ENERGY INVESTMENT AND BUSINESS CLIMATE REPORT FOR OBSERVER COUNTRIES

THE ISLAMIC REPUBLIC OF MAURITANIA

Co-authors:

Mr Lehbib KHROUMBALY

Mr Can ÖĞÜTÇÜ

Mr Mohamed LEMINE CHEIKHNA

Mr Matteo BARRA

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"USD400 billion in energy investment needed for Africa until 2040"

IEA Africa Energy Outlook 2015

In G20 framework, 2015 was a period particularly dedicated to the promotion of energy access in Sub – Saharan Africa. On this occasion, the Energy Charter participated to the various G20 working groups on "Energy Sustainability" to contribute to the efforts on improving access to energy in African continent.

The Energy Charter Treaty allows countries to increase their investment attractiveness and provide a reliable legal framework for foreign direct investment. Several African countries began their accession process to the Energy Charter Treaty in 2015 including Mauritania.

Access to energy is a key factor to improve living conditions, overcome poverty and enhance sustainable economic growth. Insufficient access to energy acts as a significant barrier to economic and social development in many countries. The G20 agenda in 2016 embraces critical goals and challenges among which energy access still poses the biggest concern worldwide. Policy incentives and recommendations are required to remove existing barriers and to reduce number of population, which does not have an access to electricity.

FOREWORD

The essence of the Energy Charter process and its landmark impact on the decade of the 1990s have shown a path to foster international cooperation in the energy sector. Under the cornerstone concept of national sovereignty, different governments across the world with diverse perspectives and ideas on how to develop their energy sectors have been able to implement international cooperation within the framework of their own energy policies, promoting their integration into the global energy markets. The recent climate agreement reached in Paris (COP21) only confirms that energy transition is at heart of international relations for decades to come.

This report aims to provide useful insights and a basis of common understanding in the path of Mauritania to become a Contracting Party to the Energy Charter Treaty. It is also my pleasure to point out that this report served as basis for the accession reports prepared by the Republic of Mauritania to accede to the Energy Charter Treaty. It is therefore my great pleasure to present to you this useful report. I am confident that it will contribute to deeper involvement of many other African countries within the Energy Charter Process.

Dr Urban Rusnák

Secretary General

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The information contained in this report served as basis for the accession reports prepared by Mauritania to accede and become a Contracting Party to the Energy Charter Treaty. The report was prepared by **Mr Lehbib Khroumbaly**, from the National oil Company of Mauritania, **Mr Mohamed Lemine Cheikhna** from the Ministry of Energy and Mines, **Mr Can Ogutcu** and **Dr Matteo Barra** from the International Energy Charter Secretariat, during the year 2015.

The International Energy Charter Secretariat, in collaboration with the **European Commission, DG Development and Cooperation**, has developed a capacity building programme with African countries to introduce them to the universal market-based principles enshrined in the Energy Charter Treaty, and to assess their energy sectors against these universal principles. The objective is to promote an investment friendly regulatory environment that is necessary to address the energy challenges facing the African continent.

The report "Energy Investment and Business Climate Report for Mauritania" has been funded under the EU Technical Assistance Facility for the Sustainable Energy for All Initiative – Western and Central Africa and is the result of the capacity building programme that for three months brings secondees from African governments to the Energy Charter Secretariat in Brussels. The secondment of a civil servant designated by the Ministry Energy of Mauritania and the elaboration of this report are part of a broader strategy aiming to engage the country in further energy policy reform in line with international standards.

The Energy Charter Treaty is a multilateral international treaty concluded in 1994 currently in force among 54 contracting parties from Europe, Central Asia, South Caucasus and East Asia. The Treaty offers a multilateral cooperation platform for the promotion and protection of energy investments. **The Energy Charter Secretariat** offers its technical assistance to contracting parties and observer countries by means of energy investment country reports, policy recommendations, model agreements, regional cooperation, seminars and training programs, private sector dialogue.

The authors:

Mr Lehbib Khroumbaly is a senior economic advisor to the National oil Company of Mauritania. He was seconded by the Ministry of Mines and Energy of Mauritania to the Energy Charter Secretariat in 2015. **Mr Mohamed Lemine Cheikhna** is an expert at the Electricity Department of the Ministry.

Mr Can Ogutcu is responsible for providing policy support and assistance to countries interested in acceding to the Energy Charter Treaty and in engaging with the Energy Charter process at the International Energy Charter Secretariat. His main tasks include technical assistance to governments in the accession stage to the Energy Charter Treaty.

Dr Matteo Barra is Senior Investment Expert at the Energy Charter Secretariat (Brussels, Belgium). Dr. Barra acts as expert on the promotion and dispute settlement of international energy investments under the Energy Charter Treaty. His main tasks include technical

assistance to governments (Mongolia, Morocco, Armenia, Latvia, Cyprus, Tajikistan), cooperating with international organizations (IEA, IRENA, UNCTAD, OECD, ICSID, SCC, PCA) and promoting dialogue with energy industry (Energy Charter Industry Advisory Panel). He provides policy analysis in relation to investment dispute settlement and to energy investment strategies. Dr. Barra holds a Ph.D. in International Economic Law (Bocconi) and an LL.M. in International Energy Law and Policy (CEPMLP).

ENERGY CHARTER SECRETARIAT

Executive Summary

The purpose of this study is to analyse the investment climate, market structure and the energy efficiency in Mauritania and its relation with the international standards that have been developed for the energy industry. A manifestation of those standards has been expressed by the *International Energy Charter*, signed on May of 2015. More than 80 countries have so far agreed on the importance of the development of sustainable energy markets, where there is an improvement of energy security and efficiency in all value chains of the sector in a mode that is economically, socially and environmentally viable.

Mauritania has decided to facilitate an access to its economy to foreign investors and international donors, welcome foreign capital, knowledge and technology to unlock its energy potential. Under a framework underpinned by constitutional, legal and institutional reform, the government of Mauritania has decided to accede to the Energy Charter Treaty.

This innovative perspective, to elaborate long-term policy planning and to improve the diversification of the energy mix, has opened the doors to this African country to other sources of sustainable energy. This aspect also provides the foundation for the development of a policy perspective that is more aligned with the objectives of sustainable development and low carbon economy, which are now the basis of the global energy transition as agreed in December 2015 in the COP21 in Paris.

The alignment of the principles and ideas that have driven Mauritania's energy reform and the benefits driven by the *Energy Charter Treaty* is the key focus of this report. It will allow the reader to have an understanding on how the universal concepts developed under the Energy Charter Process benefit from the particular national development and implementation in the modernisation and transformation of Mauritania's energy sector. The accession of Mauritania to the Energy Charter Treaty would certainly prove to the international community that Mauritania is committed to head towards modern energy market and would help the Mauritanian Government to create a level playing field and strengthen its position in the context of regional energy cooperation.

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Acronyms and Abbreviations

ADER	Rural Electrification Agency (Agence d'Electrification Rurale)
ADU	Urban Development Agency (Agence pour le Développement Urbain)
AEMP	Executive Agency for Microprojects (Agence d'Exécution des Microprojets)
AFESD	Arab Fund for Economic and Social Development
AGR	Income Generating Activity (Activité Génératrice de Revenu)
AIDS	Acquired Immune Deficiency Syndrome AIS Automatic Identification Syst
AMEXTIPE	Mauritanian Public Works and Employment Executive Agency (Agence Mauritanienne d'Exécution des Travaux d'Intérêt Public et pour l'Emploi)
ANADER	National Agency for the Development of Renewable Energies (Agence Nationale de Développement des Energies Renouvelables)
ANAIR	National Refugee Integration Support Agency (Agence Nationale d'Appui à l'Insertion des Réfugiés)
ANAPEJ	National Youth Employment Promotion Agency (Agence nationale de promotion de l'emploi des jeunes)
ANAT	National Land Use Management Agency (Agence Nationale d'Aménagement des Terrains)
ANRPTS	National Population and Secure Title Registration Agency (Agence Nationale des Registres des Populations et des Titres Sécurisés)
APAUS	Agency for the Promotion of Universal Access to Services (Agence de Promotion de l'Accès Universel aux Services) APC Competency-based Approach (Approche Par Compétence)
ARE	Regulatory Authority (Autorité de Régulation)
BCM	Central Bank of Mauritania (Banque Centrale de Mauritanie)
CAPEC	Caisse Populaire d'Epargne et de Crédit
CCIAM	Mauritania Chamber of Commerce, Industry, and Handicrafts (Chambre de Commerce, d'Industrie et d'Artisanat de Mauritanie)
CCLP	Consultative Committee on Poverty Reduction (Comité de Concertation sur la Lutte contre la Pauvreté)
CDHAHRSC	Commission on Human Rights, Humanitarian Action, and Civil Society Relations (Commissariat aux Droits de l'Homme, à l'Action

	Humanitaire et aux Relations avec la Société Civile)
CDHLCPI	Commission on Human Rights, Poverty Reduction, and Integration (Commissariat aux Droits de l'Homme, à la Lutte contre la Pauvreté et à l'Insertion)
CDLP	Government-Donor Consultative Committee on Poverty Reduction (Comité de Concertation Etat - Donateurs sur la Lutte contre la Pauvreté)
CENI	Independent National Elections Commission (Commission Electorale Nationale Indépendante)
CILP	Interministerial Poverty Reduction Committee (Comité Interministériel de Lutte contre la Pauvreté)
CNAM	National Health Insurance Fund (Caisse Nationale d'Assurance Maladie)
CNCCI	National Consultative Commission on International Trade (Commission Nationale de Concertation sur le Commerce International)
CNHY	National Hydrocarbons Commission (Commission Nationale des Hydrocarbures)
CNTIE	National Council on Extractive Industry Transparency (Conseil National de Transparence des Industries Extractives)
CPI	Investment Promotion Commission (Commissariat à la Promotion de l'Investissement) CPM : Monetary Policy Council (Conseil de Politique Monétaire)
CRDES	Regional Economic and Social Development Committees (Comités Régionaux de Développement Economique et Social)
CTLP	Technical Committee on Poverty Reduction (Comité Technique de Lutte contre la Pauvreté)
CTSPE	Technical Committee on Economic Program Monitoring (Comité Technique de Suivi du Programme Economique)
CTSPE	Economic Program Monitoring Technical Committee (Comité Technique de Suivi du Programme Economique)
DAPBI	Annual Initial Budget Programming Document (Document Annuel de Programmation Budgétaire Initiale)
DGB	Directorate General of the Budget
DHR	Refined Hydrocarbons Directorate (Direction des Hydrocarbures Raffinés)
EITI	Extractive Industries Transparency Initiative

FNRH	National Hydrocarbon Revenue Fund (Fonds National des Revenus des Hydrocarbures)
GIP.SA	Oil Infrastructure Management Company (Gestion des Infrastructures Pétrolières (Société Anonyme
HCPI	Harmonized Consumer Price Index
HDI	Human Development Index
HIPC	Heavily Indebted Poor Countries (Pays Pauvres Très Endettés)
HPI	Human Poverty Index (composite index)
IDB	Islamic Development Bank
ILO	International Labor Organization
IMF	International Monetary Fund
IMF	Minimum Flat Tax (Impôt Minimum Forfaitaire
IRM	Islamic Republic of Mauritania
MAED	Ministry of Economic Affairs and Development (Ministère des Affaires Economiques et du Développement)
MDPMEDD	Ministry for Environment and Sustainable Development (Chargé de l'Environnement et du Développement Durable)
MPEMi	Ministry of Petroleum Energy and Mines (Ministère du Petrole de l'Energie et des Mines)
MPEM	Ministry of Fisheries and Maritime Economy (Ministère des Pêches et de l'Economie Maritime)
OMRG	Mauritanian Office for Geological Inspection (Office Mauritanienne de Recherches Géologiques)
OMVS	Organisation pour la Mise en Valeur du Fleuve Sénégal (the Senegal River Basin Development Organization)
ONS	National Statistical Office (Office National de la Statistique)
RGPH	General Population and Housing Census (Recensement Général de la Population et de l'Habitat)
SIGP	Geographic Information System for the Oil Sector (Système d'Information Géographique Pétrolier)
SMH	Mauritanian Hydrocarbons Corporation (Société Mauritanienne des Hydrocarbures
SNDD	National Sustainable Development Strategy (Stratégie Nationale de Développement Durable)
SNIM	National Mining Industries Corporation (Société Nationale des

	Industries Minières)
SOMELEC	Mauritanian Electricity Company (Société Mauritanienne d'Elecctricité)
SOMIR	Mauritanian Refinery Industries Corporation (Société Mauritanienne des Industries de Raffinage)
WILAYA	An administrative region governed by a Wali

1. GENERAL INFORMATION AND POLICY ISSUES

1.1. Area, position, climate

Size of the Country, population, climate and an Overview of the Economy:

The Islamic Republic of Mauritania (RIM) is located between the 15th and 27th degrees north and 5th and 17th degrees west longitude and occupies in the West African territory around 1,030,700 km². It is limited by the Republic of Senegal to the south - west by Mali in the southeast and east by Algeria in the North-East and Western Sahara to the north - west. To the west, Mauritania is bounded by the Atlantic Ocean and a coastline of about 700 km.

Figure 1: Map of Mauritania

Source: 2015 – National Geographic Institute

Table 1: General description

Position	West Africa
Area	1,030,700 km²
Administrative capital / Historical capital	Nouakchott / Chinguitty
Population	3.461.041
Climate	Sahelian
Territorial division	13 regions(Wilayas)
Territorial division	54 Districts(Moughatas)
Political system	Presidential
Official language	Arab
Official currency	Ouguiyas(MRO) 1.00 EUR=325.986 MRO Exchange rate as of 25 June 2015

Source: Office of National de Statistics (ON S)[1]

Populated by almost 3,5 million people in 2000, Mauritania has a density of 2.43 inhabitants per km². Formerly nomadic, the population of Mauritania has experienced in recent years a double process of settlement and urbanisation underpinned by the combined effect of several factors.

The country is bordered west by the Atlantic Ocean and the Western Sahara; east by Mali; and southwest by Senegal. The countries' high desert dominance generates a dry continental climate with temperatures which may vary significantly between day and night. Temperatures are chiller at the coast due to sea winds and rather humid at the riverside. The country has three seasons: (i) from November to April with sandstorms and moderate temperatures during the day and cold at night; (ii) a season harmattan characterized by a north-east wind which carries the hot and dry air and elevates the temperature; and (iii) a rainy season from August to October with thunderstorms and intermittent rain, increasing humidity and temperatures around 45 degrees.

The country has large deposits (gold, copper and iron ore) and oil reserves were discoveries off the coast. These are added to the Chinguetti oil field, discovered in 2001. These various resources doped by a flexible and attractive legislation concede an upturn in the economy of Mauritania, which has promised a bright future in particular in the field of export of ores iron,

[1] Office National de Statistique. www.ons.mr

gold, copper and oil as well as significant potential for uranium, phosphates, gypsum and quartz.

Macroeconomic Development:

Macroeconomic objectives have been achieved with a steady growth at an average of 7% and control inflation at a maximum level of 5% on average in 2013-2015. The acceleration of growth and the Stabilisation Macroeconomic are based on:

i. the deepening of structural reforms through: private sector development, reform of incentive systems, put in place procedures to better financing of the economy, and improve the liberalization of trade activities and the introduction of conditions for healthy competition;

ii. development of supporting infrastructure growth by the promotion and diversification of energy supply and development of transport infrastructure and ICT development; and

iii. the optimal exploitation of sources of growth through sound management of Natural resources generated by the oil and mining, fisheries and the maritime economy, industrial development, tourism and crafts, agriculture and livestock.

In 2013, the priority of the Government was to establish a favourable economic environment for poverty reduction and improvement of living conditions of the population through the implementation of:

i. Growth levels sustained economic in a stable macroeconomic framework;

ii. strategies sectorial adapted to priority programs of the Government.

In this context, the authorities sought to pursue macroeconomic policies and structural reforms to achieve in 2013 a real growth rate GDP 6.2%. The current account deficit was projected at 28.1% of GDP in 2013 against 27.6% of GDP in 2012. Moreover, it was mentioned that the overall balance marks a surplus of USD 257 million and gross reserves reached accordingly the equivalent of 7.4 months of imports.

In 2013 it was set as a goal that budget resources (excluding grants and oil) reach 372 Billion UM and the volume of overall spending would be UM 463 billion[2].

The base deficit (excluding oil and grants) is approximately 1% of GDP. The achievement of this overall target set for 2013 the government worked on following:

- reduce transfers and subsidies to institutions public for only represent 4.8% of non-oil GDP against 9.1% in 2012;
- control the costs of goods and services to 4.7% of non-oil GDP, and (iii) reduce interest on the public debt at 2% of non-oil GDP for 2013.

2 Banque Centrale de Mauritanie Rapport 2013, P 15 ; www .bcm .mr

Table 2: Macroeconomic data

	2011	2012	2013	2014	2015(p)
GDP (million US S)	4,147	3,954	4,183	4.286	4.461
GDP per capita	1,170	1,090	1,126	1,126.70	1,145
Nominal GDP growth (in %)	4,4	3,9	-	6,4	5,6
Real GDP growth (in %)	4.0	*7.0*	*6.7*	*6.8*	*6.8*
Inflation (in %)	*5,7*	4,9	4.3	3,5	4,3
Current public revenue (% of GDP)	29.86	39.4	33.76	35.554	35.303
Public expenditure (% of GDP)	29.35	36.6	34.88	35.503	35.055
Gross investment (% of GDP)	29.1	44.7	38.0	37.017	35.055
Increase / decrease in deposits (% of GDP)	22.8	12.8	12.9	-	-
The level of public debt (% of GDP)	81.8	89.8	87.6	70,0	69,7

Source: BCM; as elaborated by IMF.ONS.CSLP[3]

1.2. Energy Policy

The long term energy strategy of Mauritania relies on the following themes[4]:

- Increase in production capacity from national resources: hydro and natural gas;
- Development of interconnection with interconnected networks; by the rationalization of production centres within the country, through consolidation and construction of transmission infrastructure (HV/MV);
- Large scale integration of renewable energy;
- Implementation of sustainable solutions adapted for isolated communities

The strategy paper estimates the cost of the investment over € 720 million to achieve the goal targeted for 2030.

The Ministry of Energy adopted in 2013 a Master Plan setting the objectives for the generation and transmission of electricity in 2030 (funded by the World Bank Group) targeting areas with more than 500 households. The country confirmed and studied the consequences of its policies on energy consumption in its "Master Plan for generation and

[3] Cadre Stratégique pour la Lutte Contre la Pauvreté
[4] CSLP 2011-2015

transmission of electric power in Mauritania between 2011 and 2030. The main themes of the Master Plan are: expansion of the distribution network, strengthening the transmission and diversification of sources of production.

An economic study to define the supply of electricity at lower economic costs assessed the following options:

- Isolated network powered by diesel generators;
- Isolated network powered by diesel generators and a photovoltaic system without batteries;
- Isolated network powered by diesel generators and a photovoltaic system with batteries;
- Connection to the interconnected network;
- Realization of a spider centre.

The Sectorial Notes of the Ministry of Energy set-out the short term priorities of CSLP (PRSP) described in table 3.

Renewable Energy Promotion Strategy is being developed with the support of IRENA and UNDP. The strategy's main objectives are to assess the technical and economic potential of the different sources, define basic criteria (technology, typology of towns, etc.) and off-grid and to propose an Action Plan to implement this strategy.

Table 3: Short Term Energy Policy by 2016

	Priority	**Meaning**
1	Adapting the legal and regulatory framework to new constraints of the sector	- Revision of the Electricity Code - Development of new specifications of delegates public– Service
2	Provide the department with a clear vision on the Renewable Energy development and Rural Electrification	-Development of a Renewable Energy Promotion Strategy -Development Of a multifunctional platform program -Development Of a sectorial policy letter
3	Fostering universal access to electricity	-Implementation of multifunctional platforms program -Construction of 4 wind / power plants -Construction of 6 PV / thermal hybrid plants (rural IPES) - Construction of Hybrid- PV / Thermal plants -Construction of 100 multifunctional platforms -Construction of a distribution network -Construction of Kiffa thermal hybrid plant / Photovoltaic and LV networks in areas of Kiffa and Guerou -Construction of two hybrid plants in Nema and Adel Bagrou and LV networks in this area
4	Develop a transportation system and develop interconnections with neighbouring countries	-Construction of a 225 kV line (21 km) between the dual station and the OMVS post with the extension of the latter -Construction of a 225 kV line between Mauritania (Nouakchott) and Senegal (Tobène) -Construction of a 225 kV line between Nouakchott and Nouadhibou and

	Priority	Meaning
		related posts -Interconnections ,From the OMVS[5] network, of Rosso-Boghé and villages on the route -Interconnections From the OMVS network: Boghé-Aleg; Sélibaby-Kiffa;Kiffa Tintane 90 KV and 33 KV in surrounding communities and associated items -Construction Line HT Nouakchott - Bamako
5	Increase production capacity from local resources	-Construction of a central dual HFO / Gas 180 MW in Nouakchott -Construction of a wind power plant of 30 MW -Construction of 30 MW PV plant of in Nouakchott -Construction of a wind power plant of 100 MW in Boulenouar -Construction of Gouina Dam (OMVS)
6	Improve client services	-Execution of an energy drain Priority Programme of the Nouakchott production facilities and distribution -extension of distribution networks in Nouakchott (PEREN V) -Implementation 4500 Public Solar lighting kits in Nouakchott ;Chami and PK 55 from Nouadhibou -Setting Up a National Driving Centre (CNC) in Nouakchott -Development Of distribution networks of the chief towns of Moughataa -Digitalisation of Centres and migration to a new integrated information system -Improved Anti-Fraud

Source: Master Plan

Table 4: Key strategic commitments of the Mauritanian Energy Master Plan by 2030

	Description of Strategic Commitment
1	-The development of production capacities primarily from national and regional resources (mainly hydro and gas) PPP for large capacity (greater than 100 MW);
2	– The deployment of the interconnected network to the interior and to the sub-regional areas (Maghreb and West Africa) and the production sites grouping in 4-5 centers from 5 to 6 MW with fuel (ideally hybridized with renewables) via interlinking MV 33kV of all centers of the perimeter SOMELEC[6] and semi-urban areas of large size (including today identified the Aleg-Boutilimit axes Aleg-Maghta Lahjar Maghta Lahjar-Kiffa-Kiffa Sélibaby, Kiffa- Guerrou, Aioun-Tintane Nema-Timbédra, etc.);
3	– For rural and semi-urban areas: (i) the completion of distribution networks and their delegation to private operators for all localities of over 2,500 inhabitants outside of the main towns of Moughataa (including promoting the interconnection of electricity networks where deposits of economies of scale are identified), (ii) decentralized electrification by mini-grids for all other locations between 1000 and 2500 inhabitants, (iii) priority Promotion of renewable energy and alternative appropriate technologies for communities with between 500 and 1000 inhabitants and in high-cost areas;
4	– The large-scale integration of renewable energies, especially connected to the network, to achieve a more balanced national energy mix and the implementation of a national energy efficiency program (energy efficiency and rational use energy)

Source: Master Plan

[5] Organisation pour la Mise en Valeur du Fleuve Sénégal (the Senegal River Basin Development Organization)
[6] Société Mauritanienne d'Electricité

1.3. Institutional structure and responsibilities for energy policy

The role of the Ministry of Energy is to define and implement: the *National Energy Policies* and the *Development of Sectorial Strategy* and follow the developments in the energy field..

The Government promotes: investments, competition based on transparency and non-discrimination, connect Mauritanian's energy system with systems of other countries (taking into account economic trends and energy needs) and the participation of the private sector in the energy sector. The key stakeholders in Mauritania's energy sector are:

Multisector Regulatory Authority (MRA)

The law on the Multisector Regulatory Authority (MRA) was adopted on 25 January 2001. The Regulatory Authority is supervised by a National Council for Control and operational directorates under the authority of the President of the Council.

The Council is composed of five (5) members appointed by decisions in accordance with the provisions of Article 28 of the Law 2001-18 of 25 January 2001:

- Three (3) members are appointed by decision of the President of the Republic
- One (1) member shall be appointed by the President of the Senate;
- One (1) member shall be appointed by the President of the National Assembly.

The powers of the Authority, previously limited to the telecommunications sector, the water sector and the electricity and created an independent regulatory body. At the same time, the Code of Electricity, adopted in 2001, liberalized production, transmission, distribution and sale of electricity under the control of the regulatory authority over all the Mauritanian territory[7].

Ministry of Petroleum Energy and Mines (Directorate of Electricity)

The directorate of electricity and energy management within the department develops implements and monitors the implementation of policies, strategies and state programs in the Electricity sector. It is responsible for the development of renewable energy. After the merger with the National Energy Management Unit (NEMU), founded in 2002, is now directly responsible for the development of a comprehensive energy efficiency policy for development, maintenance of energy accounting and energy balancing.

SOMELEC (Mauritanian Company for Electricity)

SOMELEC was created from the split of the former SONELEC (National Company for Water and Electricity) in 2001. It ensures the generation, transmission, distribution, purchase and sale of electricity in urban areas. It currently manages thirty urban centers. It is governed by a program contract binding it to the state, which forced it to improve its performance in return for a compensation of its operating deficit in the absence of equivalent tariff adjustment. The Company is 100 per cent owned by the State, the General Director is nominated by the President of the Republic; the board consists of deputy General Director, seven directors and fourteen advisors.

[7] Electricity Code, Art.

Agency of universal access to services (APAUS)

Agency of universal access to services (APAUS) was established in 2001 to promote universal access to regulated services (telecommunications, electricity, water). It ensures the project management of most of the rural and semi-urban projects in the areas of water and energy. The APAUS was otherwise has the task of monitoring the impact of the National Strategy for Universal Access in 2005.

The Universal Access Services Agency is an independent body with legal personality and financial autonomy (Ordinance No. 2001-06 of 27 June 2001 that created it).

The accounting legal system, financial, tax and customs of the Agency are specified by the provisions of Ordinance No. 2001- 06 of 27 June 2001 on its creation.

The agency is subject to a general system of private law in accordance with Decree No. 2002-06 of 7 February 2002 setting out its organization and functioning.

ADER

The Agency for Development of Rural Electrification ADER , created in 15 February 2000, is a Mauritanian private law agency governed by the law of 64 -098 of 9 June 1964 and state-approved by the Decree No. 2001-065 of 18 of June 2001, issued by the Council of Ministers. ADER mission is to coordinate and facilitate the process of decentralization of the rural area electrification.

An agreement was signed between the ADER and the government on 11 May 2000, pursuant to this agreement the programming and implementation of the National Rural Electrification Program are entrusted to the ADER. The areas of intervention of the Agency are as follows:

- The programming of rural electrification investments
- The delegated project of rural electrification projects
- Managing a Decentralized Electrification Fund FERD
- Management of rural electrification equipment;
- Identifying and supporting the emergence of private operators that can support the management and maintenance of decentralized electrification equipment;
- The experimentation of technical courses for electrification; and
- The training of actors of rural electrification.

For this ADER has acquired the human resources to become a structure capable of implementing and managing rural electrification equipment. ADER considers that it is the only national structure with the accumulation of experience and expertise in the management of rural electrification[8].

SPEG

To compensate for the large deficit into electrical energy and reduce the cost of electricity currently produced by individual power plants, the state, in July 2012, agreed with the main mining operators (SNIM and Kinross Gold) and the public electricity operator SOMELEC, to

[8] Ader.mr

create the Society of electricity production from Gas - SPEG, commissioned to build or promote an integrated system of production and transport of electricity generated from domestic resources gas.

SPEG (Société de Production d'Electricité à partir du Gaz) is a special purpose vehicle incorporated for the purpose of power generation, transmission and sales of power using Banda gas. SPEG's shareholders are SOMELEC (40%); KG Power, subsidiary of Kinross, an international gold mining company (34%); and SNIM, the national iron ore mining company (26%)[9]. Following the withdrawal of Tullow Oil, the SPEG was liquidated in 2015.

Private Operators

Since 2007, local private operators recruited by the MRA tender manage 19 rural centers (2014) and operating loss is compensated by the state, under delegation contracts Public Service Electricity.

SNIM (National Company for Industry and Mining)

Miferma (Mines de Fer de Mauritanie) was created in 1952 to exploit iron ore deposits in the Kedia d'Idjil area of northern Mauritania. A mining centre was constructed at Zouerate together with port facilities at Nouadhibou on the Atlantic coast, both with power plants and linked by a 700km railway.

Nationalisation of the Miferma consortium in 1974–75 created SNIM (Société Nationale Industrielle et Minière). The Mauritanian government now owns 78% of SNIM and Arab financial and mining organizations own the balance. Production rapidly grew to 12–13Mt/y, a level which has generally been maintained by serial upgrading of the facilities.

SNIM always ensures the electrical public services to the city of Zouerate and the electricity production for the needs of its industrial facilities in Nouadhibou, being served in part by a medium-voltage line from the city of F'derick.

Independent Producers of Electricity:

Mining Companies (SNIM; Kinross Taziazt, MCM): Some of the Mining companies conduct electrification in the villages which they depend. They also reflect on the possibility of reducing their operating costs through increased use of renewable energy to meet their needs outside the network.

Other key stake holders:

A number of NGOs, including international ones, are involved in the sector and lead to both awareness and demonstration projects for the possible use of these resources, especially in rural areas.

[9] http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/05/13/000442464_20140513092605/Rendered/PDF/830250PAD0P107010Box385211B00OUO090.pdf

1.4. Energy industry regulation

Law No 2001-18 on the multi-sectorial regulator. The law created an independent multi-sectorial regulatory authority named "Autorité de Régulation". The Regulatory Authority is charged with the regulation of the activities performed in the territory of Mauritania in water, electricity, telecommunications, mail among other sectors.

Ordinance No. 2001-06 establishing the Promotion Agency of Universal Access to Services

The objective of this Agency is to fulfil the directives of the Strategy of Poverty Reduction adopted in the Strategic Framework for the Fight against Poverty (CSLP). The Law confers the task of implementing a progressive policy of generalization of essential services decisive for the economic development and social well-being, such as water, electricity and telecommunications.

Provisions in favor of developing public-private partnerships (PPP) for providing public services are found in the context of the infrastructure sector reform[10].

Law No 2001-19: The electricity code provides for:

- The liberalization of the electricity sector;
- The harmonious development of electricity supply under the legislation;
- The creation of economic conditions for the return on investments in the power sector;
- The development of the consumption of electrical energy for all sections of the population and industry;
- The conditions for a just and fair competition and the rights of users and operators.

The order 05-2002 of 28 March 2002 defining the general organization of the downstream oil sector;

This Code governs the activities of the production, transmission, distribution, sale and purchase for resale of electric energy for the territory of the Republic Islamic of Mauritania. Are excluded from the application of this Code field:

- Power plants with an installed capacity below 30 Kilovolt ampere (kVA);
- The central military installations.

The Regulatory Authority, in accordance with Law No. 2001-18 on the regulation multispectral, ensures the application of this Code and in particular the implementation of allocation procedures and implementation of licensing and authorization conditions objective, transparent and non-discriminatory.

1.5. Energy prices

Despite increasing diversification, the Mauritanian energy system remains heavily oil dependent either on or off the network. Moreover, the country's geography and population and

[10] http://www.acces.mr/index.php?option=com_content&view=article&id=41&Itemid=20&lang=fr

economy centers do not facilitate the development of the national power market. All this affects the production costs of electricity and tariffs.

1.6. Power Prices

Electricity tariffs are set by decree. The tariffs applied by SOMELEC can be distinguished as on and off-grid in moughatas (Head locations); and off-grid tariffs proposed by the companies of service.

Table 5 Tariffs SOMELEC

Voltage	**Category**	**Slice**	**Tarifs en vigueur**	
			Énergy Price (€/kWh)	**Monthly Fixed premium (€)**
Low Voltage (LV)	Domestic	D1	0,095	8,30
		D2	0,145	36,23
		D3	0,145	110,71
	public lighting		0,14	105,82
	Industries, craft and Commerce	1	0,145	8,30
		2	0,14	36,23
		3	0,145	110,71
	Administration	I	0,14	36,23
		II	0,145	181,19
Medium Voltage(MV)	1 tariff provision		0,09	10,24
	2 tariff provision		0,06	184,58
			0,06	

Source: SOMELEC (1€=**380 MRO)**

Off-grid tariffs for service companies and maximum tariffs are set by Decree of the MPEM. The prices are applied by service companies according to each service area, following the rates proposed by the MRA and the MPEM.. The Multisectoral Regulatory Authority (MRA) evaluates quarterly the subsidy to each Department. This grant is punctured on the Fund Universal Access (FAUS) managed by the APAUS. Thus, the State through the ARM and via APAUS (FAUS) reverses operating subsidies necessary to ensure the economic sustainability of delegates.

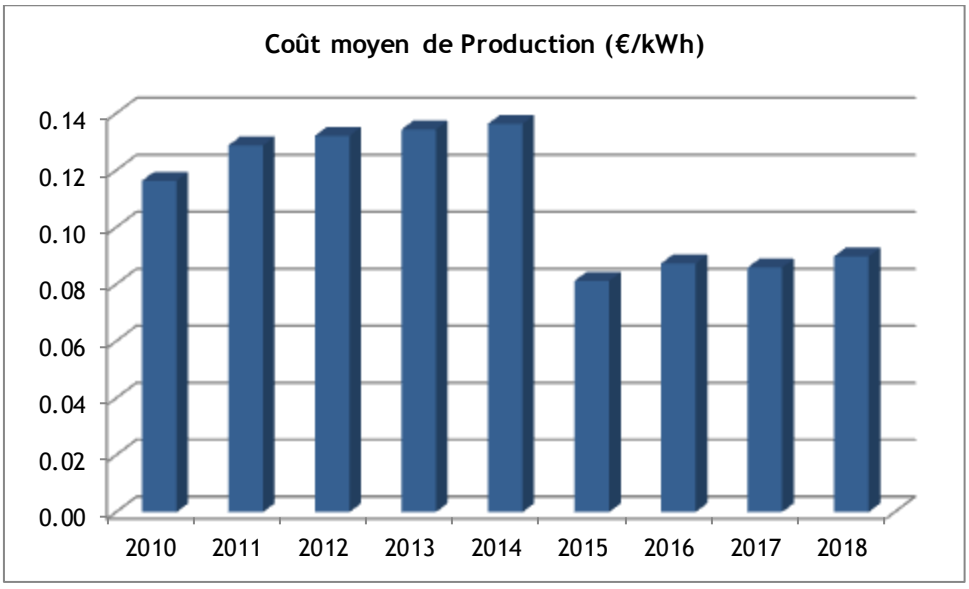
Table 6 Grid existing tariff and proposed for on and off-network

On and off-grid for SOMELEC		Off-grid network (suppliers)		
The Tariff	**Monthly proposed Tariff**	**Social Tarriff < 25 kWh/month**	**Medium Tariff Between 25 kWh and 120 kWh**	**Higher Tarif > 120 kWh/month**
Fixed premium: 329 UM (0,82 €) Énergy Price: - <2 kVA : 30,74 UM/kWh (0,077 €) - > 2 kVA : 59.03 UM/kWh (0,148 €)	Énergy Price Social : 36,01 UM/kWh (0,095 €) Higher : 59 UM /kWh (0.145 €) Medium Voltage : 37 UM/kWh (0.09 €)	Fixed premium 600 UM (1,5 €) Énergy Price 51 UM/kWh (0,13 €)	Fixed premium: 1 625 UM (4,07 €) Énergy Price 81 UM/kWh (0,20 €)	Fixed premium : 7 513 UM (18,81 €) Énergy Price 90 UM/kWh (0,23 €)

Source : Study Tariff SOMELEC;
"Joint Order 2418, MHE and MCI fixing the maximum sales price of electricity in the communities that are the subject of the delegation of the public electricity service June 23, 2008";
1 Ouguiya = 0.00250428 Euro 1 = 0.00343770 USD Ouguiya

Rates, whether on or off-grid are subsidized. Graph below shows cost of production of kWh from 2010 with projections till 2018.

Table 7 – Cost of production



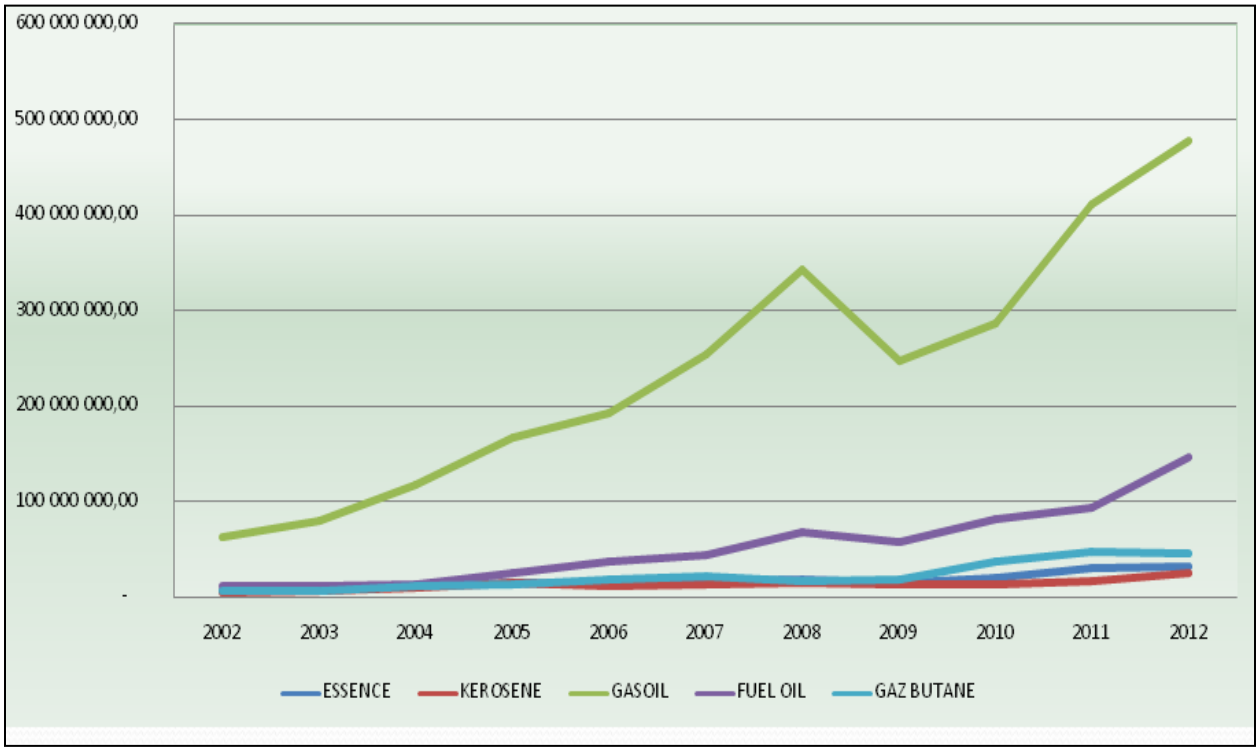
Source: APAUS

Oil Prices

The supply of liquid petroleum products and gas for the country is provided by international suppliers selected according to the government' calls, every two years. The prices of the energy products are two folds:

- Rates given for products distributed to the public.
- Free rates for large consumers and fishing;

Table 8 Energetic share on state budget, 2002-2012



Source: *Office of National de Statistics(ON S)*[11]

The oil bill remains high; it is estimated at MRO 204.5 billion, marking an increase of 39% compared to 2011. Excluding mining companies, imports of petroleum products totalled MRO 123.8 billion or 60% the oil bill in 2012, registering a slight decrease from the 2011 level of 62.9%. Regarding the mining companies, their spending on petroleum products increased 48% from $ 54.7 billion in 2011 MRO to MRO 80.7 billion in 2012.

In the past, operators suffered significant loss of earnings due to the lack of coverage of their costs through tariffs in administered prices. These shortfalls exceeded at times the bar ten billion UM. In recent years, the Ministry has launched a reimbursement program for operators of their shortfalls on one hand, and by a gradual adjustment of tariffs to cover the economic costs. Today:

- Most of the shortfall was reimbursed to the operators;
- Tariffs cover the economic costs allowing the state to save significant amounts were allocated annually to the liquid petroleum products of price subsidy.

[11] Office National de Statistique. www.ons.mr

1.7. Recent development and the structure; outlook and its structure

Mauritania has offshore oil reserves estimated at 1 billion barrels. As in most African countries, traditional fuels are an important source of energy. However, unlike most other Sahel countries, Mauritania also relies heavily on petroleum products which supply 95% of the country's commercial energy needs. The main petroleum fuel product is LPG (liquefied petroleum gas) and together with Senegal and Cape Verde, these countries represent 90% of the regional gas market. Diesel oil represents 25% of petroleum use in Mauritania.[12]

Total primary energy supply was in 2008 estimate at 1,495 ktoe, having 59% biomass and 41% of Petroleum products.

The total primary energy production in 2012 was estimated at 0.015 Quadrillion Btu and the total primaty energy consumption in the same year was estimated at 0.038 Quadrillion Btu.

Production

Apart from hydropower, the photovoltaic solar plant of 15MW in 2013and the wind power plant of 30 MW which entered into production in 2015; the production of SOMELEC comes from thermal Diesel (fuel oil and diesel).

The most important power plants in the country are situated in Nouakchott (180 MW started production in late 2015). those of Arafat Nouackcott, the modular power plant of Wharf 36 MW and that of Nouadhibou 22 MW since 2012..

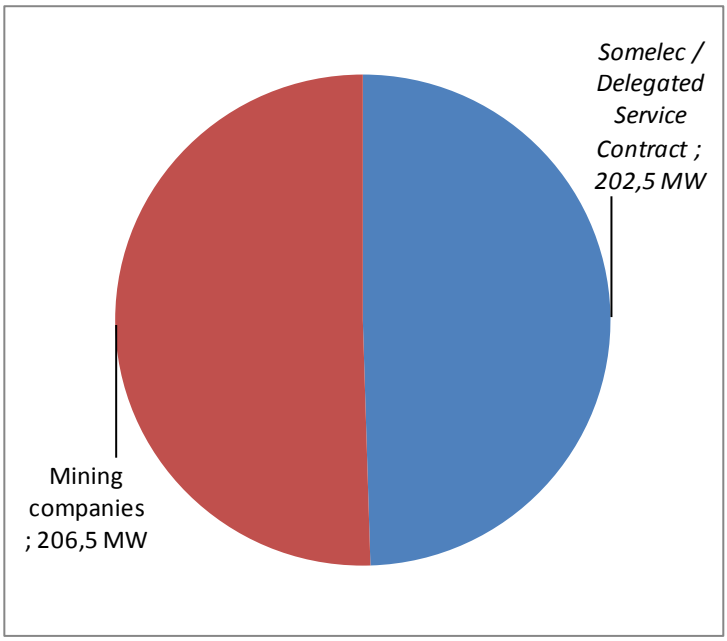
This installed power capacity generated 740 Gwh in 2014.

The same year, SOMELEC imported 182GWh from hydroelectric dams of Manantali and Felou owned by the OMVS, 173 130 MWh.

Major mining companies have a significant production capacity to cover their own needs from electricity amounting to 560 GWh.

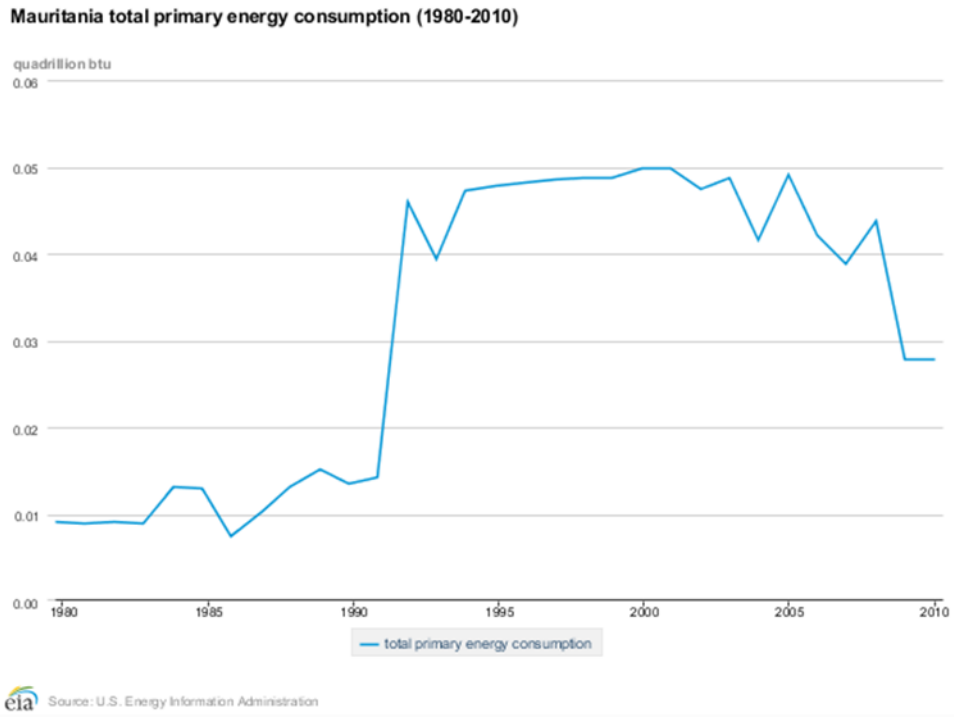
[12] http://www.reegle.info/countries/mauritania-energy-profile/MR#sources

Figure 2 Installed Capacity



Source :MPEM

Figure 3 Gross domestic consumption of energy, 1980-2010



Consumption

The annual primary energy consumption in the country was estimated at 4.8 million barrels of oil equivalent in 2010 (EIA). The annual consumption per capita is 0.3 toe, and 0.17 toe without traditional biomass. Mauritania's energy mix is made up of approximately 67% biomass (wood and charcoal), followed by petroleum products. In other words, petroleum products represent the vast majority of commercial energy used in the country. The power consumption increases by more than 10% per year, whilst less than 5% of the population in rural area has access to electricity[13].

Table 9: Gross domestic consumption of oil product, 2000-2011

OIL PRODUCTS CONSUMPTION 2000 - 2011

Units: Thousands of tons

	Products / Years	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
ORDINARY	CUMUL	26.01	22.30	24.33	26.90	26.90	25.4	20.2	22.3	19.837	23.949	25.00	12.70
	GPP						23.9	19.0	20.72		22.019	23.7	12.1
	SNIM sem						1.5	1.2	1.58	1.852	1.93	1.3	0.6
FUEL OIL	CUMUL	83.7	78.7	80.1	76.1	76.5	99.0	107.5	112.2	130.55	137.53	159.80	83.70
	Somelec	31.9	27.1	26.3	24.1	24.2	40.0	40.8	39.9	59.6	58.2	61.7	30.8
	Snim(Mines)	50.8	49.8	51.8	49.8	50.6	56.5	63.4	61.7	59.2	60.0	63.0	31.5
	Industries + TP	1.0	1.8	2.2	2.2	1.8	2.5	3.3	10.6	11.7	19.4	35.1	21.4
KEROSENE	CUMUL	20.1	18.9	21.4	23.1	24.4	26.0	17.5	17.4	15.34	20.57	17.60	8.30
	Pétrole	0.3	0.2	1.3	0.8	1.3	0.9	0.8	0.4	0.5	0.7	0.4	0.5
	Kerosene	19.9	18.7	20.1	22.3	23.1	25.1	16.7	17.1	14.9	19.9	17.2	7.8
GASOIL	CUMUL	222.4	246.8	277.4	289.2	317.2	308.0	308.3	384.9	392.81	429.27	445.69	220.28
	Péche indust	54.6	56.0	56.0	58.6	68.3	61.3	51.2	54.0	42.2	45.1	41.09	24.08
	Péche Artisan	3.1	3.7	5.2	4.2	3.9	4.9	6.9	8.1	1.5	2.0	1.6	1.5
	SOGEM- ENERMALI									38.5	39.3	38.8	0.0
	Transport/TP/INSDUST	99.7	107.6	136.8	158.0	171.4	171.4	178.2	240.4	223.3	256.9	266.5	145.9
	Somelec	16.4	30.9	31.5	18.3	23.5	17.9	18.9	26.6	25.4	28.0	37.5	18.7
	Snim	48.6	48.6	47.9	50.1	50.1	52.6	53.1	55.8	61.9	58.0	60.2	30.1
	Divers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0
CUMUL HYDOCARBURE LIQUIDE		352.2	366.7	403.2	415.3	445.0	458.4	453.4	536.8	558.55	611.32	648.09	324.98
GAZ BUTANE	SOMAGAZ	17.4	18.1	18.5	23.1	23.6	29.2	30.2	29.4	32.5	39.5	29.06	14.50
	BSA GAZ										7.4	7.8	3.9
CUMUL GAZ											46.9	36.9	18.4
CUMUL GENERAL HYDROCARBURES RAFFINES		369.6	384.8	421.7	438.4	468.6	487.5	483.6	566.2	591.0	658.2	685.0	343.4

Source: *Office of National de Statisque (ONS)*[14]

The levels of access to energy services are limited in the country. Significant efforts are devoted to rural electrification, but the vast majority of the population is still dependent on non-commercial resources for their needs (64% of the primary energy consumption provided by traditional biomass). The resources used to produce electricity, the main imported today. In spite of the national crude oil production is exported, all petroleum products are imported in the absence of local refining capacity. The local gas exploitation will reduce the country's dependence, but retrieval time could have important consequences on the economy[15].

[13] RRA
[14] Office National de Statistique. www.ons.mr
[15] RRA

Table 10 Forecast for Demand Balance (in MW):

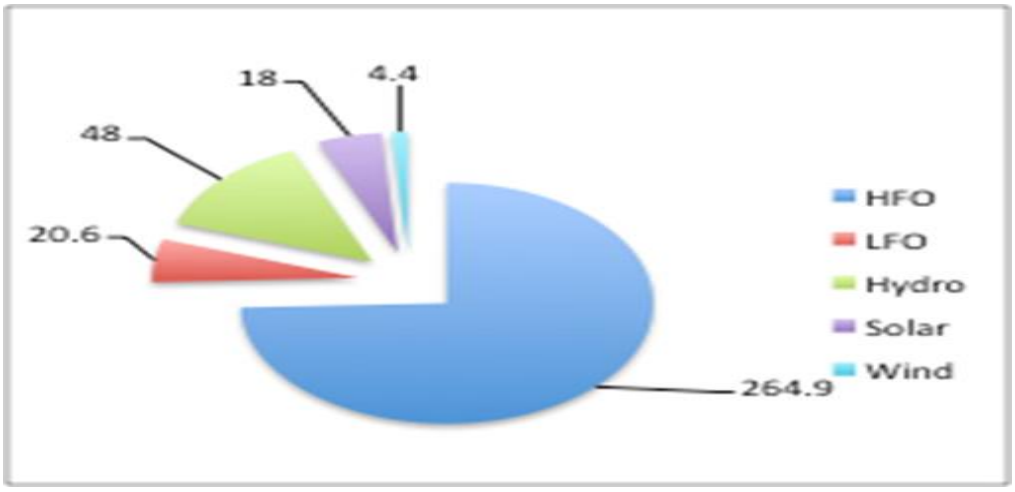
Année	Interconnecté - Sc. moyen	Interc. + Mines - Sc. moyen	Interconnecté - Sc. Haut	Interc. + Mines - Sc. Haut	Interconnecté - Sc. Bas	Interc. + Mines - Sc. Bas
2015	129	461	143	475	102	229
2016	144	476	161	494	110	432
2017	156	569	174	588	136	468
2018	170	784	188	802	149	482
2019	184	798	203	818	160	573
2020	196	811	220	835	172	786
2021	208	1 319	237	1 347	183	798
2022	222	1 333	255	1 366	192	808
2023	236	1 347	275	1 385	202	818
2024	251	1 362	295	1 406	212	828
2025	267	1 377	318	1 429	223	838

Source: MPEM

1.8. Electricity System, Production, Transmission and Distribution

Generation: The main resource used today for electricity production is heavy fuel oil, which represents 75% of installed capacity (just over 350 MW in 2013) of power plants. Excluding demand projections in terms of electrical capacity, an increase in demand is predicted (network and mining) from 220 MW in 2013 to nearly 1400 MW in 2025, in this scenario "high" is a multiplication of the installed capacity by 6. Note that 75% of this capacity is linked to the demand of the mining sector (1,050 MW in 2025)*. (See the Future Development Section)

Figure 4: installed electrical capacity (MW) (Somelec, Delegated Service, Private



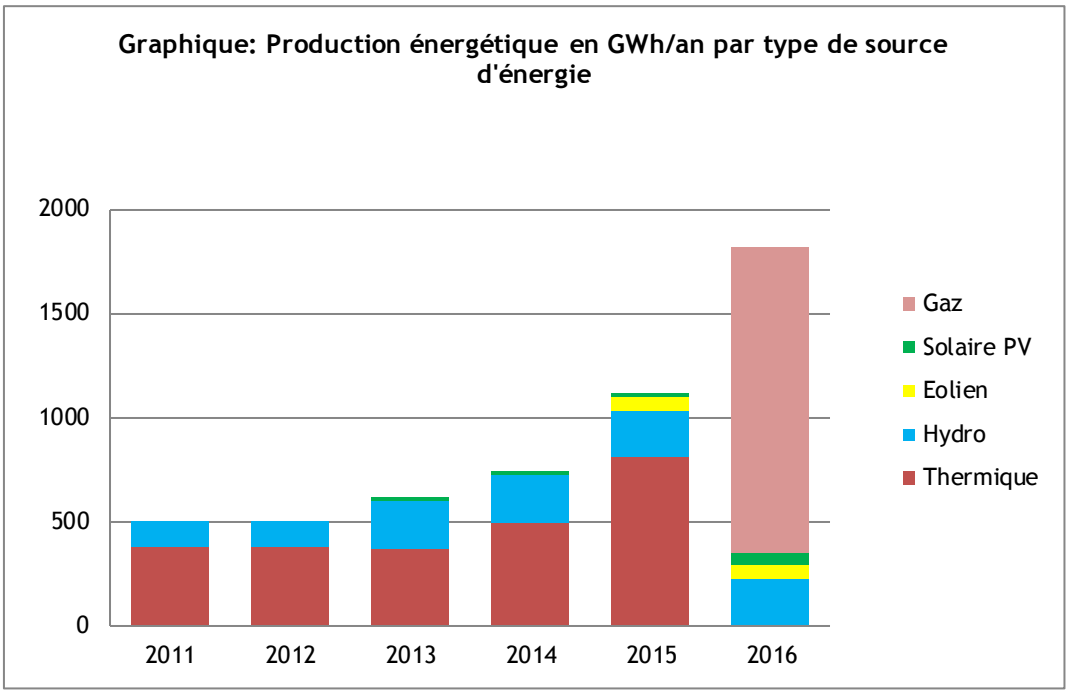
Source : *MPEM*[16]

The plans are to have, in 2020, a total of 376 MW of power generation capacity comprised from 89.25 MW of hydropower, 241.75 MW of heavy fuel oil and mixed power and

[16] Master Plan Generation and Transmission Electric Energy in Mauritania between 2011 and 2030; intec; November 2012.

58.3 MW of solar and wind. There is around 36% of total renewable capacity connected to the network. Between 2020 and 2030, a number of hydro power projects are to be built, totaling 217.25 MW of capacity. The oldest plants to be decommissioned are HFO and gas combined cycle power plants in service, totaling 354 MW of capacity without new additions provided on the renewable network outside of hydraulics. This would bring the total capacity to an overall of 41% renewables (34% hydro) and 59% of fossil fuels.

Table 11 Energy production according to source (GWHh)



Source : APAUS

Figure 5 Available sources of power status

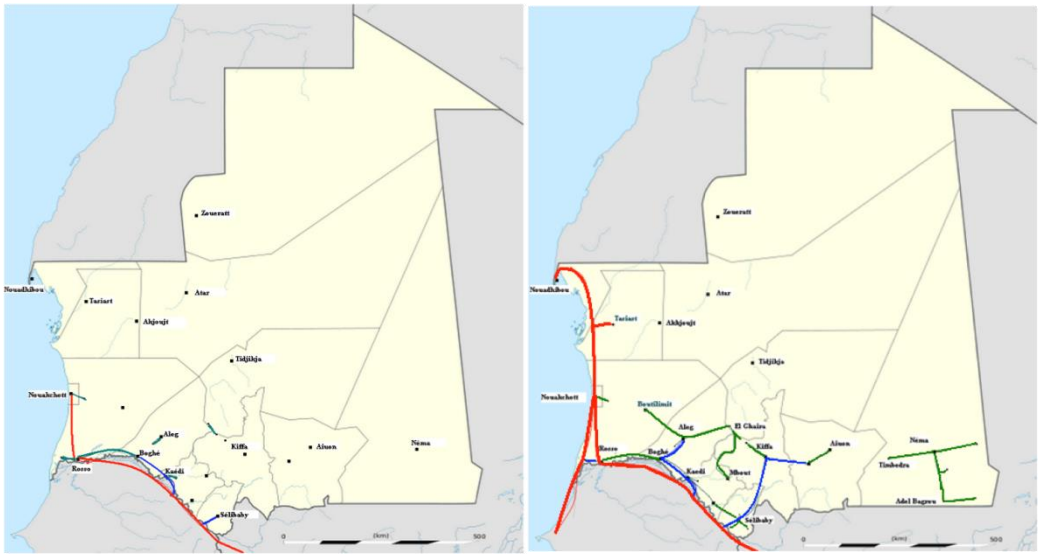
Name	Type of plant	Available power	Year of commissioning	Last year provided
Manantali	Hydroelectric (available power for Mauritania)	30	2002	2030
Félou		18	2013	2030
Gouina		35	2016	2030
Gourbassi		6.25	2017	2030
Bouréya		40.25	2021	2030
Koukoutamba		70.25	2023	2030
Badoumbé		17.5	2025	2030
Total Hydro		**217.25**		
Arafat 1	Heavy Fuel (HFO)	39	2014	2023
Arafat 2		8.75	2011	2020
Wharf		36	2011	2014
Nouadhibou		22	2013	2030
Total Heavy Fuel		**105.75**		
Duale 1	Mixte HFO/Gaz (114)	120	2015	2030
Duale 2		54	2018	2030
Total Mixte		**174**		
Total Gaz CCG	Combined Cycle Gaz	**180**		
Wind Nouakchott	Wind	30	2014	2030
Solar Nouakchott	Photovoltaic	15	2013	2030
Solar 2 Nouakchott		30	2015	2030
Total Renewable		**75**		

Source: Master Plan Generation and Transmission Electric Energy in Mauritania between 2011 and 2030; intec; November 2012.

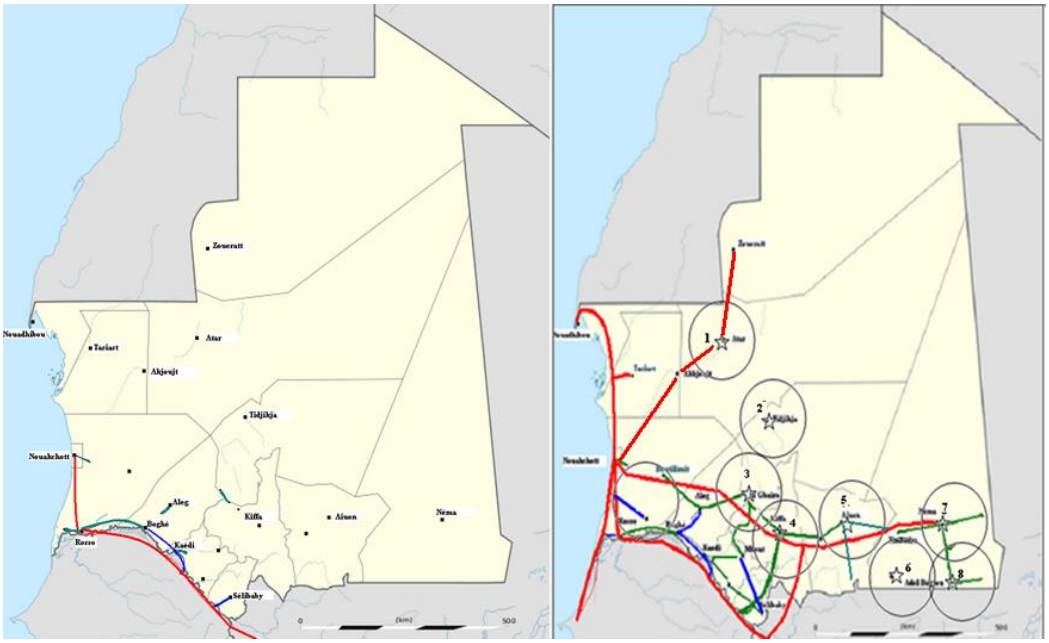
Transport and distribution

The Mauritanian power transmission grid is built around the main demand centers. A 225 kV line along the coast south to Rosso then along the border of the Senegal side and join the OMVS network from Dagana. Transmission along the border is provided by a 33 kV line (green SOMELEC) Rosso Boghé up and 90kV (blue OMVS) Boghé to Matam.

Figure 6 Network Transmission Mauritania 2013-2018



Source: *Minister of Petroleum, Energy and Mines*



Sources : MPEM

The transmission network is expected to expand. First, two draft lines 225 kV (red) are additionally planned under the operation of Banda Gas field, one extending the transmission network to Nouadhibou in the north (as well as areas mining inside the country), the other going to Senegal to allow the export to Senegal. Network extensions 90 kV and 33 kV are also planned to the south of the country to increase the proportion of population served.

Electricity access rates are quite low in the country this is partly due to the difficulty of extending the network and the dispersed nature of demand, not facilitating interconnection. Overall, it is estimated that the number of households connected to the network increased from 22% in 2000 to 24% in 2004 to 34% in 2013.

2. MARKET STRUCTURE BY SUB-SECTORS

2.1. Oil

Apart from mineral resources, Mauritania has potential in oil and gas reserves. The Western African Resource Watch estimated oil reserves of the country at 1 billion barrels, which would place it just behind Nigeria.

Oil fields, exclusively for export, as Chinguetti saw output fall by 70,000 bbl / d in 2006 to 6 143bbl / d in 2013. This production uncertainty may be partially related to the small number of known resources. Indeed, to this day the country is still under-explored, there are 1.7 wells per 10 000 km2 in the license areas in comparison to an average of 50 wells.

Table 12 Offshore Discoveries[17]

Fields	Nature of hydrocarbons	Estimated reserves	Position/Depth	Operators
Thiof	Oil	230 M barrels	100 Km/ 1400m	OPEN[18]
Thévet	Oil	30/40 M barrels	70 Km /600 m	OPEN
Banda	Gas/Oil	2 TCF	55 Km/ 214 m	OPEN
Pelican	Gas	1.1 TcF	160 Km /1700 m	DANA
Lebeida	Oil	30/50 M barrels	95 Km /1265	OPEN

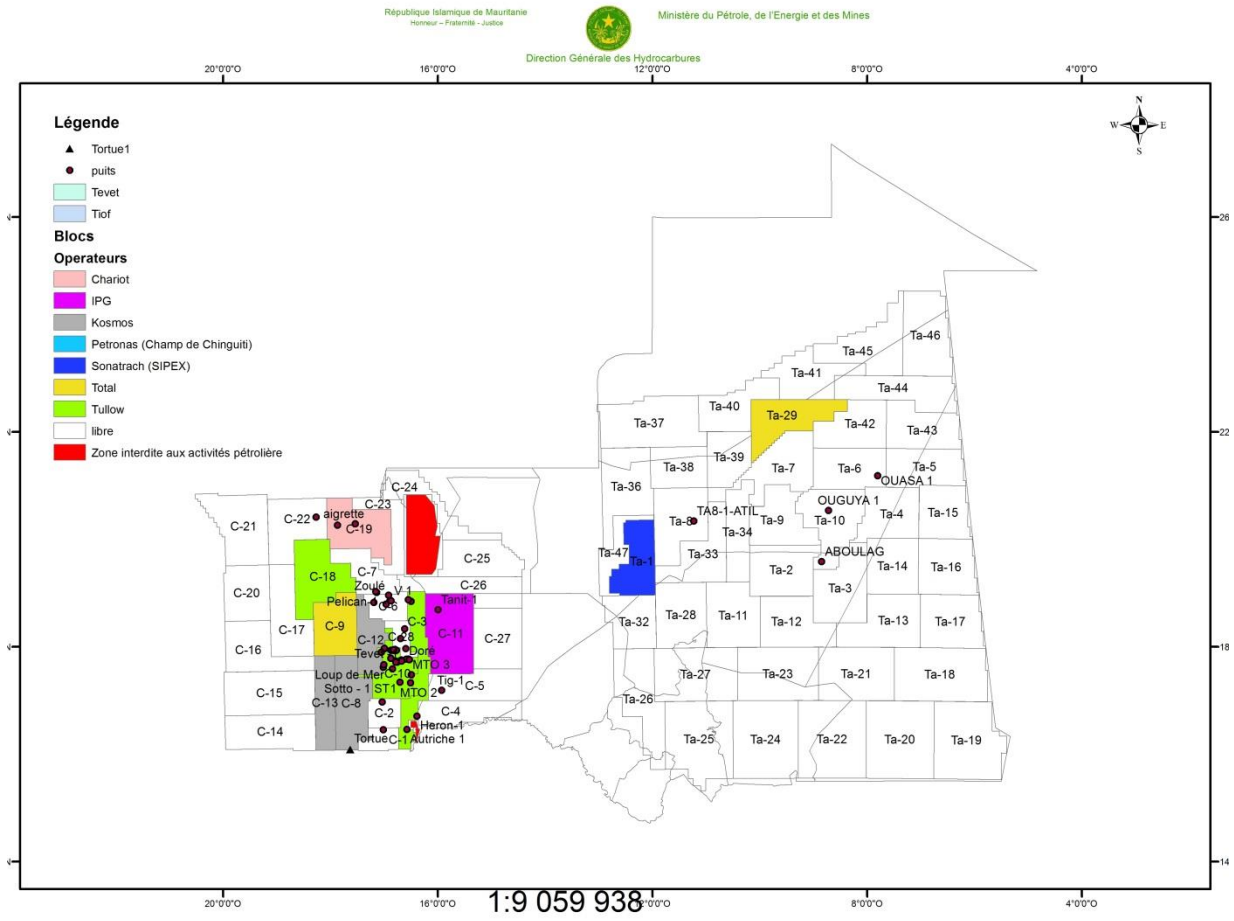
The oil and gas resources potential are still largely unexplored in Mauritania. However, since 2001, a number of new oil deposits were discovered and production started in the fields, such as the *Chinguetti* field, at a water depth of 800m, discovered in 2001, which has, according to its operators, a current production of around 8,000 barrels per day; the *Banda* deposit which is estimated to contain approximately 1.2 TCF of natural gas with an oil ring; the *Tiof* deposit which should contain 120 million barrels of oil with associated gas, having been discovered in 2003; the *Tevet and Pelican (southern part of block 7) deposits* are still in the evaluation stage, the *Cormorant* drilling (2010) revealed the existence of gas beyond the previously defined limits; and, finally, in the Onshore drilling "Tanit-1" produced by TOTAL in 2010, extremely encouraging results have been achieved on the hydrocarbon potential in the Basin Taoudeni[19].

[17] Study on the integration of the oil and gas sector to the national economy/ Bureau d'etude Pétrostratégie 2008;P30

[18] These discoveries became a State patrimony; thus they are open for investors.

[19] Guide de l'investisseur minier – Octobre 2013

Table 13 Key Operators in the field of exploration and production[20]



Source: Ministry of Energy

2.2. Gas

Banda Gas Field

The Banda Gas field, whose reserves are estimated at 1.2 Tcf, should go into production by 2017. The operating early depends on the finalization of the gas utilization negotiations initiated under the SPEG (Production Company of Electricity from Gas). Indeed, the gas reserves in the Banda field do not justify the construction of gas liquefaction facilities in order to export it to a global level or to build a pipeline in order to connect to the network WAGP (Western African Gas Pipeline) or to export to Morocco.

The Banda gas field is located approximately 55 km offshore of Nouakchott. The Banda field shareholders are Tullow (67%), Petronas (15%), Kufpec (13%) and Premier Oil (5%). Tullow prepared a field development plan which provides for production of up to 70 mscfd per day of gas over 20 years. The Banda Gas Project consists of two sub-sea wells tied back to an onshore gas processing plant via a subsea production manifold and a 10-inch sub-sea pipeline.

[20] MPEM 2014

Project cost is estimated to be US$650 million. The gas field was declared commercial in September 2012 and the environmental impact assessment (EIA) and front end engineering and design (FEED) were completed in the first half of 2013. Tullow Oil eventually withdrew in December 2014, for lack of financing capacity given the situation of the oil market. A new investment model is being structured.

The decision was taken to use the gas for electricity generation to be used for domestic consumption by mining companies (part of the capital of the SPEG), whose surplus would be exported to the space OMVS.

The Banda Gas-To-Power Project

The Banda Gas-to-Power Project consists of the following components:

a) the upstream Banda offshore gas field production, transmission and processing infrastructure (the Banda Gas Project);

b) power generation from Banda gas in Mauritania (the SPEG Power Project); and

c) existing and new power transmission lines to evacuate power to the delivery points. SPEG (Société de Production d'Electricité à partir du Gaz) is a special purpose vehicle incorporated for the purpose of power generation, transmission and sales of power using Banda gas. SPEG's shareholders are SOMELEC (40%); KG Power, subsidiary of Kinross, an International gold mining company (34%); and SNIM, the national iron ore mining company (26%).

The SPEG Power Project: downstream power generation

The SPEG Power Project is designed to be implemented in two phases to match the evolution of electricity demand in Mauritania – and also in the region – and to optimize capital allocation.

The proposed WBG intervention is focused on the first phase of the SPEG Power Project which consists on the construction of a 300 MW power plant located in the north of Nouakchott that will operate using Banda gas. The SPEG plant includes 180 MW dual fuel engines (HFO, natural gas) to be commissioned by March 2015, and 120 MW combined cycle gas turbines (CCGT) to be commissioned by mid-2016. The 300 MW SPEG plant will sell all its generation to SOMELEC, who will, in turn:

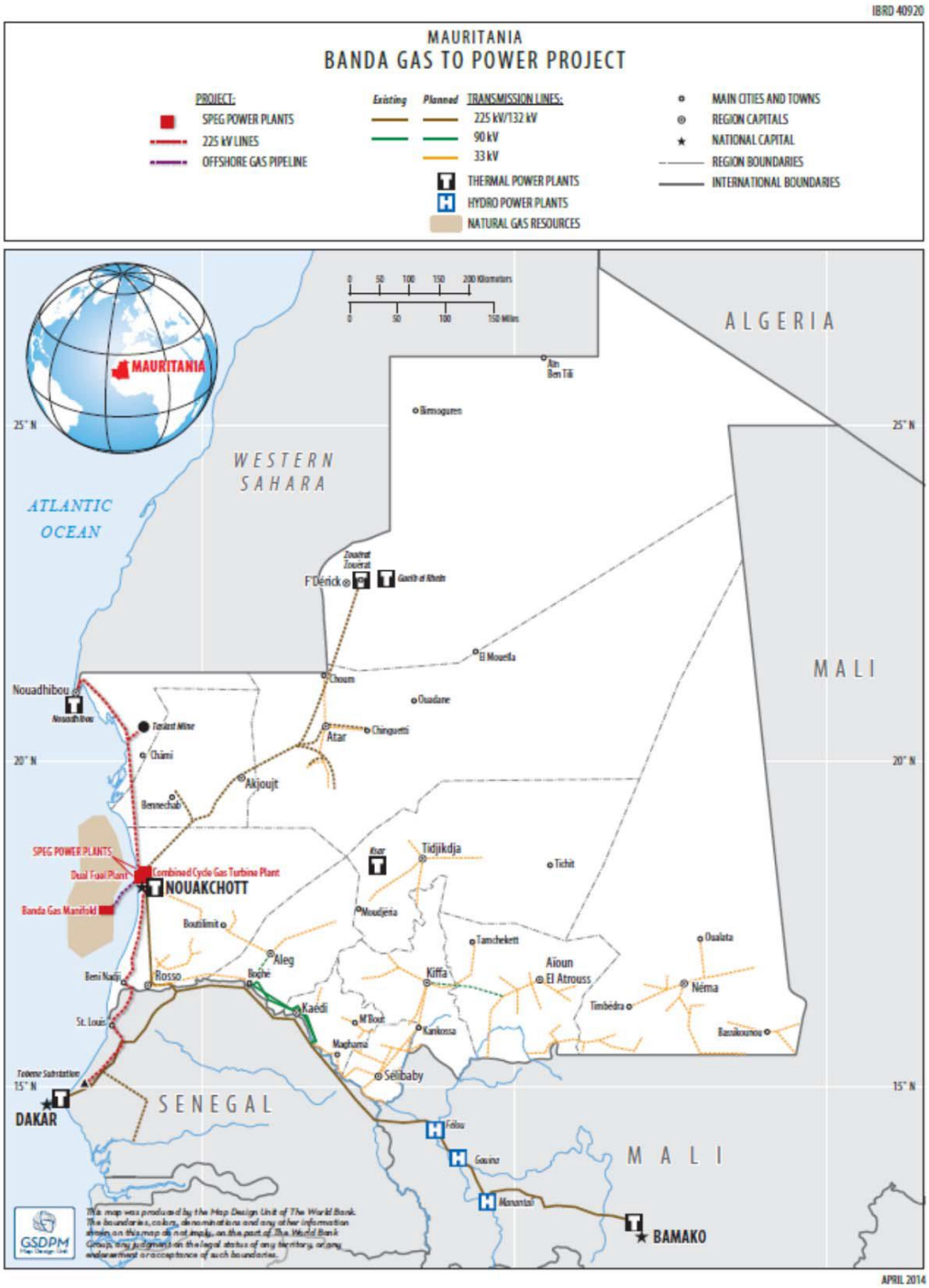
a) sell power to Kinross, SNIM and its regular customers in Mauritania; and

b) export power to Senegal (SENELEC) and Mali (EDM).

Gas from the Banda offshore gas field developed by private developer Tullow will be sold to SPEG which will transform the gas through a 300 MW power plant. The SPEG electricity

will be sold to Mauritania's national utility, SOMELEC, which in turn will sell power to customers in Mauritania and export power to Senegal and Mali[21] .

Figure 7 – Mauritania Banda Gas to Power Project



Source: Ministry of Petroleum, Energy and Mines

[21] THE BANDA GAS TO POWER PROJECT Document of The World Bank Group Report No: 83025 - MR

2.3. Electricity Power (See Section 2.2: Power System, Production, Transmission and Distribution)

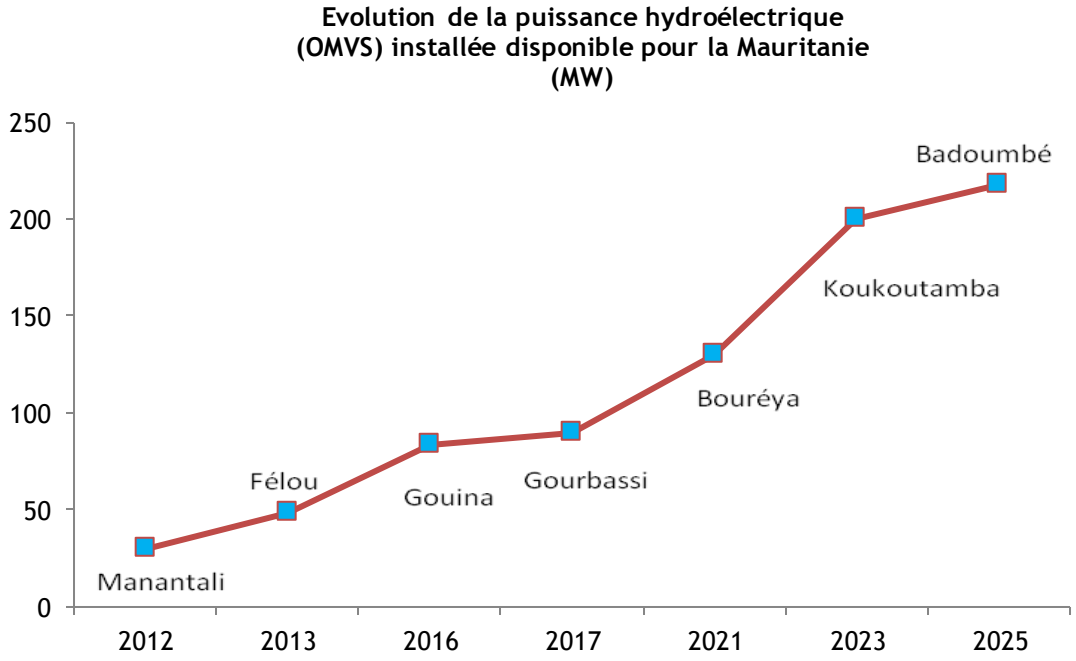
2.4. Renewable Energy Sources

Mauritania is at a critical point in its energy development. A number of options have been taken to ensure electricity supply to price content through the operation of the Banda gas field. Nevertheless, the country benefits from important renewable resources that can contribute to the development of a substantive, economic and competitive energy supply. The country already has the Senegal River water resources through the OMVS[22]. Moreover, wind and solar resources are highly significant, while traditional biomass still meets the majority of the primary energy consumption.

Hydro potential

Mauritania has limited water resources. The main resources are related to the Senegal River. Mauritania is one of the OMVS and participates in projects within this framework.

Table 14 – Evolution of installed hydro potential

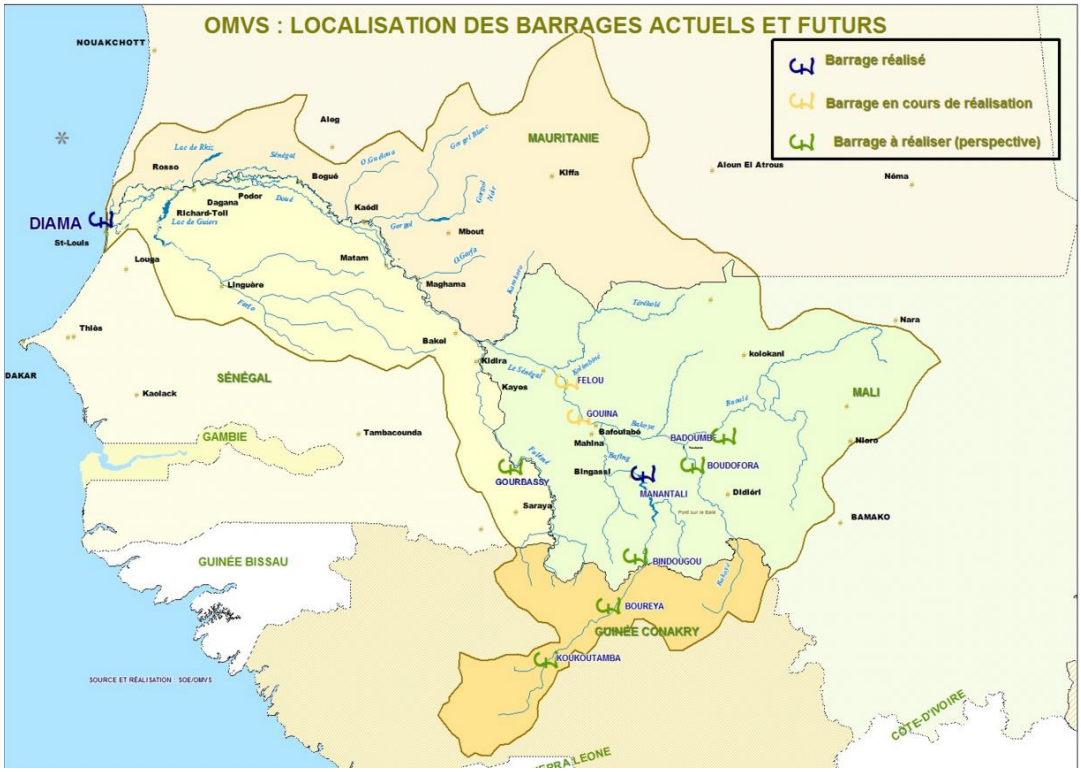


Source : APAUS

The two major projects currently in service are the Manantali dam, for which Mauritania has 30 MW of the 200 MW capacities available, and the Felou dam, for which the country has an available capacity of 18 MW. Mauritania should benefit nearly 217 MW over a little less than 690 MW of capacity planned for all projects OMVS planned. Apart from Manantali and Felou, the dams of Gouina and Gourbassi are those that should be achieved in the short term,

[22] Organisation pour la Mise en Valeur du Fleuve Sénégal (the Senegal River Basin Development Organization)

(by 2020). These projects are coupled to electrical interconnection projects for delivering energy produced on participating countries.



Map of hydropower stations (source: OMVS)

Outside of large projects planned as part of the OMVS, Mauritania has limited water resources in the south of the country that could actually be exploited. These resources are currently being investigated, but could result in a joint operation for irrigation and power generation. It is required to measure and promote the use of these resources in the country through the realization of studies and measurement campaigns of technical and economic potential for the construction of retention ponds / dams.

Solar

The sunshine in Mauritania is significant. There is radiation of about 4.9 kWh / m² to 6.5 kWh / m² per day on a horizontal surface (corresponding to 1800 to 2400 kWh / m² / year), with three different sun exposure regions in the country, as follows:

i. *North*: exposed to a desert climate, dry and hot;

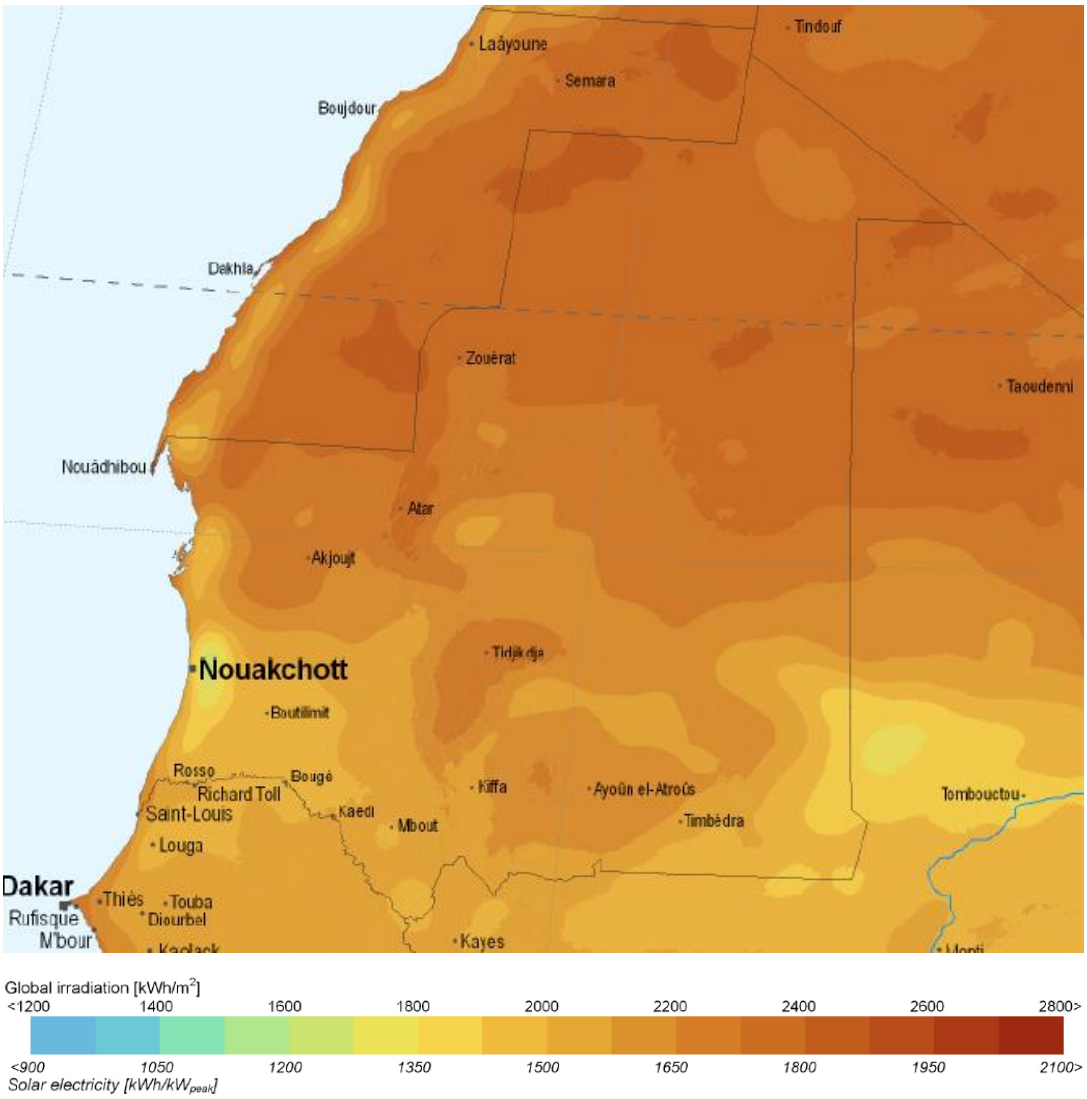
ii. *South*: subject to a more humid climate with lower solar exposure

iii. *Coastal*: zones exposed to lower temperatures but more moisture.

As illustrated in the map below, the radiation range varies between 1900 and 2000 kWh / m2 / year for a minimum and 2300 and 2400 kWh / m2 / year for a maximum. The map shows different areas of sunshine exposure, with a number of "hot spots" (with a higher radiation) potential in coastal areas[23].

Figure 8 – Solar Map of Mauritania

[23] RRA Renewable Readiness Assessment Stratégie Nationale de Développement des Energies Renouvelables



Source : PVGIS 2008 – EU, JRC – Ecole des Mines de Paris/Armines/CNRS

A number of measurements for different areas of potential projects can provide an estimative of productivity for photovoltaic technologies. These measures, on an annual basis, are estimated from direct and indirect radiation.

Direct and indirect radiation in Mauritania are significant. Current data is mainly from satellite measurements and need to be compared to ground radiation measurement in order to be better quantified. A number of pilot projects and measures undertaken in the 1990s could be used to refine the data, but the data is often not available or usable. In any event, different orders of magnitude are used to obtain an estimate of the potential available. The use of solar energy is explored along Mauritania. So far, the facilities are almost exclusively photovoltaic. Other applications such as power and solar hot water solar concentration are possible given the nature of the radiation, but remain as options to be considered. The on-site technologies are numerous but mainly intended for applications in a reasonable size (individual, collective). A panel frames assembly unit is also available on site with a limited production capacity.

Off-grid

Solar energy, until recently, was mostly been used in a decentralized framework. The Regional Solar Program (PRS) was one of the first large-scale solar programs implemented in the country. It mainly covered the use of solar photovoltaic systems for Supply Drinking Water (AEP) and was extended to the distribution of a number of community systems (lighting kits and cold). Approximately 210 water systems and community were implemented in both phases of the PRS 1 (1990-1998) and PRS 2 (2001-2007). Moreover, it is interesting to note that approximately 30% of the systems installed in the PRS 1 had to be rehabilitated at the PRS 2, stressing the need to properly design and maintain the units in place.

Agency participation in off-grip enterprises

ADER - Agency Development of Rural-Electrification, a Mauritanian association acting on behalf of the State, for its part, installed over 12,000 solar kits in as many homes throughout the country. The total capacity installed reached 309 kWc. ADER has since integrated the development of mini networks in their program.

The APAUS - Agency Promotion Universal Access to base-Services is a multi-sectorial public institution and principal actor in the rural areas of hydraulics and energy. It is also active in the field of solutions based on solar PV (solar kits and pumping hybridization fired power diesel used for some mini-networks and multifunctional solar platforms PTFM).

Size Projects Connected or Not connected to the network:

Large-scale photovoltaic projects are part of the country's goals. A 15 MW PV project was inaugurated in April 2013 in Nouakchott and primarily funded by a loan from Abu Dhabi. In addition, many projects are under study or in progress.

Several projects Hybrid Solar-Diesel Production coupled with the construction of 33 kV networks on not yet electrified zones are planned. The first project to be implemented is Kiffa plant that comprises 1.3 MW of solar and 4 MW of thermal energy. Others, alike, are expected for the coming years and will be implemented as the financing becomes available. For instance, the project Echargui Aftout, with a 2.6 MW capacity, including 200 km of 33 kV line, may be one of the next to be started, given that funding to the tune of $ 30.4 million have already been raised from the Islamic Development Bank (IDB) and the OPEC Fund for International Development (OFID)

Finally, projects to reduce fuel consumption not disconnected to the network industry are being examined. The first draft Zouerate 3 MW is in progress on behalf of SNIM and is set to open shortly.

Industry / companies / suppliers:

The recent development of the solar market, previously content to off-grid applications, has not helped to foster the emergence of a large number of businesses and skills in this area. Note that a panel mount unit “ATERSA Mauritania” with limited activity assembling frames and junction boxes already exists. At the moment, the market is not significant enough to justify the existence of a complete chain assembly. In addition, a number of private companies with experience on the delegation of energy services exist and might be able to

train to be able to ensure the upkeep, maintenance and potentially increase the number of solar power plants.

Mauritania high solar incidence as a resource can be considered competitive from an economic point of view with the fossil fuels currently being used (diesel HFO). The competitiveness of the solutions depends on the actual costs of providing energy on site. Unfortunately, the cost comparison is not simple, because of the difficulties in measuring the real costs of energy supply. In order to compare the actual costs of provision, it would be particularly necessary to calculate all the development funding obtained for each infrastructure.

The rural electrification projects based on solar energy are numerous in Mauritania, both for the electrification of villages through mini grids hybrid solar-diesel powered, installing solar platforms (PTFM) or for the distribution of solar kits. One still finds a number of recurrent issues that cover:

- Sustainability of systems: Once the projects implemented, economic viability depends on their funding capacity. Out today, the applicable tariffs only help fund the operation and a small part of the renewal remains primarily the responsibility of the State, the details have not yet been defined;
- maintenance of installed systems during and after programs; managing the pricing and funds collected from populations and differences in pricing between localities connected to the network belonging to communities managed by SOMELEC, managed by delegated services and solar platforms;
- pass required between off-grid communities and those that can potentially become connected but are not covered by SOMELEC. Indeed, common previously electrified by independent mini-network that could potentially be connected to the network today have no access to a lack of resources / forecasting SOMELEC which can meet network recovery requests;
- harmonizing tariffs between the localities served by SOMELEC and those served by the delegates of public service.

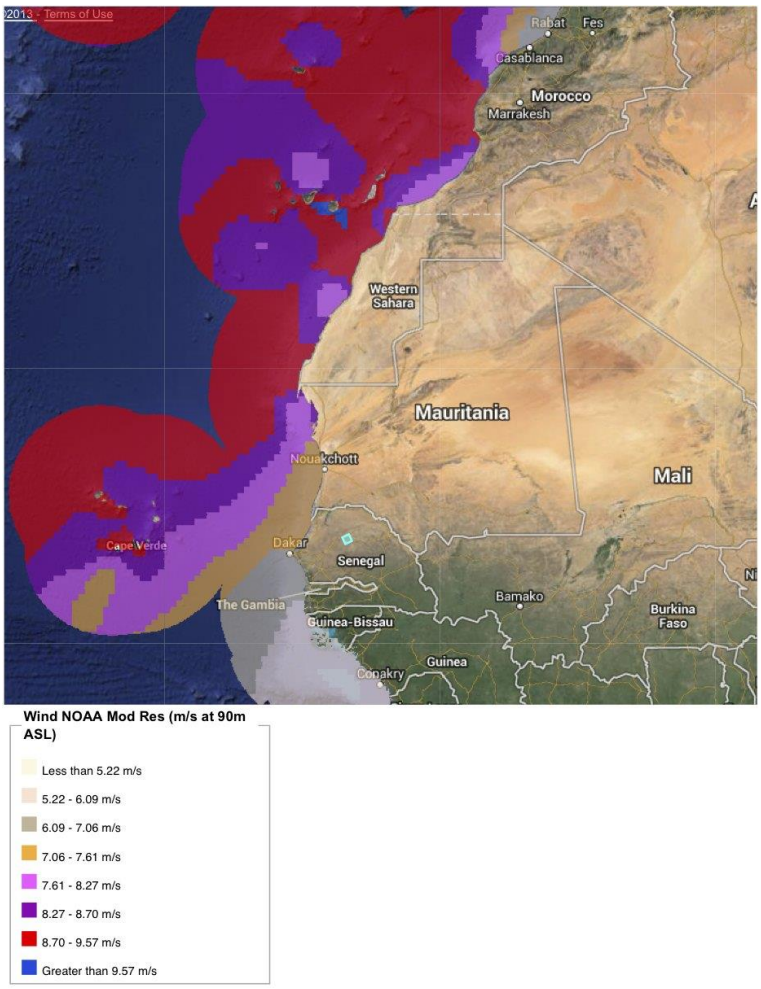
There is a particularly favorable context for the implementation of solar projects of importance to reduce the fuel consumption of network industries located outside. The first test project SNIM will help to better evaluate the savings. Similarly, mini-grids hybridization projects will reduce energy bills. Nevertheless:

- it is difficult to prove the savings / feasible because of the existing tariff system and the lack of information about the real electricity generation costs. Outside network, the measurement is easier;
- there is a need to better control the questions of hybridization / coupling with solar technologies to balance production and consumption either on or off the network;
- Project monitoring and evaluation of the impact of existing solar power plants would better understand the conditions of implementation, productivity and the need to extend this type of application in the country.

Wind

Mauritania has a significant potential of wind resources. The most promising resources, as seen in the graph below, are concentrated in the western area of the country. These data are mainly interpreted from satellite measurements that are available online and, in order to accurately provide the data, must be confirmed by specific measurement campaigns in the country.

Figure 9 Wind Map of Mauritania



Source: *SWERA NOAA*[24]

The map indicates a wind speed between 8.3 and 8.7 m / s on the coastal areas in the northwest, such as Nouadhibou, and small portions of territory up north in the coast line with wind speeds even higher (9 m / s). The values fall gradually moving down south of the country but remain above 7 m / s along the coast. These values are quite high in absolute terms and represent an interesting potential in coastal areas. Wind regimes, however, are affected by topography and site's specific conditions, making assessments on the subject more difficult.

[24] http://en.openei.org/apps/SWERA/?active=Mauritania

Background, early usage and barriers

The use of wind energy is explored since the late 1980s in Mauritania. The main technologies used covered the use of the mechanical energy of the wind to the pumping and electricity generation on and off network

A major demonstration and testing program was also conducted in Mauritania in collaboration with the Institute of Technology of the Canaries (ITC) between the late 1990s and early 2000. This has included the development of a wind atlas of the country, a demonstration platform for renewable energy and maintenance at the University of Nouakchott and commissioning of 4 water desalination units (20-40 m3 / day) in the National Park Banc d'Arguin. There was a small capitalization of the test program and wind demonstration in Mauritania. However, the partnership fostered the country's interest towards the technology, resulting in the installation of several projects and off-grid.

In terms of wind power plants, a farm of 4.4 MW is in operation since 2012 in Nouadhibou serving the needs of SNIM. It consists of 16 Vergnet turbines mounted on retractable masts. In addition, a new 30 MW is being finalized in Nouakchott and will be integrated to SOMELEC's network. It should be noticed that the result of the call for tenders for wind farms in Nouakchott surprised the national players for the price per kWh content despite low wind speeds at the North.

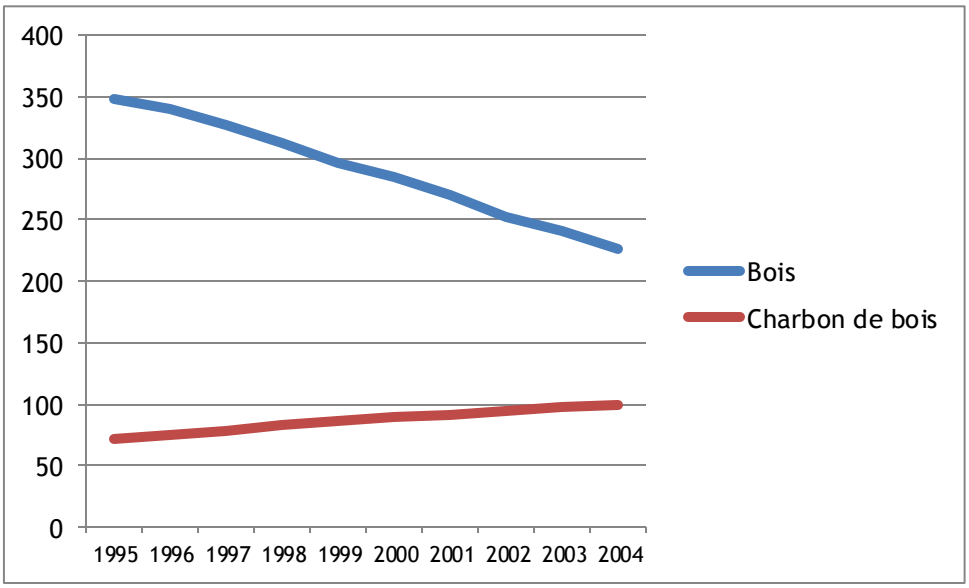
The size of the Mauritanian market does not justify the construction of local manufacturing units, but a number of elements can be produced on site. The main technical barriers to integration of wind power in Mauritania include:

- *The lack of companies with experience in the field*, mainly for pumping since Deyloul closed;
- *difficult network integration*: today, the only plant in operation, Nouadhibou, injects a small portion of potential output in the network SNIM. The output is only used in advanced production units with fuel. It should be noticed that most units are not intended to manage the production of fuel around wind capacity;
- *lack of lift capacity*: there is no crane Mauritania able to install the mats and modern wind turbines that can reach more than 100m high and several dozen tons.
- *No comprehensive measurement campaign was conducted in the country known to the consultant*. By cons, a number of measurements were made from specific measurement masts whether the intention to carry out a project pre-feasibility study or as part of scientific research in the past. The most accurate data obtained from measurement masts for feasibility studies have been collected for relatively short periods of one month. Cells, from scientific facilities, seem to date difficult to use when they are still available and in any case must be validated by further studies. It would be useful to exploit the long data measuring stations installed and to find the data related to the Wind Energy Atlas prepared in 2000.

Biomass

The primary energy consumption of Mauritania (67%) is provided by traditional biomass (wood and charcoal). Despite its desert climate, a significant part of the energy consumption of the country is currently provided by biomass.

Figure 10 Consumption of wood-fire and charcoal (thousand tons



Source: Direction de l'environnement, 2008

The graph above shows a decrease in the consumption of wood and an increase in charcoal consumption. These two resources are a prime source for cooking. But traditional biomass consumption combined with the effects of drought and fires, degraded dramatically the vegetation cover of the country. These resources are threatened by a combination of factors and are now the subject of substantial re-vegetation programs whose results have yet to be evaluated.

On the other hand, agricultural residues previously provided a little over 500 000 t of waste per year, corresponding to an energy potential of about 3.7 GWh. But the events between 1991 and 2001 have led to a sharp decline in agricultural production. These activities have since resumed, but the potential resource must be re-evaluated.

Two additional potential resources can be noted. One, Jatropha, is mentioned as a possible help in the fight against desertification and has potential to produce biofuels. A perennial plant which consumes little water, Jatropha could actually serve well the Mauritanian re-vegetation program. For cons, the plant requires a sufficient amount of water to be productive in seeds (based biofuel production), which might limit its productivity. The other plant, Typha, would have a more limited use, replacing charcoal in the cooking and also its usage would serve to reduce its presence in rivers and rivers, improving the conditions of the local biome.

3. FUTURE DEVELOPMENT AND INVESTMENT NEEDS IN EACH OF THE ENERGY SUB-SECTORS

3.1. OIL UPSTREAM

Sectorial policy in Hydrocarbons aims to ensure the proper management of the oil industry so that it contributes to achieving the overall objectives of the country's sustainable development. This policy is based on the following:

- The implementation of the new legal framework that aims to modernize the conditions for granting oil licenses, optimizing the part of the state and the promotion of the National Company (10% now to SMH during exploration, with financial porting by the operator), while maintaining an acceptable level of commitment of oil companies. Nine (09) Exploration and Production Contracts have so far been signed and approved on the basis of the Code;
- The establishment of a database to facilitate the promotion of complimentary blocks;
- Optimizing the benefits of oil revenues by maximizing the positive effects and mitigating the negative impacts to environmental and social;
- Protection of the Environment: a significant effort was made during the review of the legal and regulatory framework to take into account relevant international standards in the oil industry in order to ensure better protection of our fisheries resources and the environment in general. This measure will be coupled with the establishment of an environmental information system. In 2011, a socio-strategic environmental study was completed. Also in 2012, a Environmental Commission under the Contract governing the Chinguetti field was set up.
- The adoption of the transparency rules in the management of oil revenues to reduce poverty.[25]

3.2. DOWNSTREAM

The downstream subsector of hydrocarbons is composed of segments of import, refining, recovery in refining, transportation, storage and marketing of petroleum products. The sub-sector is characterized by a on-going process of total withdrawal of the state from direct exercise in the various segments to the private sector and the parastatal. At the same time, this withdrawal will be accompanied by a strengthening of the regal authority of the State to the establishment and implementation of a regulatory framework to ensure the preservation of the country's public interest, security of supply, public safety and protection of the environment. Therefore:

- In terms of supply of liquid petroleum products, the strategy will be based on the development and optimization of storage infrastructure to ensure security of supply and the development of regulatory and contractual provisions with all the actors to create the conditions for having the pump prices as down as possible.
- In terms of supply of gaseous hydrocarbons sector policy aims securing butane gas supplies and access to the product of the neediest populations and thus reduces the pressure on the vegetable cover.

[25] Sectorial Note on Hydrocarbons, MPEM 2014

Perspectives and investment projects:

As part of the restructuring and subsector alterations, profound changes are expected in the short to medium term, for instance:

- The development of liquid petroleum storage infrastructure: Rehabilitation of filing of Nouadhibou, Nouakchott extension of the deposit;
- The rehabilitation and expansion of the storage capacity of butane gas deposits;
- Equipping of the new oil dock in Nouakchott, for the accommodation of medium-sized tankers (TM 35000);
- Implementation of the legislation deriving from the Order 05-2002;
- Capacity building of SOMIR for its role of inspection and control;
- Strengthening compliance, through regulations and the fight against illegal practices in the sector (in the medium term);
- Construction of new oil deposits in other areas of the country, construction of new drilling centers in the cities of the interior;
- Development of the regulatory framework: establishment of a new legal framework and implementing regulations in the downstream oil and gas sector[26];

3.3. Gas

The Banda Gas-to-Power Project Financing Plan

Banda Gas Project.

The estimated investment cost is US$650 million. The Banda Gas JV partners have indicated that they will raise the necessary financing through equity contributions and that no commercial project debt will be raised. The Bank has been informed that it is Tullow (as the major JV partner) intends to seek additional equity investors in the Banda Gas Project. Tullow is well advanced with their plans to secure at least one major investor prior to their investment decision and ultimately will target an equity level of 30% in the Banda Gas Project JV, and intends to remain as operator.

Development of the Banda natural gas project.

Total downstream costs of the project is estimated at US$467.1 million, including US$221.2 million for the 180 MW dual fuel plant, US$217.3 million for the 120 MW CCGT plant. The dual fuel plant is being financed by the IsDB and the Arab Fund for Economic and Social Development (AFESD).

Transmission Infrastructure

This includes three sub-components: (i) North HV line (US$170 million); (ii) OMVS line extension (US$7 million9) which connects the SPEG power plant to the OMVS substation south of Nouakchott; and (iii) South HV line (US$170 million).

[26] MPEM 2014 Sectorial note on Hydrocarbons

SOMELEC has obtained US$100 million financing for the North HV line from the Saudi Fund and has received assurance from the Saudi Fund that they are prepared to bridge the funding gap estimated at US$70 million once procurement is complete. AFD and IsDB are appraising the financing of the South HV line: IsDB for the Senegal portion only and both institutions for the Mauritania portion. IsDB has approved financing for the Senegal portion of South HV line on March 23, 2014, whereas AFD will submit its project for Board approval by the end of May, 2014[27].

3.4. Electricity Power

SOMELEC currently has five power projects at an advanced stage:

i) Dual central Nouakchott: the first phase develops 120 MW of installed capacity. Wärtsilä, a Finnish company, signed, in 2012, a turnkey contract to construct, supply and engineer a major power plant to be built in. The second phase of this project was finalised in late 2015 adding a production capacity of 60 MW.

ii) The photovoltaic panels facility Nouakchott has a capacity of 15 MW. It started production in 2013.

iii) The wind field south of Nouakchott produces 30 MW and started production mid of 2015

iv) Central Nouadhibou consists of two diesel groups of 11 MW. The project was funded by AFESD in 2006 and started production in late 2012.

v) A wind farm of a capacity of 100 MW is also planned in the region of Nouadhibou (Boulanouar) for end of 2018.

Investment

The works selected in the Master Plan for Production and Transport were essentially:

- The means of production defined in the study of supply;
- The transportation and distribution (lines HTB, HTA and associated items).

The costs of production resources employed as central Duale are from the tender recently held for the book and negotiations that take place with the provisional successful bidder.

The costs of combined cycles (2 + 1 gas turbine steam turbine combined) are drawn from the study feasibility of a system of generation and transmission of electricity from gas produced by Tractebel in 2012 on behalf of the Ministry of Petroleum, Energy and Mines.

The costs of the 225 kV lines and associated positions are drawn primarily from the Proposed Draft Detailed which follows the feasibility study mentioned above. For books and items associated 90 kV and the HTA works (33 kV lines, 33/15 posts kV voltage networks, etc.), the estimate is based on the experience of similar projects and the results in a recent tender made in several African countries, including Mauritania (Works line 90 kV Bakel - Sélibaby and associates positions) and Burkina Faso. The unit costs indicated below are based on the

[27] THE BANDA GAS TO POWER PROJECT Document of
The World Bank Group Report No: 83025 - MR

economic conditions of 2012. They are set out all customs duties and taxes applicable in Mauritania. They are given by Euros.

Transport and distribution

The priority program SOMELEC on connecting to other localities in RI is Presented below:

- Nouadhibou in 2015 by the construction of a 225 kV double circuit after the position of the future Dual plant.
- Selibabi in 2014 to the position of Bakel in Senegal by a 90 kV line and the extension of this line until Kiffa (190 km). The consultant believes that Kiffa could be connected in 2017.
- Guerrou in 2017 by a 33 kV line between Kiffa and Guerrou.
- Aleg in 2018 through a 90 kV line after the post Boghé.
- Boutilimit in 2019 by a 33 kV line between Aleg and Boutilimit.
- Magtalahjar in 2019 by a 33 kV line between Aleg and Magtalahjar.
- Tintane in 2018 by a 90 kV line after the post Kiffa[28].

The following table gives the total investments in production and transmission facilities electricity over the period 2013-2030:

Table 15 Financing of transport network investment costs between 2013 and 2030

Lines	Amount	SOMELEC	STATE	INVESTORS	Terms of Funds Donors		
	Million of EURO	% OF INVESTMENT AMOUNT			Grace (years)	Invest. (years)	Interest
225 kV OMVS - Dual	11,3	5%	15%	80%	2	10	3%
90 kV Sélibabi-Kiffa	22,0	5%	15%	80%	2	10	3%
90 kV Boghé-Aleg	9,2	5%	15%	80%	2	10	3%
Lines 33 kV	29,5	10%	15%	75%	2	10	4%

[28] Mauritanie: Plan directeur de production et transport de l'énergie électrique en Mauritanie entre 2011 et 2030 - Rapport provisoire

225 kV NKTT - NDB	106,4	2%	10%	88%	4	12	3%
90 kV NKTT - NDB	9,1	5%	15%	80%	3	12	3%

Source: Office of National de Statisque(ONS)[29]

Table 16 Financing of distribution network investment costs between 2013 and 2030

Lines	**Amount**	**SOM ELEC**	**STATE**	**INVESTORS**	**Terms of Funds Donors**		
	Million of EURO	**% OF INVESTMENT AMOUNT**			**Grace (years)**	**Invest. (years)**	**interest**
Non electrified cities	5,8	20%	80%	0%			
Already electrified cities	2,9	80%	20%	0%			
NKTT – Distribution grid	112,3	10%	15%	75%	2	8	3%
NKTT - MV grid (posts)	57,7	25%	10%	65%	2	8	3%
NDB – distribution grid	5,4	30%	70%	0%			

Source: Office of National de Statisque (ONS)[30]

[29] Office National de Statistique. www.ons.mr
[30] Office National de Statistique. www.ons.mr

85% of investments are funded by donors and 15% by the state. The contribution of SOMELEC is 0.2%. The investments include only investments in external financing. Without external funding for investments concerning particular distribution.

Financing Investment Costs:

Except for the dual core, investment financing is not yet assured. Financial analysis is therefore bound to be based on assumptions. The financing of investments specified in the Activity Report 2010 shows three sources:

- SOMELEC
- State
- Donors

The amount financed by the state in the model is the contribution of a company partner. Therefore, the state does not seek reimbursement of the amount financed or interest. The terms of the loans provided by donors are shown in the following tables. It is assumed that donors do not ask for interest during construction.

Disbursement and repayment are made in two instalments per year. The length of the repayment period begins at the end of the grace period.

Table 17 Financing of investment costs for power plants between 2013 and 2030

Plants	Amount	SOMELEC	STATE	INVESTORS	Terms of Funds Donors		
	Million of EURO	% OF INVESTMENT AMOUNT			Grace (years)	Invest. (years)	interest
Rehabilitation of Arafat Plant,	7.0	20%	33 %	47%	2	4	4 %
Dual Plant	140,0	-	2%	BID 61% FADES 37%	47	10,5 18,5	2,5 % 2,5 %
Extension Dual Plant	70,0	5%	10 %	85%	3	8	3 %

Combed Cycle Plant. 1	140,5	5%	15 %	80%	3	8	3 %
Combed Cycle Plant. 2	140,5	15%	10 %	75%	3	8	4 %
Wind plant	45,0	5%	15 %	80%	3	10	3 %
PV Plant	42,0	5%	15 %	80%	3	10	3 %

Source: Office National de Statistique (ONS)[31]

3.5. Renewable Energy Sources:

Objectives "Energy for All Initiative 2030"	**Present situation (2013/14)**	**Final result (2030)**	
1. Energy mix **&** Promotion of Renewables	***significant***		
• *Hydro power (share in OMVS)*	*48 MW*	*217 MW*	
• *Solar & Wind*	*60MWc*	*470MW*	
• Biofuels and biogas		*50KWc*	
Sub total of direct investments			**$3, 822, 375 million**

Wind and solar

i. Park of photovoltaic panels in the region of Nouakchott with a capacity of 15 MW, constructed by United Arab Emirates (UAE) company Masdar. The solar photovoltaic (PV) plant was delivered in 2013 and cost almost US$32 million to build.

ii. Wind farms in Nouakchott developed since 2013 by Spanish company Gamesa (30MW) and Vergnet (4.4MW).

Biomass

Potential projects

Typha could be used instead of charcoal to partially reduce pressure on forest resources. A carbonization program typha is being tested in the Rosso area and could be extended to cover some of the needs. At the initiative of the APAUS, implemented by GRET in collaboration with ISET and PND, the project co-funded by the EU within the framework of the FE / EU /

[31] Office National de Statistique. www.ons.mr

ACP aims to produce a replacement charcoal wood charcoal Typha. The first production units have been set up and should gradually be extended in the area.

Figure 11 – *Rosso Typha* Coal

[32]

Preliminary results demonstrate the value of this program in terms of restoring biodiversity, with indication of re-appearance of the water lily and fishing in Typha cutting areas.

Moreover, the implement a gasification project / incineration of waste in the city of Nouakchott. This could justify a capacity of 15-20 MW of electricity. The feasibility study of the project, considered as independent production (IPP -Independent Producer- Power) is underway.

There is also a project for sugar production in Fooum Gleita, which is currently under evaluation. It basically generates power up to 18 MW and 10 million gallons of ethanol per year through the use of4 bagasse.

Industry / companies / suppliers:

Regarding biomass, the main technologies produced in the country cover the improved stoves. About 56% of the population is using solid fuels (wood and charcoal) for cooking (30% of the urban population and 82% of the rural population). Out in the moment, only 0.4% of the population would use improved stoves (details to be confirmed). The scope for growth is important.

The main improved stoves available homes listed include:

[32] RRA Renewable Readiness Assessment - Stratégie Nationale de Développement des Energies Renouvelables

- Ouaga Vita type Metallic, consuming wood and bringing potential savings of 45%. These would cost approximately 3-6 € / unit;
- Multi 4-7-30 (home "maslaha), metal, wood consumption and to make potential savings of 30-35%, introduced in the 1990s.

The early dissemination and training programs, supported by ESMAP, targeted the areas of Nouakchott in 1990. They included a significant training of potential producers of improved stoves (190 artisans blacksmiths and carpenters metal). More recently, the ProCEAO program, funded by GIZ and European Cooperation in implemented an improved stove dissemination project (such Vita) in Guidimaka region with homes dissemination objective with approximately 5000 households in 2014.

The options identified in the field of biomass use are numerous, ranging from the production of energy from waste, distribution and manufacturing of improved stoves through the potential implementation of biodigesters. These are applicable in the context of centralized generation and distributed energy generation. There remains a need:

- updating estimates of potential resource in terms of agriculture waste capacity of synthetic production and use of improved stoves.
- capitalization of past experiences and success;
- updated summary of available technologies and assessment of local producers in business.

4. MONOPOLIES AND PRIVATISATION ACCORDING TO EACH ENERGY SUB-SECTOR Monopolies (legal, de facto, natural)

Mauritania has an institutional framework suitable for investments in accordance with international commitments, The country has undertaken significant reforms focused on the its legal framework for business, modernization of the institutional framework and the adoption of economic measures enshrining freedom of undertake and guarantees to investors, while simplifying formalities and procedure required for investment in Mauritania.

The reform of the legal framework for business has been characterized by the overall modernization and the current revision of many legal texts that govern business activity, for instance: Investment Code, the Commercial Code, Nouadhibou Free Zone, Tax Code, Customs Code, Labor Code, Public Procurement Code, among others.

The reform of the legal framework was accompanied by a modernization of the institutional framework of the investment with the establishment of the Directorate General of Private Sector Promotion DGPSP including Directorate for Single Window and Private Investment Monitoring (DGUSIP), serving for the institutional implementation of the provisions of the Investment Code. This structure was designed to facilitate and simplify the legal procedures of incorporation of companies and to provide rapid response to various requests of investors. The DGPSP plays a central role in the definition, implementation and monitoring of private sector development strategies.

At the international level, Mauritania has signed agreements for the development and promotion of investments (APPI), as well as double taxation agreements (CNDI)[33].

The petroleum sector is open for investors through a Petroleum Code and an EPC Exploration Production Contract (Article 12).

For: the purpose of Article 18 of the Code of crude oil, the entire national oil industry is seen as an area open to competition within which the blocks can not in principle be subject to an ' 'exploration-production' contract without following a competitive tender.

Notwithstanding this principle, a decree of the Council of Ministers may define one or more areas within which the blocks may be the subject of direct negotiations without competitive bidding, a reasoned proposal of the Minister of showing interest recourse to such a procedure in relation to the areas in question (Article 18, *in fine*).

4.1. Investments opportunities in the privatization process

Faced with profound economic imbalances, the Mauritanian government has undertaken, from 1985, a structural adjustment program, implemented through the economic and financial recovery program (PREF 1986-1988), followed by consolidation and recovery program (89-91). The objectives of these policies involve mainly divestment of the public sector,

[33] Guide de l'investissement 2014 ;p 10

liquidation of non-strategic public enterprises and privatization of profitable state-owned companies[34].

4.2. Restructuring and privatization plans

In order to lay the foundations of a liberal economy, the Government of Mauritania has prioritized the development of the private sector through the implementation of various economic programs.

These programs have had significant results in terms of recovery and consolidation of macroeconomic equilibrium. The country is currently in a recovery phase of economic growth, it is now for the authorities to ensure that this growth is consolidated and that its benefits are equitably distributed, especially in the direction of the layers that need it most. In this context, the government decided for the abolition of monopolies, trade liberalization and the withdrawal of the State from productive sectors.

At the sectoral level, the main reforms focused on liberalizing almost all sectors: fishing, agriculture, agro-industry, insurance, banking, air transport, the opening of the mining sector to private operators. SOMELEC, responsible for the distribution and production of electricity, and SNDE, responsible for the distribution of water, were restructured.

The Government of Mauritania, partnered with international players, including the European Union and the World Bank, has also implemented several institutional reforms. These measures include strengthening private-public dialogue, the adoption of a new Code of Public Contracts, creating a Directorate General specifically responsible for the promotion of the private sector, the enactment of a new Investment Code (*see section 6.1*) and the creation of a free zone in Nouadhibou.[35]

Continuity and acceleration of reforms are now strong political objectives for Mauritania, so it can continue to improve its business climate, reduction of unemployment, corruption levels, reduce the weight of the informal sector and support economic growth .

[34] GUIDE DE L'INVESTISSEMENT 2014 ;P 13

[35] GUIDE DE L'INVESTISSEMENT 2014;P 43

5. GENERAL LEGISLATION RELEVANT TO INVESTMENTS

5.1. Foreign investment legislation, including definitions and forms of investments

In 31 July 2012 the new Mauritanian Investment Code was promulgated[36]. The Code provides for equal treatment for both domestic and foreign investors, protection for investments, facilitation of administrative procedures relating to business, with the ultimate goal of promoting investment and the increasing the diversification and competiveness of the Mauritanian economy.

Foreign investors can benefit from the Establishment Convention Regime in the field of Renewables (solar and wind). According to Article 24 on Establishing Conditions and Benefits: Established conditions as well as granted specific benefits are determined in the framework of the agreement negotiated with the relevant departments in conjunction with the Ministry of Economic Affairs and Development and the Ministry of Finance. Established conditions are granted for a period of twenty (20) years. Enterprises may be exempted from following taxes:

- *Value Added Tax (VAT);*
- *Tax on Salaries and Wages (TSW)*
- *Tax on Industrial and Commercial Income (TICI)*
- *Municipal taxes are limited to a license.*

However, investments outside Nouakchott enjoy exemption on Industrial and Commercial Income as specified in Article 22 of the present Code. The implementation of the agreement requires an approval through a Cabinet Order*)*[37].

The Investment Code (Article 32) provides for the structuring of a Coordination Body concerning general investment policy at Ministerial level including the participation of relevant departments, the Chamber of Commerce, Industry and Agriculture in Mauritania, enterprises, civil society, trade unions and representatives of technical and financial partners. The latter serving as observers. This Committee aims to:

ensure consistency of government policy on the promotion and protection of investments in the context of a global strategy for economic development;

incite dialogue in term of partnership between private and public sectors;

periodically assess activities for the promotion of investments and the effect of benefits granted under the present Code;

prepare an annual report on investments in Mauritania and their economic and social impact.

[36] Law 052 of 31 July 2012
[37] Article 27 of the Investment Code 2013

Transparency, protection of property and non-discrimination

Transparency, protection of property and non-discrimination are investment policy principles underlying the efforts of Mauritania to create a favorable investment climate. The protection of persons and property is recognized and guaranteed by constitutional provisions (Articles 13, 15 and 21 of the Constitution).

The right to property is a general prerogative that applies to different properties in Mauritania. All investments in Mauritania are protected by the Constitution, which provides in Article 15 that "the right of property is guaranteed" and expropriation cannot be carried without a public interest command and after a fair and prior compensation.

In this regard, bilateral agreements for the promotion and protection of investments signed by Mauritania meet international standards (*see section 6.7*). They state that expropriations may be carried in the public interest, in a non-discriminatory way and have to be followed by the payment of prompt, adequate and effective compensation. Also, the acquisition of private property by foreign nationals is allowed by the legal framework. Consequently, any natural or legal person may, without distinction of nationality freely acquire or dispose of movable or immovable property.

Building permits

The Urbanism Code regulates the conditions of issuance of building permits. This permit is required for all new construction and any changes to existing buildings. It is supplemented by Decree No. 2007/205 approving the General Regulations of the building which is intended to govern the construction field by establishing a legal framework for improving the general environment of the building and ensuring an acceptable threshold quality and safety for the works. This decree applies to all construction work and subject to building permits or work permits. In principle, the construction of industrial units should only be made in industrial and commercial areas. The building permit is required for all persons for both buildings for residential use than for commercial or industrial use. Municipal services and urban planning must give their opinion before construction.

Establishment of enterprises

Investment Code of 2012, regulates the forms of organization and registration for economic activities. There are no differences between establishment of national and foreign companies.

Entrepreneurship and corporate law

Mauritanian law companies are governed by Law No. 2000-05 January 18, 2000, the Commercial Code. Any individual is free to create a society. The main forms of commercial companies are:

- Société anonyme (SA): The SA is composed only of shareholders. Its share capital must be at least 20 million UM if the company is publicly offering and 5,000,000 UM at least otherwise. The SA must be made between at least five shareholders. The Director General, who may be the chairman of the board of directors, is appointed by the Board of Directors. The partners are liable for the company debts only up their contributions.

- Limited Liability Company (LLC): Formed by one or more members, the LLC is the most common and simplest form of society. The capital of the limited liability company is freely determined by the partners in the articles. It is divided into shares of equal nominal value.
- Partnership (CNS): The partnership is one in which all partners have merchant status and management of the company is ensured by themselves or by one or more paid managers. The share capital is divided into shares of the same face value. The partners are traders and have unlimited liability for the company debts.
- Partnership: Mauritanian law establishes the limited partnership and limited by shares.
- The limited partnership is one in which one or more partners jointly and severally liable for the debts referred to as "general partners" with one or more partners liable for corporate debts to the extent of their contributions known as "limited partners" or " Limited partners "and whose capital is divided into shares.
- The limited by shares whose capital is divided into shares, is made between one or more general partners who have the status of merchants and unlimited liability for the debts and sponsors who have the status of shareholders and support the losses not exceeding their contributions. The number of limited partners cannot be less than three.
- The types of companies under the Commercial Code also include the joint venture, unincorporated and in which the partners are jointly and severally liable for the debts. Moreover, the economic interest group (EIG), which does not have the status of a commercial company but has a legal personality, brings together at least two members for a fixed term to put their resources to jointly the development of part of their activities. Among the companies formed in Mauritania, limited liability companies (SARL, SA) account for the vast majority of legal forms adopted.

Legislation on land/immovable property/real estate acquisition by foreigners (natural persons and legal persons)

In practice, the exercise of the right to property is real. There are no laws restricting foreign access to land ownership; foreign investors can acquire rights of any kind in property, concessions and administrative permits and participate in public procurement. The investor must apply to the Minister of Finance through the services of management areas. The property acquisition procedure is the same for nationals and foreigners. This is for the purchase, lease or sale of real property.

(*see also section 6.1 above*)

Sectoral laws

See subtitle 1.4 on Energy Industry Regulation of this Report.

Pipeline/transit regulations

Mauritania does not have gas infrastructure. The Petroleum Code, however, provides regulation to the area of gas also, as follows:

Art.59.- The exploration and production contract provides the contractor during its period of validity and the conditions defined therein, the right to build pipelines in the country allowing it to transport hydrocarbons to storage points, treatment, removal or fat consumption. The

layout and characteristics of the lines should be established to ensure the collection, transport and disposal of hydrocarbon production in the best technical, economic and environmental.

Art.60.- The works of transport and storage made by the contractor within or outside the contractual scope for the purposes of development and exploitation of deposits discovered in the scope in question are considered integral parts production facilities. The costs of the operation and maintenance and depreciation of these works are for the purposes of income tax deductible classified as current operating expenses of operating profit and said costs to the excluding depreciation, are recoverable oil costs for the production sharing)

Bilateral investment treaties

Mauritania has signed tax treaties, which establish measures of mutual assistance in order for the collection of taxes and also agreements on the promotion and reciprocal protection of investments. They aim to provide a more transparent and predictable conditions in the area of investment. To this day twenty conventions and agreements have been concluded between Mauritania and third countries, including Algeria, the countries of ECWA ka, UMA, France, Senegal, Tunisia.

Annex 1: MEMBERSHIP OF MAURITANIA IN INTERNATIONAL ORGANISATIONS

Mauritania is a member of most international institutions such as the United Nations (and its affiliates), the Arab League, the International Monetary Fund, the World Bank (and its affiliated organizations, including the International Finance Corporation and the Agency multilateral investment Guarantee [MIGA]), the International Centre for settlement of investment Disputes (ICSID), the World trade Organization (WTO), the African Development Bank, Islamic development Bank and the International Monetary Fund Arabic. Regionally, Mauritania is part of the Arab Maghreb Union (AMU), which was founded in 1989 by Mauritania, Algeria, Libya, Tunisia and Morocco; to create an economic union.

Since its independence, Mauritania has signed several bilateral agreements for the protection and promotion of investments as well as double taxation agreements "CNDI". The provisions of these agreements offer guarantee and security to foreign investors and fall within the sense of alignment on liberal standards recognized internationally.

Member of: ABEDA, ACCT, ACP, AfDB, FADES, AL, AMF, UMA, CUEA, CCC, CEAO, CEA, ECOWAS, FAO, G-77, GATT, BIRD, ICAO, AID, IDB, IFAD, FCI, OIT, FMI, OMI, INTELSAT, INTERPOL, CIO, UIT, LORCS, NAM, OUA, OCI, ONU, CNUCED, UNESCO, ONUDI, UPU, OMS, OMPI, OMM, OMT

Source: Ministry of Foreign Affairs

1.	Convention on the Protection of the Ozone Layer
2.	Protocol on Substances that Deplete the Ozone Layer
3.	Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer
4.	United Nations Framework Convention on Climate Change
5.	Kyoto Protocol to the United Nations Framework Convention on Climate Change
6.	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
7.	Stockholm Convention on Persistent Organic Pollutants (POPs)
8.	Rotterdam Convention on the Prior Informed Consent Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC)
9.	International Convention on Plant Protection
10.	Phytosanitary Convention for Africa
11.	African Convention on the Conservation of Nature and Natural Resources
12.	Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR)
13.	Convention on International Trade in Endangered Species of Wild Flora and Flora (CITES)
14.	Convention on the Conservation of Migratory Species of Wild Animals
15.	Convention on Biological Diversity

16.	Cartagena Protocol on Biosafety of prevention to the Convention on Biological Diversity
17.	United Nations Convention on the fight against desertification
18.	Agreement on the Conservation of African-Eurasian Migratory Water birds
19.	International Treaty on Plant Genetic Resources for Food and Agriculture

Annex 2: LIST OF BITS AND DTAS - List of Bilateral Investment Agreements, as of 30 June 2015

Partner	Status	Date of signature	Date of entry into force
Algeria	Signed (not in force)	06/01/2008	
BLEU (Belgium-Luxembourg Economic Union)	Signed (not in force)	23/11/1983	
Burkina Faso	Signed (not in force)	18/05/2001	
Cameroon	Signed (not in force)	18/05/2001	
Gambia	Signed (not in force)	09/05/2001	
Germany	In force	08/12/1982	26/04/1986
Ghana	Signed (not in force)	18/05/2001	
Guinea	Signed (not in force)	18/05/2001	
Italy	In force	05/04/2003	09/12/2009
Korea, Republic of	In force	15/12/2004	21/07/2006
Kuwait	Signed (not in force)	01/08/2006	
Lebanon	In force	15/06/2004	30/04/2006
Lithuania	Signed (not in force)	22/09/2012	
Mauritius	Signed (not in force)	18/05/2001	
Morocco	In force	13/06/2000	20/10/2003
Qatar	Signed (not in force)	25/12/2003	
Romania	In force	14/03/1988	19/12/1989
Spain	Signed (not in force)	24/07/2008	
Switzerland	In force	09/09/1976	30/05/1978
Tunisia	Signed (not in force)	11/03/1986	

Source: UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Annex 3: EXCEPTION TO THE NATIONAL TREATMENT PRINCIPLE

EXCEPTION COUNTRY: Mauritania

MEASURES

Investment Code 2012 - Act No. 2012 – 052 Relating to Investment Code, Article 11

SECTOR

National Economy

LEVEL OF GOVERNMENT

National

DESCRIPTION

Employment of expatriate staff (Article 11)

1. Companies may employ expatriate staff in key positions up to 10% of managerial staff accordance with the labour legislation in force in Mauritania.
2. The recruitment of expatriate staff is subject to obtaining authorizations and work permits issued by the relevant authorities for the positions to provide or equivalent if they are not available.

PHASE-OUT

No plans for changes.

OTHER EXCEPTIONS

None

Energy Charter Secretariat

2017

Energy Charter Secretariat
Boulevard de la Woluwe, 46
B-1200 Brussels, Belgium

Mail: info@encharter.org
Web: www.energycharter.org
Phone: +32 2 775 98 00
Fax: +32 2 775 98 01