure (title)	Adopt and implement the national components of the WACCA initiative
Type of measure	Policy and regulatory
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2015 – 2030

Description of the measure	<ul style="list-style-type: none"> • Adopt at the national level ECOWAS-wide regional clean cooking policies, strategies and targets, including legal and regulatory mechanisms in order to reach market transformation towards modern and alternative fuels and efficient devices to reduce health and environmental impacts. • Review existing national policies and strategies where necessary, including legal and regulatory mechanisms and identify areas of adaptation. • Enhance the legal and regulatory frameworks and improve price structures for cooking fuels and devices on national and regional levels. • Support the design, production, testing, and upscale production of improved cooking fuels and devices. • Support the development of micro-enterprise clusters to foster collective efficiency and establish vertical linkages between the clusters and the distribution & supply chains for improved cook stoves. • Conduct demonstration/pilot projects on innovative and clean cooking fuels & cookstoves. • Encourage local innovation and competition on best practices on efficient, clean and safe cooking fuels and stoves.
Target group	End users, equipment manufacturers and energy suppliers
Implementing body/parties	Ministry of Energy, Department of Community Development and Renewable Energy Association of The Gambia, Department of Forestry
Sector	Public, residential, commercial

9.5.2 Gender responsive actions and economic empowerment of women

No. 3	
Measure (title)	Integration of gender aspects in national energy planning, development and implementation of gender responsive actions and measures for the economic empowerment of women
Type of measure	Capacity building
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	2015 - 2030
Description of the measure	<ul style="list-style-type: none"> • Involve women in the conceptualization development and implementation of energy policies projects and programmes. • Produce promotional messages to address the gender issue. • Develop and implement programmes to train young women to produce and sell clean cookstoves, produce more efficient charcoal and sustainably manage forest as well as involve them in other parts of the cooking energy value chains. • Capacity building of policy makers and practitioners to integrate gender in their cooking energy policies and programmes. • Integration of gender indicators in studies. • Conduct gender analysis of business models to evaluate economic implications for women in the value chain as well as social benefits and barriers for women related to different production modes. • Develop practical guidelines for mapping gender in the cooking energy value chains.
Target group	Policy makers, women
Implementing body/parties	Ministry of Energy, Women's Bureau and Media
Sector	Public and Private sectors

9.5.3 Specific measures for the promotion of efficient cook-stoves

No. 4	
Measure (title)	Promotion and widespread dissemination of efficient cookstoves in the Gambia
Type of measure	Capacity building
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Existing
Time frame (start year –end year)	1982 – 2020
Description of the measure	<ul style="list-style-type: none"> • Promotion measures: <ul style="list-style-type: none"> ○ Develop capacity building manuals on various aspects of clean cooking fuels and devices. ○ Support the identification of pioneer producers willing to manufacture improved cook-stoves and assist them in producing the new models. Pioneer producers can later on be used as trainers of other producers and could benefit from innovations and promotional support. Arrangements with pioneer producers should however leave enough room to other production units to undertake large-scale dissemination in future. ○ Develop and implement programmes for training of trainers and replicate in other regions. ○ Develop and implement programmes for male and female stove producers on business development. ○ Develop and implement programmes for training for improved stoves in productive use (building on the model of UNIDO for cluster development, bio-char and other innovative stoves). ○ Develop and implement programmes to train entrepreneurs on how to improve quality of products, better understand consumer preferences and incorporate feedback, attract investment, market their products and keep financial records. ○ Develop and implement programmes for training and capacity reinforcement of private operator research institutions, NGOs, village associations, women groups and female entrepreneurs and consumer associations. ○ Develop and implement programmes to support the training and education of women entrepreneurs that can become engaged and employed through the value chain leading to increase success of cook-stove businesses. ○ Capacity building for local enterprise development along the value chain through individual organizations women’s networks or via regional knowledge and training centres. ○ Develop and implement strategies to expand distribution improved cookstoves, for instance by adding improved cookstoves and fuels to large non-cooking product distribution/wholesale network and improve existing cookstove and fuel-specific distribution networks to ensure consumer access ○ Support the development of the technical research and training capacity within the humanitarian settings • Introduce programmes to enhance access to finance mobilise private investment and encourage involvement of the private sector and banks in funding sustainable cooking energy investment projects; and, • To develop and implement independent and efficient monitoring, verification and enforcement mechanisms for the use of clean and efficient cookstoves. • Use Technical Training Institutions’ capacity to teach, train and produce efficient stoves.
Target group	Investors, end users, public administration, planners, installers, equipment manufacturers, retailers and women

Implementing body/parties	Department of Community Development, Gambia Technical Training Institute, Renewable Energy Association of The Gambia, TANGO, WB and Media
Sector	Public and commercial sector, academia

9.5.4 Specific measures for the use of energy efficient fish smoking kilns for artisanal fish smoking

No. 8	
Measure (title)	Promotion of the use of energy efficient fish smoking kilns for artisanal fish smoking
Type of measure	Capacity building
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2020
Description of the measure	<ul style="list-style-type: none"> • Demonstration of energy efficient fish smoking kilns in local communities; adapt the improved kilns to local conditions and materials. • Provide training for the construction, use and maintenance of the improved fish smoking kilns. • Introduce local production of improved fish smoking kilns. • Produce training and information material in order to promote the introduction of improved kilns/ovens. • Ensure the widespread dissemination of energy efficient fish smoking kilns in fish smoking communities. • Promote the creation of social enterprises in order to promote the dissemination of efficient kilns. • Transfer of skill on building energy efficient fish smoking ovens to the unemployed youth in the target communities along with facilitation of the adoption and utilization of these energy- saving technologies by women. • Explore the use of solar fish driers. • Communication activities to raise awareness on wetland values and functions. • Build capacity on wetland conservation and disseminate good practices from existing community-based management programmes in other West African countries.
Target group	Fish smokers, wood fuel traders, end users
Implementing body/parties	Department of Community Development, Department of Fisheries, Department of Forestry NGOs, NEA, WB and Media
Sector	Fisheries

9.6 Energy efficiency in the industrial sector

No key measures of energy efficiency relevance have been undertaken in the industrial sector in spite of its importance as a major energy consumer in the economy. Thus, within the framework of implementation of the NEEAP to contribute to the achievement of the regional targets set in the EEEP, the following two measures are proposed for adoption:

9.6.1 Energy efficiency policies and tools

No. 1	
Measure (title)	National programs to implement an ISO-compatible Energy Management Standard (EnMS) for Industry (ISO 50001)
Type of measure	Energy efficiency policy
Priority (from 1 to 5 whichever is	2

the highest)	
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2020
Description of the measure	<ul style="list-style-type: none"> • Develop and implement a national Energy Management Standard compatible with ISO 50001 in the Gambia <ul style="list-style-type: none"> ○ Conduct national stakeholder consultations for the development of an EnMS for industry in the Gambia • Implement pilot Energy Management System and System Optimization in industrial facilities <ul style="list-style-type: none"> ○ Develop energy management benchmarking and award programmes • Develop and implement measurement and verification of compliance with Energy Management Systems (EnMS) <ul style="list-style-type: none"> ○ Create capacity within relevant organizations to develop and implement a M&V programme of compliance with EnMS <ul style="list-style-type: none"> ○ Establish a recognition scheme for EnMS experts and organizations and companies compliant with ISO 50001 ○ Launch accreditation programme for Energy Management System (EnMS) in accordance with the ISO 50001 Standard ○ Establish (voluntary) reporting programmes on energy use in industry • Introduce best-practice information dissemination and recognition programmes for industrial energy efficiency
Target group	Standards authority, industry, policy makers
Implementing body/parties	Ministry of Energy, Gambia Chamber of Commerce and Industry, The Gambia Standards Bureau, Ministry of Trade and Industry, Regional Integration and Employment and, PURA
Sector	Industry sector

9.6.2 Demand side management (three variances)

No 2	1
Measure (title)	Introduction of improved management practices and technical measures to diminish losses in the electricity distribution system
Type of measure*	Energy efficiency policy
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2015 to 2025
Description of the measure	<ul style="list-style-type: none"> • Management practices related to billing and maintenance, such as optimised billing and regular inspection of lines • Shortened billing cycle, including thorough tools that produce a bill immediately upon meter reading • Regular inspection of lines to identify and remove illegal, unsafe connections, and to encourage all users to become paying customers • Regular preventive maintenance of all components of the distribution system in order to assure reliable power supply. This includes, notably, upgrading of lines and transformers that are operating near capacity that show signs of weakness or that are outdated and inefficient • Installation of pre-paid meters to improve bill collection and relations with

	<p>clients</p> <ul style="list-style-type: none"> • Installation of high voltage distribution systems that improve power quality and reduce theft • Power factor correction to reduce losses through the installation of capacitor banks on client premises where they are needed. The introduction of power factor
Target group	<i>end users, public administration, planners, installers, energy suppliers</i>
Implementing body/parties	Ministry of Energy, Ministry of Finance and Economic Affairs and Gambia Chamber of Commerce and Industry and NAWEC

No. 3	
Measure (title)	Development and implementation of demand side management (DSM) in the electricity sector
Type of measure	Energy efficiency policy
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2015 -2016
Description of the measure	<ul style="list-style-type: none"> • Development of improved methods for cost-benefit analysis of DSM and for incorporating DSM into integrated resource planning by electricity suppliers • Regulatory mechanisms (e.g. Energy Efficiency obligations) • Demand response programmes providing incentive payments to customers • Good practice and experience exchange between TSOs/DSOs • Capacity building programmes for TSOs/DSOs on demand side management
Target group	Industrial users, end users, public administration
Implementing body/parties	Ministry of Energy, Ministry of Finance and Economic Affairs and Gambia Chamber of Commerce and Industry and NAWEC
Sector	Industry sector

No. 3	Introduction of power factor charges
Measure (title)	
Type of measure	Energy efficiency policy
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2015 -2020
Description of the measure	The power factor charge is an adjustment to the demand charge if the customer's power factor is less than 0.95 or 95%. This fee would be charged to industrial electricity users to recover costs for maintaining a good power factor in the electricity distribution system. This measure shall encourage industrial customers to install power factor correction (e.g. capacitor banks) or to install industrial equipment with a better (higher) power factor (e.g. motors with an adjustable speed drive).
Target group	Industrial users, public administration
Implementing body/parties	Ministry of Energy, Ministry of Finance and Economic Affairs and Gambia Chamber of Commerce and Industry and NAWEC
Sector	Industry sector

9.7 Energy efficiency in the transport sector

No key measures of energy efficiency relevance have been planned or undertaken in the transport sector. Therefore, given the importance of the share of the sector in the final energy consumption, the realization of a sustainable energy efficiency mechanism in this sector will be a significant factor in the NEEAP's contribution to the achievement of the regional targets set in the EEEP. In this regard, the following four measures are deemed appropriate for the creation of such a mechanism in The Gambia.

9.7.1 Energy efficiency policies and tools

No. 1	
Measure (title)	Implement mandatory vehicle fuel-efficiency standards and regulations on the import of used vehicles
Type of measure	policy
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2018
Description of the measure	Standards: <ul style="list-style-type: none"> • Conduct national consultation with policy makers and other stakeholders • Pursue ECOWAS Process of standardisation (Ecosham) • Adopt ECOWAS Harmonised standards on fuel-efficient vehicle and publish them in national official journal • Set up a national standards and labelling technical committee Import regulations: <ul style="list-style-type: none"> • Develop and implement regulation on the import of vehicles, prohibiting the import of more than age limit cars, busses and trucks. • Impose extra levies on inefficient vehicles used to cross-subsidize more efficient vehicles. • Gambia Standards Bureau to set up a National Standards and Labelling Committee.
Target group	Public administration, end users
Implementing body/parties	Ministry of Works, Transport and Infrastructure, Customs, Transport Union/Civil society group, standards authority
Sector	Transport sector

9.7.2 Modernization of national transport fleet

No. 2	
Measure (title)	Modernization of the national vehicle fleet
Type of measure	Financial
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2016 – 2018
Description of the measure	<ul style="list-style-type: none"> • Assessment of the state of the national vehicle fleet (age, vehicle condition energy consumption) as well as the need for new more efficient and less

	<p>polluting vehicles</p> <ul style="list-style-type: none"> • Develop/adopt and enforce public procurement guidelines for the acquisition of low-consumption vehicles in the public sector • Develop a financing plan for the purchase of new public vehicles • Prioritize vehicles to be replaced and continuously replace inefficient vehicles with new ones. • Government to mainstream energy efficiency in vehicle procurement and good road worthness..
Target group	Investors, public administration public fleet companies
Implementing body/parties	Ministry of Works, Transport and Infrastructure, MOE,NEA and Ministries of Justice and Finance.
Sector	Transport sector

9.7.3 Specific measures to reduce energy consumption in individual transport

No. 3	
Measure (title)	Reduce energy consumption in individual transport through expansion of public transport systems and services
Type of measure	Financial information
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	1974 – 2020
Description of the measure	<ul style="list-style-type: none"> • Expand bus lines to areas that have not yet been served by public transport and whose inhabitants have high mobility needs • Improve public transport services: provide air-conditioned buses, real time information at stops online information on travel schedule • Mark separate bus lanes in cities to speed up bus travels of waiting times for public transport by expanding the number of buses or trains
Target group	bus companies, end users
Implementing body/parties	Ministry of Works Transport and Infrastructure, Ministry of Finance and Economic Affairs and Municipal/Area Councils
Sector	Transport sector

9.7.4 Specific measures to enhance sustainable mobility modes

No. 4	
Measure (title)	Enhancing sustainable mobility modes through infrastructure improvement
Type of measure	Financial, information, awareness raising
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	1995 - 2020
Description of the measure	<ul style="list-style-type: none"> • Improve public transport infrastructure such as construction of designated waiting booths with electric lighting, park and ride and bike and ride schemes • Improve safety of pedestrians and cyclists through marking cycling paths in cities and constructing /maintaining sidewalks • Mark separate bus lanes in cities to speed up bus travels. • Combine infrastructural measures with awareness raising measures e.g. to

	promote cycling or walking for short distances instead of car use.
Target group	Investors, public administration, transport companies, end users, Gambia Transport Service Company
Implementing body/parties	Ministry of Works and Communication, Ministry of Finance and Economic Affairs and Gambia Public Transport Corporation
Sector	Transport sector

9.8 Other sectors

In spite of the huge potentials for production and productivity increases in the deployment of energy efficient technologies, few energy efficiency-related measures have been undertaken so far. One key measure of energy efficiency relevance undertaken has been implemented in agriculture. The Ministry of Agriculture with the financial assistance of the International Fund for Agricultural Development (IFAD) has just elaborated a ten-year National Rice Development Strategy which envisages the deployment of solar resources to minimize the use of petroleum-based rice irrigation pumps.

The following three measures are proposed for adoption in anticipation of the sectors' consumer category status:

9.8.1 Measures to enhance the fuel wood value chain nexus to major food production systems

No. 1	
Measure (title)	Improving the efficiency and sustainability of the energy value chain through participatory and sustainable forest management (PSFM)
Type of measure	Capacity building, awareness raising and advocacy
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	1989 - 2020
Description of the measure	<ul style="list-style-type: none"> • Establish a monitoring system for the fuel wood value chain in order to prevent uncontrolled deforestation and guarantee sustainable forest management • Strengthen and expand PSFM in production forest areas: support the development of strategic partnerships and collaborative arrangement with national institutions and Non-Profit Associations, regional and international agencies. • Ensure community engagement in PSFM an village livelihood development • Pilot forest landscape management: develop methodologies and frameworks for forest landscape management • Enable a legal and regulatory environment (especially forest law) • Revitalise the Village Woodlot concept initiated in 1980 to enhance supply of fuel wood for cooking and fish smoking • Expand agro-forestry through improved supply of seedlings
Target group	Forest owners and managers, end users
Implementing body/parties	Ministries of Agriculture, Energy and, Fisheries and Water Resources, Department of Forestry, National Environment Agency and villages
Sector	Forestry sector

9.8.2 Enhance the knowledge of the health nexus to the energy sector

No. 2	
Measure (title)	Set up information Raising & Capacity Building programmes in the Nexus between renewable energy/energy efficiency and the health care sector

Type of measure	Capacity building and awareness raising
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2016
Description of the measure	<ul style="list-style-type: none"> Disseminate information about the successful implementation and the economic and environmental benefit of retro-fitting hospitals with solar-based technologies; this will help increase confidence of local governments and lead to further replication in nearby villages. RE sources could provide alternate sources of energy for emergency services during power shortages. Plan regular training and information sessions to provide system designers and field technicians with the latest know-how and skills. Equip hospitals with solar energy technologies (e.g. solar photovoltaic power plant solar water heating installations a sector-powered vaccine refrigerator) and efficient light bulbs (replacement of regular light bulbs with compact fluorescent light (CFLs) and ceiling fans. Solar-based radio and radiotelephone communications (facilitate emergency medical treatment and provide reliable communications to other health clinics and facilities in the region). Enable medical appliances to operate with RES (incorporate inverters that are powered by RE into the system). Sterilization: sterilize with thermal energy rather than electricity due to lower costs. Water supply: RE-powered manual and large-motor generator driven pumps.
Target group	Health sector representatives, planners, architects, installers, equipment manufacturers, end users
Implementing body/parties	Ministries of health and Energy and Renewable Energy Association of The Gambia and The Gambia Technical Training Institute
Sector	Health and Energy sector

9.8.3 Expand use of RES for improved agricultural productivity and production and, enhanced food security

No. 3	
Measure (title)	Pursue an active cross-sector and international coordination of the multiple uses of water resources
Type of measure	Energy efficiency policy/tool,, capacity building and awareness raising
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Planned
Time frame (start year –end year)	2015 – 2020
Description of the measure	<ul style="list-style-type: none"> Set up a permanent dialogue process among stakeholders responsible for long term strategies and planning of different water uses Actively participate in river basin scale policy dialogues on water and water-centred regional dialogues with neighbouring countries with which the country shares river basins Improve understanding and systematic analysis of dynamic cross-sectoral interdependencies and the growing demand for water, energy, land resources and agriculture Promote the use of photovoltaic water pumps, including irrigation systems using both surface and underground water resources Reduce the use of non-renewable energy in agro-food system by using agricultural wastes and solar energy to produce the energy needed for the food

	processing <ul style="list-style-type: none"> • Promote the use of animal waste and manure for biogas production • Promote rainwater harvesting micro-irrigation and groundwater re-charge schemes in order to make irrigation of crops more energy and water efficient • Support the development of energy recovery from wastewater which can reduce the energy demand in the water treatment plant or even allow for export of excess energy to the power grid • Expand the use of RES for improved agricultural productivity and production and enhance food security
Target group	Investors, public administration, planners, architects, installers, equipment manufacturers, end users,
Implementing body/parties	Ministries of Agriculture, Energy and, Fisheries and Water Resources and National Environment Agency.
Sector	Agriculture, Forestry, Food Security, Energy and Water Resources

9.9 Cross-cutting measures

A number of significant cross-cutting measures of energy efficiency relevance have been undertaken. These include: the establishment of the Gambia Renewable Energy Centre (GREC) in MOE; the conduct of training in the Design, Installation and Maintenance of stand-alone systems in 2012 and the conduct of RE Curriculum Development training in 2014 by the GEF/UNIDO Project under MOE; and, the introduction of a one-year basic RE certificate programme by the Gambia Technical Training Institute (GTTI) with support from GEF5.

Thus, within the framework of an effective implementation of the NEEAP to contribute to the achievement of the regional targets set in the EEEP, the following six measures are proposed for adoption:

9.9.1 Set-up a monitoring and evaluation system for energy efficiency activities

No. 1	
Measure (title)	Monitoring, Enforcement and Evaluation of energy efficiency activities
Type of measure	Monitoring
Priority (from 1 to 5 whichever is the highest)	1
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2018
Description of the measure	<ul style="list-style-type: none"> • Develop a monitoring and evaluation system for energy efficiency activities within the Ministry of Energy • Develop a performance tracking scheme to monitor and evaluate energy efficiency activities • Implement the tracking scheme on a routine basis • Penalize defaulters of energy efficiency actions
Target group	Policy makers, public administration and Private Sector
Implementing body/parties	Ministry of Energy and other relevant stakeholders
Sector	Public and Private sectors

9.9.2 Establishment of a data and information system

No. 2	
Measure (title)	Establishment of a data and information system
Type of measure	Information and data processing
Priority (from 1 to 5 whichever is	2

the highest)	
Existing or planned	Planned
Time frame (start year –end year)	2015 - 2016
Description of the measure	<ul style="list-style-type: none"> • Establish strong data base unit in the Ministry of Energy • Equip the unit with appropriate capacities • Define the indicators and collect, analyse and store the data in the data base • Carry out yearly data validation exercise nationwide • Develop inter-departmental link with Gambia Bureau of Statistics and other data units in the administration and relevant NGOs and CSOs
Target group	Policy makers, public administration
Implementing body/parties	Ministry of Energy and other relevant stakeholders
Sector	Public and Private sectors

9.9.3 Research and Development

No. 3	
Measure (title)	Strengthening Research and Development (R&D)
Type of measure	Energy efficiency policy/tool, capacity building, research and development
Priority (from 1 to 5 whichever is the highest)	3
Existing or planned	Existing
Time frame (start year –end year)	1987 - 2020
Description of the measure	<ul style="list-style-type: none"> • Revitalise the Gambia Renewable Energy Centre of the Ministry of Energy • Strengthen other R&D institutions for energy efficiency advancement • Adopt and promote new energy efficiency programmes for future researchers
Target group	Policy makers, public administration, universities
Implementing body/parties	Ministry of Energy, UTG and other relevant stakeholders
Sector	Research and Development, academia

9.9.4 Public awareness campaign on energy efficiency

No. 4	
Measure (title)	Awareness raising campaigns on energy efficiency
Type of measure	Awareness and advocacy
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	2008 – 2018
Description of the measure	<ul style="list-style-type: none"> • Inclusion of information/training/EE subjects/informational activities in school curricula and at the local area. This is important because (a) it raises awareness of the benefits of efficient energy use with current and future energy users, and (b) it ensures that future decision-makers and professionals will pay due attention to energy efficiency • Awareness raising and advocacy measures targeting specific groups (e.g. consumers (male/female), decision makers, specific professional groups like installers, architects, engineers, technicians, local administration, energy utilities etc.) • Development of websites with information on energy efficient products and practices • Development of movie documentaries and/or TV spots, radio messages and

	<p>cartoons that inform the viewer about energy efficiency</p> <ul style="list-style-type: none"> • Distribution of brochures/leaflets and posters or advertisement in public areas • Holding of “Energy Efficiency Exhibitions ” at the national level • Include energy efficiency activities in school programmes
Target group	Different target groups including children and general public
Implementing body/parties	Ministry of Energy, National Water and Electricity Company, donor partners and both Education Ministries
Sector	All sectors

9.9.5 Specific measures for the production of seedlings for biomass fuels

No. 5	
Measure (title)	Promote the selection and dissemination of adequate tree species for biomass fuels
Type of measure	Capacity building
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	1980 – 2020
Description of the measure	<ul style="list-style-type: none"> • Produce, publish and disseminate a compilation of Gambia tree species and their uses. • Support research on the harvesting of mangroves for firewood fish smoking and their removal in the context of artisanal salt mining activities. • Support research on plantation (human-made) forest with a focus on tree species that are most relevant for the Gambia context. • Conduct research and demonstration programmes planting and experimenting with native species especially those that have high economic value in communities.
Target group	Communities, forest owner/managers policy makers
Implementing body/parties	Department of Forestry and NGOs
Sector	Forestry & Agriculture

9.9.6 Capacity building

No. 6	
Measure (title)	Building capacity among national standards bodies and other stakeholders
Type of measure	Capacity building
Priority (from 1 to 5 whichever is the highest)	2
Existing or planned	Existing
Time frame (start year –end year)	On-going
Description of the measure	<p>Capacity building</p> <ul style="list-style-type: none"> • Training and informational workshops to educate and build capacity among stakeholders: <ul style="list-style-type: none"> ○ Training workshops to build capacity on standards and labelling in the national standards bodies and energy authorities. ○ Training workshops in certification procedures compliance monitoring and enforcement programs. ○ Training of importers, retailers and other relevant stakeholders such that they actively support the initiative • Strengthen and enhance national institutions, institutions must have a mandate and adequate budget, well-trained staff and sufficient resources to effectively oversee

	<p>the development and implementation of the programmes. In this context the cooperation between energy authorities and authorities in charge of standards shall be strengthened.</p> <ul style="list-style-type: none"> • Develop capacity-building materials for S&L program managers and stakeholders • Capacity building for building and construction authorities for implementation and enforcement (inspection certification) of energy efficiency criteria in building codes • Training for building professionals to comply with the energy efficiency standards in the building code, through use of bio-climatic technologies • Carry out public education and sensitization campaigns on charcoal production through gender-based knowledge products. • Energy Management Systems (EnMS) Expert Training • System Optimization (SO) Expert Training (steam, pumps compressed air etc.) • Development and provision of tools to assist industry in developing and implementing EnMS and system optimization projects • Training of industry energy managers and engineers • Mainstream education and training in energy efficiency in the Ministries programmes.'
Target group	Public administration, equipment manufacturers, retailer
Implementing body/parties	Ministry of Energy, Gambia Technical Training Institute, NEA, NAWEC, Ministry of Lands and Regional Government, Gambia Standards Bureau, Ministry of Works, Transport and Infrastructure Department of Forestry, Gambia Chamber of Commerce and Industry and GAM Petroleum
Sector	all

9.10 Main Energy Efficiency sub-Programmes

Six main energy efficiency sub-programmes are identifiable. These are efficient lighting, electricity distribution, standards & labelling, energy efficiency in buildings, energy efficiency in industry, energy efficiency crosscutting issues and improved cookstoves.

Except for improved cookstoves, the estimation of an indicative budget for each main energy efficiency sub-programme is based on the scenario annual investment estimate for each sub-programme summed up over the period for which annual investment occurred. For improved cookstoves the 2013 base year assumption of 10 Euro per family multiplied by number of family users per year summed over the period 2013/2030 is used as an indicative budget for the sub-programme. It has not been possible to drive any estimated budget for Standards & Labelling and Energy Efficiency Crosscutting Issues sub-programmes.

9.10.1 Estimated Sub-programme Budget

Item	Sub-Programme	Description	Budget (in 000,000 Euro)
1	Efficient lighting	Total annual cost (investment) in incandescent light bulbs and low-consumption light bulbs for domestic and public street lighting for the period 2016/2030	13.5
2	Electricity distribution	Total annual cost (investment) of scenario with measures to reduce grid losses in the period 2016/2030	100
3	Standards & Labeling		n.a.
4	Energy efficiency in buildings	Total annual cost (investment) of scenario with measures to improve the energy performance of buildings in the period 2016/2030	82
5	Energy Efficiency in Industry	Total annual cost (investment) of scenario with measures to improve EE in industry in the period 2016/2030	78
6	Energy Efficiency Crosscutting issues		n.a.
7	Improved Cookstoves	Total annual cost of improved stove/family times number of families/year summed over the period 2013/2030	49.61

10 ARTICULATION WITH REGIONAL INITIATIVES

The ECOWAS region has a series of on-going regional policies and initiatives in the field of energy efficiency:

- The ECOWAS Energy Efficiency Policy (EEEP)
- ECOWAS Energy Efficiency Programme (SEEA-WA);
- The West Africa Clean Cooking Alliance (WACCA)
- The ECOWAS Programme on Gender Mainstreaming in Energy Access (ECOW-GEN)
- The ECOWAS Solar Thermal Programme
- Specific EE Initiatives
 - Standards and Labelling Initiative
 - Efficient Lighting Initiative
 - Energy Efficiency in Buildings Initiative
 - High Performance of Distribution of Electricity Initiative
 - Safe, Sustainable and Clean Cooking Initiative

A summary of these regional initiatives can be found in Annex II of this Plan.

Synergies between these programmes and the proposed measures in this plan will be exploited and the country will actively participate in the regional initiatives.

11 PREPARATION OF THE NATIONAL ENERGY EFFICIENCY ACTION PLAN

(a) Public Consultation

The public consultation carried out for the preparation of this National Energy Efficiency Action Plan took the form of a national Kick-Off Meeting at the inception of the process and subsequently a National Review and Validation Workshop of the Baseline Report of the consultant.

(b) Stakeholders involved

The following matrix presents the list of key stakeholders institutions and their representatives on the national Steering Committee for the preparation of this National Energy Efficiency Action Plan:

Stakeholders Institution	Name of Representative(s)
Ministry of Energy (MOE)	Messrs. Kemo K. Ceesay, Babucarr Bittaye, Bafoday Sanyang and Lamin Marong
Department of Community Development	Mrs. Mama Janneh Sawaneh
Women's Bureau	Mrs. Ndye Fatou Jobe Sanyang
National Environment Agency	Mr. Malick Bah
Gambia Investment and Export Promotion Agency	Mr. Abdoulie Hydra
National Water and Electrical Company (NAWEC)	Messrs. Ousman Njie and Lang Sabally
Renewable Energy Association of the Gambia (REAGAM)	Mr. Chris Dean
Public Utility and Regulatory Authority (PURA)	Mr. Matarr Touray
United Nations Development Program (UNDP)	Dr. Almamy Camara

12 IMPLEMENTATION AND MONITORING OF THE IMPLEMENTATION OF THE NATIONAL EFFICIENCY ENERGY ACTION PLAN

- a) The national authority for the follow-up of the National Energy Efficiency Action Plan is the Ministry of Energy.
- b) A monitoring system, including indicators for individual measures and instruments, to follow-up the implementation of the National Energy Efficiency Action Plan (NEEAP) will be developed in due course with support from ECREEE. The development of the M&V system for energy efficiency will include the following actions, among others:
 - a. Development of a monitoring and evaluation system for energy efficiency activities within the Ministry of Energy
 - b. Develop a performance tracking scheme to monitor and evaluate energy efficiency activities
 - c. Implement the tracking scheme on a routine basis
- c) Regional/local energy efficiency strategies are an important component of the NEEAP. Specifically, initiatives to pursue access of rural and urban communities to modern cooking fuels, improved cookstoves and efficient and sustainable charcoal production will be pursued, as described in the NREAP. In doing so, communities will be empowered to shape and implement measures and programmes.

ANNEX I – Definition of Terms Used in the NEEAP

The terms described here have been organised alphabetically.

Bagasse: the fuel obtained from the fibre which remains after juice extraction in sugar processing

Biomass: biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste. The uses of biomass for energy are very diverse: from the traditional, low-efficiency burning of wood in open fires for cooking purposes to the more modern use of wood pellets for the production of power and heat, and the use of biodiesel and bioethanol as a substitute for oil-based products in transport.

Building: a roofed construction having walls, for which energy is used to condition the indoor climate; a building may refer to the building as a whole or parts thereof that have been designed or altered to be used separately; buildings' definition includes individual houses and multi-family houses, commercial buildings, public buildings.

Building envelope: it includes walls, roof, the bottom floor, windows, doors, all the elements that limits the inside and the outside of the building.

CFL: Compact Fluorescent Lamp

Charcoal: The solid residue from the carbonisation of wood or other vegetal matter through pyrolysis. The amount of biomass (usually fuelwood) necessary to yield a given quantity of charcoal depends mostly on three factors:

- Parent wood density – the principal factor in determining the yield of charcoal from fuelwood is parent wood density, since the weight of charcoal can vary by a factor of 2 for equal volumes
- Moisture content - moisture content of the wood also has an appreciable effect on yields - the drier the wood, the greater is the yield - ; and
- The means of charcoal production: charcoal is produced in earth-covered pits, in oil drums, in brick or steel kilns and in retorts. The less sophisticated means of production generally involve loss of powdered charcoal (fines), incomplete carbonization of the fuelwood and combustion of part of the charcoal product, resulting in lower yields.

Traditional non-efficient charcoal production methods: traditional charcoal production methods include open pits, oil drums and kilns with lower efficiencies. In the ECOWAS charcoal is mainly produced by traditional methods in the informal sector (e.g. open pits and kilns) which are inefficient (60-80% of the energy in the wood is lost) and has impacts on the health and on the environment.

Efficient charcoal production: efficient charcoal is the terminology used on this template for the charcoal produced by modern methods that are more efficient than traditional ones. The modern methods use sealed containers and have higher efficiencies and thus higher yields. Within the EREP, under the targets for domestic cooking, a target for efficient charcoal production is set: 60%/100% of the charcoal production should be by improved carbonisation techniques (yield >25% in 2020 and 2030, respectively). In this template the MS is asked to set out its target and trajectory for efficient charcoal production. This is calculated by dividing the quantity of charcoal produced by improved carbonisation techniques with yield superior to 25% in tonnes by the total charcoal production in tonnes.

Cogeneration (also known as combined heat and power) is the simultaneous production of electricity and process heat from a single dynamic plant.

CRSO: Collection & Recycling Service Organisations

Energy efficiency: It means the ratio of output of performance, service, goods or energy, to input of energy

Energy performance of a building: the amount of energy actually consumed or estimated to meet the different needs associated with a standardised use of the building, which may include, inter alia, water heating, cooling, ventilation, use of daylight, shadowing systems and components, as well as electricity consumption for lighting and other uses as computer, domestic appliances, etc. This amount shall be reflected in one or more numeric indicators which have been calculated, taking into account insulation, technical and installation characteristics, design and positioning in relation to climatic aspects, solar exposure and influence of neighbouring structures, own-energy generation and other factors, including indoor climate, that influence the energy demand;

Energy savings: means an amount of saved energy determined by measuring and/or estimating consumption before and after implementation of an energy efficiency improvement measure, whilst ensuring normalisation for external conditions that affect energy consumption

Energy efficiency: is a multidisciplinary concept which aims to increase energy savings from upstream to downstream in the energy chain. It is energy efficient to reduce energy consumption for the same type of product or service.

Energy service: it means the physical benefit, utility or good derived from a combination of energy with energy-efficient technology or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to result in verifiable and measurable or estimable energy efficiency improvement or primary energy savings

EEEP: ECOWAS Energy Efficiency Policy

Energy Intensity: energy efficiency means the ratio of energy use to economic output of goods and services. Energy intensity is generally considered to be a good macro-economic indicator of energy efficiency. It can be calculated for an entire nation, or for specific economic sectors. The unit of energy intensity is an energy unit divided by a currency value, for instance:

toe/GDP at year 2005 USD at purchasing power parity.

EREP: ECOWAS Renewable Energy Policy

Primary energy intensity: is the ratio between the Total Primary Energy Supply (TPES) and the Gross Domestic Product (GDP) calculated for a calendar year. The gross inland consumption of energy is calculated as the sum of the gross inland consumption of the different sources of energy. To monitor trends, GDP is in constant prices to avoid the impact of inflation, base year 2005.

EnMS: Energy Management System

Energy saving performance contracts (ESPCs): An energy savings performance contract is an agreement between a building owner and an energy services company (ESCO) for the identification, evaluation, recommendation, design and construction of energy conservation measures, including a design-build contract, that guarantee energy savings or performance.

Energy Service Company (ESCO): The ESCO approach combines a financial service with technical services, thus simplifying energy savings for the user, by:

- Choosing energy efficiency measures adapted to the user's needs;
- Financing the purchase of necessary equipment;
- Installing the equipment;
- In some cases, operating and maintaining the equipment;
- Measuring the energy savings achieved, and billing the customer for a part of the savings.

Final Energy Consumption: is the total energy consumed by end users, such as households, industry and agriculture. It is the energy which reaches the final consumer's door and excludes that which is used by the energy sector itself. This includes electricity and fuels (such as oil, gas, coal, woodfuel etc.).

GDP: Gross Domestic Product. To monitor trends, GDP is in constant prices to avoid the impact of inflation, base year 2005.

Gigawatt-hour (GWh): 1,000,000,000 watt-hours.

Import and export: Import and export comprise quantities having crossed international boundaries.

Improved cookstoves (also called clean/efficient cookstoves): is a device that is designed to consume less fuel and save cooking time, convenient in cooking process and creates smokeless environment in the kitchen or reduction in the volume of smoke produced during cooking against the traditional stove; and thus addressing the health and environmental impacts associated with traditional cookstoves. Traditional cookstoves (open fires and rudimentary cookstoves using solid fuels like wood, coal, crop residues and animal dung) are inefficient, unhealthy, and unsafe, and inhaling the acrid smoke and fine particles they emit leads to severe health problems and death. Traditional cookstoves also place pressure on ecosystems and forests and contribute to climate change through emissions of greenhouse gases and black carbon. Within the EREP targets are set for improved cookstoves, as the pressure on the ECOWAS woodland will grow exponentially. Thus the policy includes the banning of inefficient stoves after 2020, enabling 100% of the population of the urban areas to use high efficient wood and charcoal stoves (with efficiencies higher than 35%) from 2020 onwards and 100% of the rural population to use high efficient charcoal stoves from the same date on. In this template the MS is asked to set a target for improved cookstoves measured in terms of the % of the population that uses efficient cookstoves. This is estimated by dividing the number of inhabitants that use improved cookstoves by the total number of inhabitants of the country.

Informal building: Traditional buildings or buildings built without legal authorisation;

Kilowatt (kW): 1,000 watts

Kilowatt-hour (kWh): 1,000 watt-hours.

ktoe: thousand tonnes of oil equivalent

LED: Light Emitting Diodes

LPG: Liquefied petroleum gas

Major renovation: Renovation affecting the walls, roof and the bottom floor (for example wall insulation), the system (for instance a change of the air conditioning system) but also the addition of a new room with a useful area of more than 12 m².

Megawatt (MW): 1,000,000 watts

Megawatt-hour (MWh): 1,000,000 watt-hours

Modern fuel alternatives (for cooking): known as non-conventional or advanced fuels, these are any materials or substances that can be used as fuels for cooking, other than conventional solid fuels such as coal, fuelwood and charcoal. These alternatives cover Liquefied petroleum gas (LPG), biogas, ethanol, solar power (e.g. solar cookers) and kerosene. In this template improved cookstoves are not considered within the modern fuel alternatives, as they are object of a separate analysis in this template.

MS: (ECOWAS) Member States

Non-technical electrical losses: in electricity distribution consist of theft and non-payment for electricity (including unpaid bills, absence of billing, billing calculation errors and accounting mistakes). Non-Technical losses are caused by actions external to the physical power system.

Purchasing power parities (PPPs): are the rates of currency conversion that equalise the purchasing power of different currencies by eliminating the differences in price levels between countries

REDD+: Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. "REDD+" goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

Solar cookers: or solar oven is a device which uses the energy of direct sun rays (which is the heat from the sun) to heat, cook or pasteurize food or drink.

Solar thermal: use of solar thermal energy to produce heat, for instance for produce hot water, or to provide cooling services;

Technical losses in power system are caused by the physical properties of the components of the power system. The most obvious example is the power dissipated in transmission lines and transformers due to internal electrical resistance. Technical losses can be divided into transmission losses, occurring in the high voltage part of electricity grids, and distribution losses, occurring between the last power sub-station and the user's meter.

toe: tonnes of oil equivalent

Total Primary Energy Supply (TPES) is made up of: Indigenous production + imports - exports - international marine bunkers - international aviation bunkers +/- stock changes.

UNEP-GEF en.lighten initiative: The United Nations Environment Programme (UNEP)-Global Environment Facility (GEF) en.lighten initiative was established in 2009 to accelerate a global market transformation to environmentally sustainable, energy efficient lighting technologies, as well as to develop strategies to phase-out inefficient incandescent lamps to reduce CO₂ emissions and the release of mercury from fossil fuel combustion. The en.lighten initiative serves as a platform to build synergies among international stakeholders; identify global best practices and share this knowledge and information; create policy and regulatory frameworks; address technical and quality issues; and encourage countries to develop National and/or Regional Efficient Lighting Strategies.

USD: US Dollars

Useful floor area: floor area of dwellings measured inside the outer walls, excluding cellars, non-habitable attics and, in multi-dwelling houses, common areas

VAC system: the equipment, distribution systems and terminals that provide, either collectively or individually the processes of ventilating or air conditioned to a building or a portion of a building

VAT: Value Added Tax

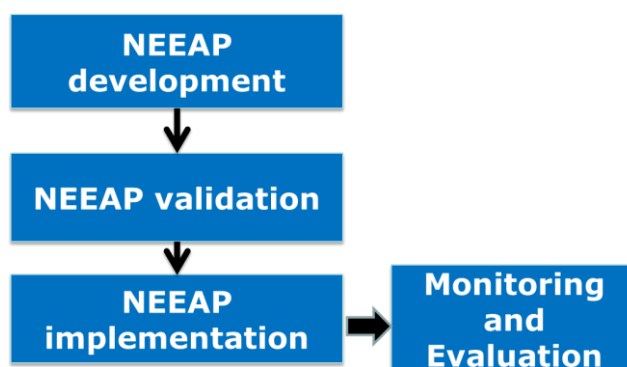
WACCA: West African Clean Cooking Alliance

Watt-hour (Wh): a measure of electric energy equal to the electrical power multiplied by the length of time (hours) the power is applied

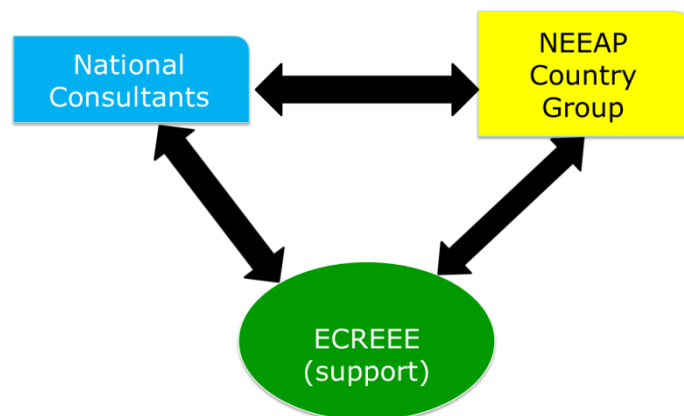
The purpose of the template is to aid ECOWAS countries in developing NEEAPs that are complete and cover all the recommendations defined in the EEEP. Use of this template will aid ECOWAS countries in developing plans that are comparable with each other. This will aid in monitoring the progress towards achievement of the EEEP targets, which ECOWAS countries will report in the future, through reports on implementation.

Additional information can be provided either in the prescribed structure of the Action Plan or by including annexes.

The main steps in the NEEAP process are outlined in the figure below. As part of the monitoring and verification.



The NEEAP will be developed as a collaborative and mutually supportive effort between the national consultants, the NEEAP Country Group (NCG) and ECREEE.



The NEEAP template considers national actions both at the level of the ECOWAS energy efficiency initiatives as well as at the level of energy consumption sectors. As guidance, the following matrix presents in an indicative manner the relationships between the EE initiatives and the different sectors considered here. Measures within a given initiative can encompass several sectors (e.g. EE Lighting or EE buildings cutting across residential, commercial/services and public sector). In their turn, measures in a given sector (e.g. residential) could encompass several initiatives.

	EE Lighting Initiative	EE Standards and Labeling Initiative	EE Buildings Initiative	High performance electricity distribution initiative	Safe, affordable, clean and sustainable cooking initiative
Residential sector	X	X	X	X	X

	EE Lighting Initiative	EE Standards and Labeling Initiative	EE Buildings Initiative	High performance electricity distribution initiative	Safe, affordable, clean and sustainable cooking initiative
Tertiary sector (commercial and services)	X	X	X	X	X
Industrial sector	X	X	X	X	
Transport sector					
Public sector	X	X	X	X	
Energy supply					
Other sectors					

ANNEX II - REGIONAL INITIATIVES AND ACTIONS IN ENERGY EFFICIENCY

1 ECOWAS ENERGY EFFICIENCY PROGRAMME

The ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) initiated the ECOWAS energy efficiency programme by soliciting financial support from the European Union (EU). The EU sponsored programme is dubbed Supporting Energy Efficiency for Access in West Africa (SEEA-WA). The SEEA-WA project was contributing to access to energy services in West Africa, through a regional programme to improve energy efficiency. The project aimed to overcome the technical, financial, legal, institutional, social, gender and capacity related barriers that hinder the implementation of cost effective energy efficiency (EE) measures and systems.

SEEA-WA focused on the special interests and realities of poor women and men in urban and rural areas. Based within the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE), SEEA-WA sought to combine improved energy efficiency with ongoing work on renewable energy sources, in order to broaden energy access.

SEEA-WA OBJECTIVES

The overall objective of SEEA-WA was to improve framework conditions for access to energy services, by supporting the creation of a regional programme on governance, related to energy efficiency and access.

The specific objectives were to:

- Aid the Development of policies and regulatory frameworks necessary for the adoption of energy efficiency measures;
- Raise the awareness of policy makers, regarding the commercial actors in the key energy value chains.
- Build capacity at the regional and national level to facilitate implementation of the key energy efficient technologies.

2 SEEA-WA DESCRIPTION

2.1 Framework conditions:

SEEA-WA aimed to support ECOWAS national authorities in creating a conducive regulatory and business environment to encourage women and men to adopt energy savings. Project team members aided in choosing among the wide variety of possible policy tools (standards and labelling, regulations, educational tools, fiscal and tariff tools, special purpose EE financial tools, etc.) those that would be applicable and effective in the West African context.

Raising Awareness:

Many energy efficiency measures pay for themselves, through savings on energy bills. Capturing this potential for savings requires decisions by a myriad of individuals, organizations and businesses. The awareness raising aspect of SEEA-WA reached out, on the one hand, to the commercial actors of the key energy value chains – the stove builders and charcoal producers, the electric appliance importers and sellers, the power utilities, the home builders – and on the other hand, to the women and men who use energy and make the decisions on purchasing (or producing themselves) the major energy using devices.

- SEEA-WA Project Technical Implementation Strategy: Work with competence Centres in West Africa to build capacity at the regional and national level in the implementation of the key energy efficient technologies.
- Encourage exchange of experience and the flow of information among energy practitioners in West Africa.
- Organize focused training on the areas designated by national authorities, bringing in high level regional and international expertise.

Regional action on energy efficiency will benefit both the minority in West Africa who currently have access to modern energy but are faced with high prices and unreliable services, as well as the majority, for whom gaining access to affordable modern energy depends on reducing costs so as to make access programmes economically viable.

2.2 Main Activities:

- Energy Efficiency stock taking, diagnosis in ECOWAS countries.
- Regional level institutional capacity building, knowledge sharing.
- National level institutional capacity building, knowledge sharing, institutional change.
- Development of ECOWAS EE White Paper.
- Formulating gender-sensitive energy efficiency policies and programmes.

2.3 Content and visual identity:

- Carry out national campaigns focused on key intermediaries.
- Carry out regional and national media campaign focused on general public.
- Regional and national capacity building on technical issues.
- Regional and national financial tools.

2.4 SEEA-WA Actions

2.4.1 Actions at the National Level

- Identification of a national Competence Centre for Energy Efficiency
- Stock taking of the current EE situation in the countries
- Supporting the identification and development of concrete EE actions
- Targeted Capacity Building

2.4.2 Actions at the Regional Level

- Energy Efficiency White Paper
- Development of policy tools (e.g. labels and standards)
- Establishment of a network (Exchange of information, best practice and lessons learned)
- Regional trainings on specific issues

3 THE EE POLICY (EEEP) AND TARGETS

The ECOWAS Center for Renewable Energy and Energy Efficiency (ECREEE), under the SEEA-WA project elaborated the ECOWAS Energy Efficiency Policy and set regional targets for energy efficiency measures in ECOWAS Member States. This policy has been adopted by the Heads of Government and authority of the ECOWAS Member States.

The ECOWAS Energy Efficiency Policy seeks to contribute to creating a favourable environment for private investments in energy efficiency, and spurring industrial development and employment through reduction of energy bills. Energy efficiency is considered as an integral part of the modernisation and greening of West African economies. The policy aims to implement measures that free 2000 MW of power generation capacity and in the long term, more than double the annual improvement in energy efficiency, so as to attain levels comparable to those of world leaders. In effect, the amount of energy needed to produce a certain amount of goods and services would decrease by about 4% annually.

The specific targets of the regional energy efficiency policy are:

1. Phase out inefficient incandescent lamps by 2020;

2. Reduce average losses in electricity distribution from the current levels of 15 - 40% to the world standard levels of below 10%, by 2020;
3. Achieve universal access to safe, clean, affordable, efficient and sustainable cooking for the entire population of ECOWAS, by 2030;
4. Adopt region-wide standards and labels for major energy equipment by end of 2014;
5. Develop and adopt region-wide efficiency standards for buildings (e.g. building codes);
6. Create instruments for financing sustainable energy, including carbon finance, by the end of 2013, and in the longer term, establish a regional fund for the development and implementation of sustainable energy projects.

3.1 The policy Answer

- Adoption of the White Paper on Access to Energy in 2006
- Creation of ECREEE in 2007: ECOWAS Centre for Renewable Energy and Energy Efficiency
- The SEEA-WA project - financed by the ACP-EU Energy Facility, UNDP, ADEME - supported the development of a regional Energy Efficiency Policy. Approved in 2012 by the region's Heads of State.

3.2 The Policy Targets

A process that was initiated at the first meeting of the Regional Multisector Group (Bamako, May 2005) led to the adoption by ECOWAS-UEMOA Heads of State (Niamey, January 2006) of a strategy for improved access to energy services: the "White Paper for a Regional Policy For Increasing Access to Energy Services For Populations in Rural and Peri-Urban Areas in Order to Achieve the Millennium Development Goals". The White Paper contains the following ambitious numerical targets for access to modern cooking fuel, to mechanical power for productive activities, and to electricity:

- 100% access to a modern cooking fuel;
- 60% access in rural areas to productive energy services in villages, in particular mechanical power to boost the productivity of economic activities;
- 66% access to an individual electricity supply;
- 60% of the rural population will live in localities with:
 - modernized basic social services - healthcare, drinking water, communications, lighting, etc;
 - access to lighting, audiovisual and telecommunications service, etc.;
 - The coverage of isolated populations with decentralized approaches.

4 The ECOWAS Programme on Gender Mainstreaming in Energy Access (ECOW-GEN)

In 2013, the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) launched a flagship programme entitled ECOWAS Programme on Gender Mainstreaming in Energy Access (ECOW-GEN). The programme was established against the background that women's potential, in the ECOWAS region, as producers and suppliers of energy services is under-utilized and that empowering women to make significant contributions in the implementation of the adopted regional renewable energy and energy efficiency policies is necessary for the achievement of the Sustainable Energy for All (SE4ALL) goals in West Africa. Moreover, the programme is founded upon the principles of the ECOWAS Gender Policy which emphasizes the "need to develop policies and programmes to provide alternative energy sources which would contribute to women's health and also alleviate their time burden".

To stimulate the development of women-led business initiatives in the energy sector, ECREEE, through the support of the Spanish Agency for International Cooperation and Development (AECID), established the ECOWAS Women's Business Fund. ECREEE will work with Member States to identify and support, through the fund, innovative energy projects implemented by women groups and associations. In addition to this, ECREEE will assist Member States to establish similar funds in their respective

5 The ECOWAS Solar Thermal Program

The overall goal of the Solar Thermal Program (SOLTRAIN) in West Africa is to contribute to the switch from a fossil fuel based energy supply to a sustainable energy supply system based on renewable energies in general but based on solar thermal in particular. The overall project will be coordinated by ECREEE and technically implemented by AEE INTEC in cooperation with 8 institutional project partners from 7 West African countries (Cape Verde, Nigeria, Burkina Faso, Ghana, Mali, Senegal, Niger and Sierra Leone).

The ECOWAS solar thermal capacity building and demonstration program therefore aims to remove existing awareness, political, technological, and capacity related barriers which restrict solar thermal energy deployment in ECOWAS countries. The program will also contribute to increase the grid stability and save national power reserves as solar thermal systems will significantly reduce the stress on electric grids due to the shift from electricity to solar energy. The program links precisely to the goals of the regional policies on Renewable energy and energy Efficiency adopted by the ECOWAS Authority of Heads of State and Government in 2013. The regional policies considered solar thermal as a least cost sustainable energy technology and set specific targets for its use to meet sanitary and industrial hot water needs in the region.

The goals of SOLtrain West Africa are:

- Capacity Building by theoretical and practical Train-the-trainer courses to selected universities and polytechnic schools in the area of solar water heating and solar thermal drying
- Identify, monitor, analyze and improve existing solar thermal systems together with the partner institutions (practical training).
- Technical support of local producers.
- Design and Install solar thermal systems on the partner institutions for teaching and demonstration purposes.
- The partner institutions will offer trainings to national companies, installers, producers and further training institutions within their countries.
- Installation of 200 Demonstration systems at social institutions as schools and hospitals engineered by the partner institutions and installed by national practitioners
- Trainings to administrative, political and financial stakeholders in each country
- Solar thermal testing facility in one of the countries

The programme will run from 2015 until 2018 and will strengthen the capacity of national actors and of existing partner institutions dealing with solar thermal energy such as polytechnic schools and universities in all 15 ECOWAS Member States.

6 PROSPECTS FOR THE FUTURE

To be able to achieve these policy targets, specific initiatives have been put in place in order to define the future prospects and the way forward for EE in the region. The step-by-step implementation of these initiatives is described below.

6.1 Specific EE initiatives

The policy elaborates specific programmes that have been earmarked to achieve the ECOWAS EE. These programmes are classed into (6) priority initiatives namely:

- Standards and labelling
- Efficient Lighting,
- High performance of Distribution of Electricity,
- Energy Efficiency in Buildings,
- Safe, Sustainable and Clean Cooking,
- Financing Sustainable Energy.

7 STANDARDS AND LABELLING

The main components of the ECOWAS energy efficiency Standards and Labelling initiative are as follows:

- Regional cooperation on the development and implementation of ECOWAS regional standards and labels for energy using equipment (lighting, refrigerators, air conditioners, motors, cooking etc.) and coordination with international standards development, for example with clean cookstoves;
- Regional cooperation on the development and implementation of legislative, regulatory and other energy efficiency policies and tools such as product efficiency rating systems, the definition of multiple tiers of product performance and standardized testing and certification of equipment to verify performance and accuracy of labelling;
- Awareness raising for national authorities, manufacturers and the general public
- Capacity building of main stakeholders and training and qualification of staff
- Development and implementation of financial instruments to support the implementation of ECOWAS standards and labels. This refers both to securing funding for development and implementation of the S&L initiative and to the introduction of financial incentives to promote the adoption of efficient energy using equipment by end-users.

7.1 Key Actions on standards and labeling at regional and national levels

The main activities to be conducted in the framework of the ECOWAS energy efficiency standards and labelling initiative are listed as preparatory phase, design and development phase and implementation phase. This document will detail the implementation phase actions to enhance development of the various National Energy Efficiency Action Plans.

(See Sub-Annex 1a for standards and labeling implementation phase actions **)**

8 EFFICIENT LIGHTING

To ensure effective and self-sustaining transition to efficient lighting in all ECOWAS countries, a cohesive set of national and regional actions regarding on-grid and off-grid lighting have been designed for implementation in these countries. These actions cover the four parts of the integrated policy approach:

- Minimum Energy Performance Standards (MEPS);
- Supporting Policies and Mechanisms (SPM);
- Monitoring, Verification and Enforcement (MVE); and
- Environmentally Sound Management (ESM).

The scope and depth of these actions will vary from country to country depending on whether the country has: i) many or intensive MEPS/SPM/MVE/ESM activities underway or planned; or ii) some MEPS/SPM/MVE/ESM activities underway or planned; or iii) no MEPS/SPM/MVE/ESM activities.

In order to meet the objectives of this Strategy, it is intended that energy efficiency interventions will be implemented through a phased approach. The timing of the three Phases is as follows:

- Phase 1: July 2014 to December 2015;
- Phase 2: January 2016 to December 2016;
- Phase 3: January 2017 to December 2020

The key activities under the four thematic areas of the Strategy are summarized as follows:

8.1 Minimum Energy Performance Standards – Key Activities

- Conduct national consultations with policy makers and other stakeholders on the Harmonised MEPS of on-grid and off-grid efficient lamps

- Pursue the process of the ECOWAS Standards Harmonisation Model (ECOSHAM) to adopt and publish ECOWAS Harmonised MEPS of on-grid and off-grid efficient lamps
- Adopt ECOWAS Harmonised MEPS of on-grid and off-grid efficient lamps (by each ECOWAS Member Country) and publish in national official journal.

Through stakeholder consultations, the Thematic Working Group on Minimum Energy Performance Standards developed Minimum Energy Performance Standards for Mains-Voltage General Lighting Service Lamps and Minimum Energy Performance Standard for Off-Grid Lighting Products. The key requirements under the Minimum Energy Performance Standards for Mains-Voltage General Lighting Service Lamps include:

Lamp Efficacy – lamps must have a minimal efficacy, measured in lumens per watt (lm/W) of the following:

Rated Lamp Wattage LP (W)	Minimum Efficacy (lm/W)
LP<5	40
5 ≤ LP < 9	45
9 ≤ LP < 15	50
15 ≤ LP < 25	55
LP ≥ 25	60

- Lamp Lifetime – lamps shall have a rated lamp lifetime of 6000 hours or more, as measured according to the appropriate IEC test standard.
- Power Fluctuation Tolerance – lamps shall be able to operate within a voltage range of 160-260V.
- Power Factor – lamps shall have a power factor that is no less than the values shown

Rated Lamp Wattage	Minimum Power Factor
<25W	≥ 0,50
≥25W	≥ 0,90

- Light Quality – lamps shall achieve a colour rendering index (Ra) of 0.80 or higher.
- Lamp Mercury Content – lamps shall contain no more than 2.5 mg of mercury.

The key requirements under the Minimum Energy Performance Standard for Off-Grid Lighting Products include:

- **Lumen Maintenance** –the light output of the product shall be ≥ 85% of specified light output at 2,000 hours AND ≥ 95% of specified light output at 1,000 hours(depreciated at highest setting) (draft)
- **Durability and Quality** – the off-grid lighting product must comply with the following quality standards:
- **Charger** – any included AC-DC charger must carry approval from an accredited consumer electronics safety regulator.
- **Battery** – must be protected by an appropriate charge controller that prolongs battery life and protects the safety of the user. No battery may contain cadmium or mercury at levels greater than trace amounts.
- **Water Protection**
- **Portable Separate Systems: IP x1**
- **Portable Integrated System: IP x3**
- **Fixed (outdoors) Integrated System** – permanent outdoor exposure: IP x3
- **All PV Modules** - permanent outdoor exposure: IP x3 AND circuit protection
- **Brightness** – At least one lighting level, which defines the “specified light output” in subsequent testing, must meet one of the following criteria:
- **Light Output** must be greater than 25 lumens or greater than 50 lux over an area of 0.1 m² under test conditions described in IEC TS 62257-9-5.

8.2 Supporting Policies and Measures – Key Activities

- Inform consumers, policy makers and other stakeholders of the advantages of efficient lighting products over the traditional lighting products – on radio, television, at public fora organized in various public places such as lorry stations, sponsored events at community centres, under the sponsorship of the traditional leaders (chiefs, elders and opinion leaders)
- Distribute free on-grid and off-grid efficient lighting products or at subsidised cost to carefully selected communities (with retrieval and destruction of replaced incandescent lamps)
- Implement of social housing projects fully equipped with efficient lighting
- Implement financing schemes to cover the upfront cost of efficient lighting products (e.g., on-bill financing)
- Implement harmonised mandatory labelling and certification for on-grid and off-grid efficient lamps in all ECOWAS countries

8.3 Monitoring, Verification and Enforcement – Key Activities

- Establish National Registries for on-grid and off-grid lighting products
- Monitor efficient on-grid and off-grid lighting products at ports and markets of ECOWAS countries
- Establish a Regional Test Laboratory for on-grid and off-grid efficient lighting; ensure this laboratory has international accreditation
- Establish National Test Laboratories for on-grid and off-grid efficient lighting or strengthen selected existing national laboratories; ensure this laboratory has international accreditation
- Make importers, wholesalers and distributors of efficient lamps and their customers aware of penalties for non-compliance of standards and labelling requirements

8.4 Environmentally Sound Management – Key Activities

- Create public awareness of the environmentally sound disposal of on-grid and off-grid efficient lamps and batteries
- Develop and adopt national regulation for environmentally sound disposal of spent on-grid and off-grid efficient lamps and batteries
- Develop and implement national collection systems established for spent on-grid and off-grid efficient lamps and batteries
- Develop and establish commercially viable recycling and disposal facility for spent on-grid and off-grid efficient lamps and batteries

9 ENERGY EFFICIENCY IN BUILDINGS

The Energy Efficiency in buildings has a policy and regulation prepared on the ECOWAS Directive on Energy Efficiency in buildings and submitted at the ECOWAS Energy Ministers meeting for approval.

9.1 General Activities of national interest

Other activities that could be incorporated into different national actions include:

- Identifying and analysing the real energy data consumption of buildings in ECOWAS countries in order to propose reference values on energy consumption, and also prepare regional standards and labelling for energy performance of buildings;
- Specifying the contents of existing building codes and legislations on energy efficiency in buildings in the 15 ECOWAS;
- Individual countries to revise or develop building codes and legislations on energy efficiency in buildings in order to transpose the regional directive into National building codes;
- Carrying out pilot projects of energy performance construction in countries (for example construction of bioclimatic schools showing experiences and local materials)

9.2 National training programmes on EE in Buildings

- Train the trainer on thermal calculations tools and energy performance of buildings.
- Train the trainer for best building /construction practice and for energy audits in buildings

10 HIGH PERFORMANCE OF DISTRIBUTION OF ELECTRICITY

Electricity distribution systems are by nature local. It is however worth noting that, in some countries, cross border distribution can be advantageous. This means that the solutions adopted must be implemented by a local distribution company with the aid and cooperation of national authorities and international partners. While the actions to be carried out are local, WAPP and ECREEE can provide regional support to facilitate national action. The "Alliance for High Performance Distribution of Electricity" which brings together the activities of ECREEE and WAPP aims to provide this support through the following actions:

- Facilitating sharing of experience and best practices among West African distribution companies.
- Carrying out regional capacity building programmes.
- Facilitating the sharing of human and technical resources among West African distribution companies.
- Creating a data base, through cooperation between WAPP and the ECREEE Energy Observatory, on the state of the electricity sector in the ECOWAS countries, including production, losses, tariffs, etc.
- Creating awareness among national political leaders on the issues, opportunities and obstacles to improving power distribution, through high level political events at the regional level.
- Creating a large West African market in high performance distribution equipment, so as to lower costs, through regional standards for equipment.
- Fostering regional production of high performance distribution equipment, to feed a regional market.
- Supporting the creation of a West African research network for power distribution, adapted to West African conditions.
- Facilitating financing of national upgrading programmes, through regional meetings with development and finance partners.

11 SAFE, SUSTAINABLE AND CLEAN COOKING

11.1 Policy and regulatory framework

The policy and regulatory framework on clean cooking calls for the development and adoption of national cooking policies, strategies and targets, including legal and regulatory mechanisms in line with the existing ECOWAS regional policies and the SE4ALL initiative. It aims to reach market transformation towards modern and alternative fuels and efficient devices to reduce health and environmental impacts of traditional fuel use on the people.

11.2 Regional initiatives to support national actions

The regional initiatives target the development of a national action plans for clean, safe, efficient and affordable cooking energy solutions including an assessment of the current situation (framework conditions/barriers, cooking habits, market for clean cook stoves, producers etc.), as well as targets and strategies to reach these targets.

A national action plan could be developed around the following intervention logic:

- Enhancing demand
- Strengthening supply
- Fostering an enabling environment
- Support the promotion of market-based solutions (including the private sector, NGOs, community-based organisations and microfinance organizations) and the enhancement of market mechanisms.
- Support the build-up of participatory, integrated institutional approaches, where communities play a key role. Community-based strategies can be helpful along the whole value chain from community-managed forests through modern supply channels and more efficient end-user equipment

11.3 Possible measures to develop LPG programmes include, among others:

- Modernizing regulatory frameworks
- Formally adopting of international quality and safety standards

- Improving roads and port infrastructure and reducing port congestion
- Communicating information widely to the public in nontechnical language, specifically, address perception of high risk of LPG use for cooking in households
- Facilitating operator training
- Monitoring to discourage commercial malpractice as well as raise public awareness
- Offer incentives to encourage private LPG retail/service companies to build up distribution network and retail outlets
- Developing financial schemes such that LPG marketers can offer micro-finance schemes, and can lower barriers to LPG selection by making it easier to finance cylinder deposit fees and stove purchases

The specific objectives of the safe and sustainable cooking initiatives include:

a) Creating a self-sustaining entrepreneurial network of rural micro-enterprises for delivery of improved biomass fuels. Measures to achieve this objective could be, among others:

- Conducting training courses for new entrepreneurs wherever required
- Conducting refresher courses for successful entrepreneurs

b) Promotion and marketing activities, e.g. village level awareness camps and programmes organised to create marketing opportunities for the new enterprises

- Ensuring quality of the products through continuous monitoring and evaluation
- Encouraging local banks and financing institutes to support the new businesses

c) Establishing the use of improved biomass fuels as a common practice for rural households by:

- Strengthening and expanding PSFM in production forest areas: support the development of strategic partnerships and collaborative arrangements with national institutions and Non-Profit Associations, regional and international agencies.
- Ensuring community engagement in PSFM and village livelihood development
- Pilot forest landscape management: develop methodologies and frameworks for forest landscape management
- Enabling a legal and regulatory environment (especially forest law) For example:
- Assessment of national REDD+ potential
- Development of a REDD+ Strategy, including assessments such as: forest conservation and use, agriculture, energy, livelihoods, rural economy, biodiversity & ecosystem services, development issues etc.
- Development of criteria & guidelines for the development of REDD+ pilot projects
- Undertake assessment of environmental and social issues and risks: identify major potential synergies or inconsistencies of country sector strategies in the forest, agriculture, transport, or other sectors with the envisioned REDD+ strategy

d) Establish a monitoring system for the fuel wood value chain in order to prevent uncontrolled deforestation and guarantee sustainable forest management.

Examples:

- Involve women in the conceptualization, development and implementation of energy policies, projects and programmes as much as possible
- Produce promotional messages to address the gender issue and attempt to form partnerships with women's groups (or NGOs in the area)
- Develop programmes to train young women to produce, operate and maintain equipment on their own
- Develop and implement gender-responsive national policies and programmes on clean and efficient cooking
- Economic empowerment of women through their increased involvement in the cooking energy value chains
- Capacity building of policy makers and practitioners to integrate gender in their cooking energy policies and programmes
- Integration of gender indicators in all baseline studies

- Conduct gender analysis of business models to evaluate economic implications for women in the value chain as well as social benefits and barriers for women related to different production modes
- Development of practical guidelines for mapping gender in the cooking energy value chains
- Gender integration in marketing and awareness raising messages at regional level to ensure that women and men are targeted and to ensure the content is gender sensitive

12 THE WEST AFRICAN CLEAN COOKING ALLIANCE-WACCA

The ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) initiated a regional Cooking Energy initiative called West African Clean Cooking Alliance (WACCA). It was officially launched during the ECOWAS High Level Energy Meeting in Accra, Ghana, on 30 October 2012. The overall objective of the initiative is to provide access to clean, safe, efficient and affordable cooking energy in the entire ECOWAS region. The principal goal of the initiative is to improve living conditions (economic, social and health) of the population of ECOWAS countries through an increased access to cleaner and more efficient cooking fuels and devices, sustainable biomass and modern fuels, while reducing local (deforestation) and global (greenhouse gases emissions) environmental impacts. The WACCA objectives are in line with the overall objective of ECREEE to promote energy access, renewable energy and energy efficiency within the ECOWAS region and thus by 2020, 60% of the population and by 2030, the entire ECOWAS population shall have access to clean, safe, efficient and affordable cooking energy.

At regional level, WACCA is set to build upon existing interventions on the various fuels and technologies, accumulate and share knowledge on the available existing technologies and technical approaches. WACCA will facilitate the adoption of standards for cooking technologies in accordance with international agreements as developed under the Global Alliance for Clean Cookstoves (GACC) and through that, enhance and complement activities implemented in the framework of the ECOWAS Regional Programme on Sustainable Energy for All (SE4ALL) through the use of Renewable Energy (promotion of alternatives of Fuelwood) and Energy Efficiency (ECOWAS Initiative on Standards and Labeling). The capacities for research and policy development on guidelines for the value chain of cooking fuels (wood, charcoal, LPG, bio-ethanol, etc.) will be strengthened and a consistent system for monitoring and evaluation in accordance with other monitoring and evaluation systems will be developed at regional level.

At national level, WACCA will assist in mapping the existing initiatives on fuel and cooking equipment and updating national strategies for cooking energy. Through the evaluation of solutions and bottlenecks, the initiative will enable the development of approaches for the local production of equipment and fuels and market development for technologies and fuels. Key elements of the initiative will be development of clean cooking strategies, capacity development, and implementation of awareness campaigns and establishment of financing mechanisms.

Agencies and organisations working together with ECREEE include:

- ETC-Energia,
- Global Alliance for Clean Cookstoves (GACC)
- Austrian Energy Agency (AEA)
- GERES,
- GIZ and
- ICEED

Sub-Annex 1a: Standards and labelling Implementation phase actions

Step	Description	Priority	Resource Needs
1	Implementation of core activities		
	Conduct training and informational workshops to educate and build capacity among stakeholders. For instance:		

1.1	<ul style="list-style-type: none"> - Training workshops to build capacity on standards and labelling in the national standards bodies and energy authorities - Training workshops in certification procedures, compliance monitoring, and enforcement programs. - Training of importers, retailers and other relevant stakeholders such that they actively support the initiative. 	H	H
1.2	Initiate the Institutional Development Plan.	H	H
1.3	Initiate the Monitoring, Verification, and Enforcement Plan.	H	M
1.4	Initiate the Monitoring & Evaluation Plan	H	M
1.5	Initiate the Communications Plan and launch awareness campaigns	H	H
2.0	Product Policy Implementation		
2.1	Assess international product definitions, test protocols, rating schemes, performance level definitions, certification procedures, technical analyses, and data sources for use as a baseline in development of S&L policy for the selected product category	H	L
2.2	Collect additional market data and baseline usage and performance data for the selected product category, as necessary to inform a decision on efficiency performance levels, for instance through field surveys (e.g. end-use metering studies) and laboratory testing	H	H
2.3	Development of minimum energy performance standards (MEPS) for selected products on the basis of market analysis and international benchmarking	H	M
2.4	Organize a series of in-person stakeholder meetings for the selected product category to discuss proposed efficiency requirements, collect feedback, and encourage institutional buy-in.	H	L
2.5	Adopt or develop a test method for evaluating energy performance of the selected product. Take steps to harmonize with international test methods, to the extent that such standards are available, applicable for use in the region, and can help to expedite the policy development process	H	L
2.6	Finalize requirements for certification and regional recognition of qualified products	H	L
3.0	Implementation of complementary activities		
3.1	Development of supporting government activities to increase the effectiveness of energy efficiency standards and labels, such as government promotion of the programme, inclusion into government procurement policy and publication of lists of current models on the market	M	L
4.0	Financing of implementation of the S&L initiative		
4.1	Explore options for technical assistance and develop proposals for potential donors in order to secure funding for implementation of the S&L	H	L

Notes: H=High, M=Medium, L=Low