

COUNTRY CHAPTER: GUINEA-BISSAU

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ACRONYMS AND ABBREVIATIONS

GUINEA-BISSAU

AD	Action for Development
AUDCG	Acte Uniforme Relatif au Droit Commercial General (Uniform Act on General Commercial Law)
BCEAO	Banque Centrale des États de l'Afrique de l'Ouest (Central Bank of West African States)
CFAF	CFA Franc (1 Euro = 655,957 CFAF)
DGE	Direction Générale de l'Énergie (General Direction of Energy)
EAGB	Electricidade e Águas de Guinea-Bissau (Electricity and Water Company of Guinea-Bissau)
GDP	Gross Domestic Product
INEC	Instituto Nacional de Estatística e Censos (National Institute of Statistics and Census)
LPG	Liquefied Petroleum Gas
OHADA	Organisation Pour l'Harmonisation en Afrique du Droit des Affaires (Organization for the Harmonization of Business Law in Africa)
PRS	Poverty Reduction Strategy
PV	Photovoltaic
RE	Renewable Energy
SIE	Système d'Information Énergétique (Energy Information System)
TEC	Common External Tariff
UEMOA	Union Économique et Monétaire Ouest Africaine (West African Economic and Monetary Union)

MEASUREMENTS

°C	degree Celsius
€	Euro (1 Euro = 655.957 Francs CFA)
GWh	gigawatt hour (1 GWh = 1,000,000 Kilowatt hours (kWh))
h	hours
km ²	Square kilometer
ktoe	kilotons of oil equivalent (= 1,000 toe)
kVAh	kilovolt ampere hour
kWh	kilowatt hour
kWp	kilowatt peak
m/s	meters per second
m ²	square meter
m ³	cubic meter
mm	millimeters
MW	megawatt (1 MW = 1,000 kW)
toe	tons of oil equivalent



SUMMARY

The Country Study of Guinea-Bissau is to provide an overview of the country's energy market and to support decision-making for private investments for the Renewable Energy (RE) sector in Guinea-Bissau. The study is structured as follows:

Chapter one provides **Background Information on Guinea-Bissau**. This includes an overview of geographical and climatic conditions, as well as the most important facts in view of political, economic and socio-economic conditions of Guinea Bissau.

Chapter two summarizes facts and figures of Guinea-Bissau's **Energy Market** including stakeholders and market actors involved as well as sector related regulations.

Chapter three presents the currently existing **Political Framework for Renewable Energies** in Guinea-Bissau. This includes an overview of support mechanisms for photovoltaic (PV) as well as already existing regulations, incentives and legislative framework conditions concerning other RE technologies.

Chapter four provides a brief overview of the **Status Quo and Potential for Renewable Energies** in Guinea-Bissau.

Chapter five summarizes the existing and potential **Market Risks and Barriers** in general with focus on RE.

Chapter six presents a compilation of the most relevant **Renewable Energy Business Information and Contacts** of Guinea-Bissau.

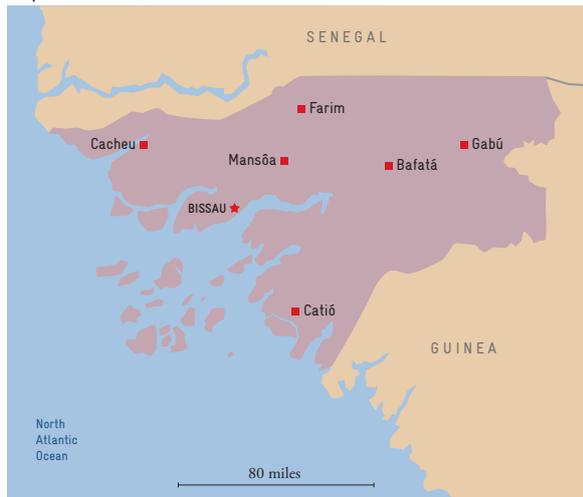


1 COUNTRY INTRODUCTION

1.1 GEOGRAPHY AND CLIMATIC CONDITIONS

Guinea-Bissau is located in West Africa and limited by the Atlantic Ocean, Senegal and the Republic of Guinea. The total area is 36,125 km² with approximately 28,000 km² constituting the continental part. Offshore, there are about sixty small islands of which the archipelago of Bissagos is the most important one.

FIGURE 1:
Map of Guinea-Bissau



With the exception of the islands, Guinea-Bissau is dominated by a marshy coastal plain. The relief rises gradually towards the East and forms a shelf culminating in 360 meters of altitude in the South East. Numerous rivers flow from West to South and form vast estuaries at their mouth. Many of them are navigable and constitute the principal means of transport. The country is subject to a hot and wet tropical climate, with annual average temperatures of around 25 °C. From one season to another, the variation of temperature is not very significant.

The rainy season lasts from June to November with wind blowing from South West; the annual average precipitation is around 1,200 mm. The dry season extends from December to May with Harmattan blowing from the North East.

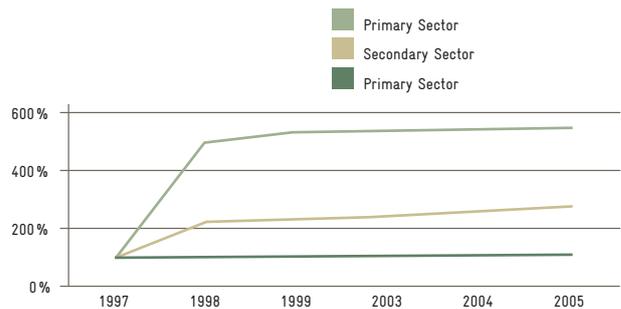
1.2 POLITICAL, ECONOMIC AND SOCIO-ECONOMIC CONDITIONS

The former Portuguese colony of Guinea-Bissau gained its independence in 1974. Since then, several political changes have occurred in the country. In order to comply with human rights, the National Assembly approved of a package of constitutional amendments in line with the guarantee of fundamental rights in February 1993. But respect for these rights by the elements in power is not always the case. In August 1991, the Guinean League of Human Rights was established.

According to the National Institute of Statistics and Census (INEC), the population of Guinea-Bissau is estimated at 1,366,412 inhabitants with a population density of 34 inhabitants per km². The country counts approximately 1,500 villages, mainly with dispersed habitat. Guinea-Bissau consists of five major ethnic groups. The Balantes represent approximately 30 % of the population, the Fula 20 %, the Mandjac 15 %, the Mandingo 13 % and the Pepels 8 %. The language mostly used in Guinea-Bissau is Portuguese Creole, however the official language is Portuguese.

The economy of Guinea-Bissau mainly depends on the primary sector. The agricultural potential of the country is enormous and accounts for almost 62 % of Gross Domestic Product (GDP). More than 90 % of the exports and the employment of 550,000 people are related to this important sector. Agriculture is dominated by the production of rice and cashews. Another important source of income is the fishing sector exporting about 500 million tons per year thus accounting for 7,500,000 Euro. Figure 2 illustrates the GDP development within the last few years.

FIGURE 2
GDP by Sector (in Mio €)



Source: National Institute of Statistics and BCEAO Guinea-Bissau, as of 2005

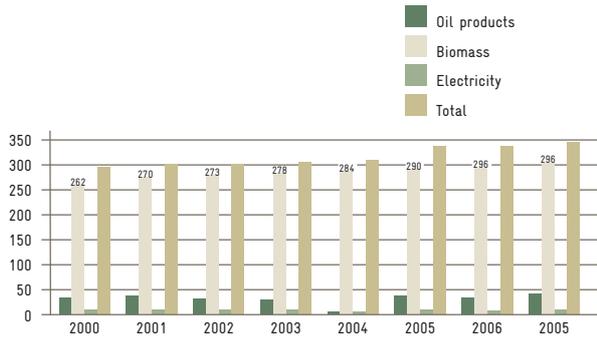
2 ENERGY MARKET IN GUINEA-BISSAU

2.1 OVERVIEW OF THE ENERGY SITUATION

The energy sector in Guinea-Bissau is divided in three parts, i.e. the electricity sub-sector, the petroleum sub-sector and the biomass sub-sector. In 2007, according to the Guinea-Bissau energy balance, the final total consumption of the country was 345,000 toe with biomass consumption as the dominant factor. Figure 3 presents the final energy consumption and the related energy sources.



FIGURE 3
Final Energy Consumption by Type of Energy (1,000 toe)



Source: SIE, Guinea-Bissau, as of 2008

2.2 ENERGY CAPACITIES, PRODUCTION, CONSUMPTION AND PRICES

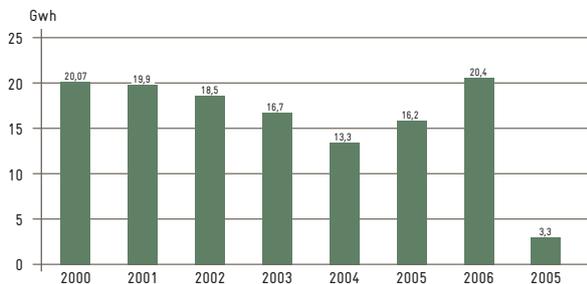
Electricity Sector

Guinea-Bissau's infrastructures of electricity production are in a bad state and the capacity is very insufficient. There is a considerable lack and malfunction of infrastructures for electricity production. The electricity production of Guinea-Bissau is thermal-based (diesel) and is based on a major thermal power plant in Bissau (with a capacity of 17.5 MW) as well as on secondary production centers (with a capacity of about 7 MW) operating in the center of the country. The peak capacity is estimated at 20 MW (figure 4). In 2006, the availability of the power station of Bissau did not exceed 3.9 MW. Today, the available capacity is 5.5 MW.

During 2002–2007, the electricity access rate decreased due to insufficient and disordered production and distribution infrastructures. Figure 5 presents the evolution of the electricity access rate.

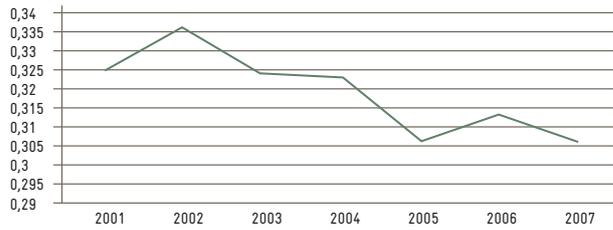
As to electricity prices, Guinea-Bissau has the most expensive tariffs in the region. Current prices are indicated in Table 1.

FIGURE 4
Electricity Production



Source: EAGB, as of 2007

FIGURE 5
Evolution of the Electricity Access Rate



Source: EAGB, as of 2007

TABLE 1
Electricity Tariffs

TARIFFS FOR HOUSEHOLDS				
Level	kWh	Price/kWh in CFAF (1 Euro = 658.957 CFAF)	Price/KVAH in CFAF	Power Tax CFAF
1	0–50	78		1,000
2	51–200	161		2,000
3	>200	322		2,100
TARIFFS FOR GOVERNMENTAL OFFICES, SHOPS, ETC.				
With meter	>0	255	48	6,400
Without meter	>0	320	48	6,400
TARIFFS FOR INDUSTRY				
Single	>0	165	50	50,000

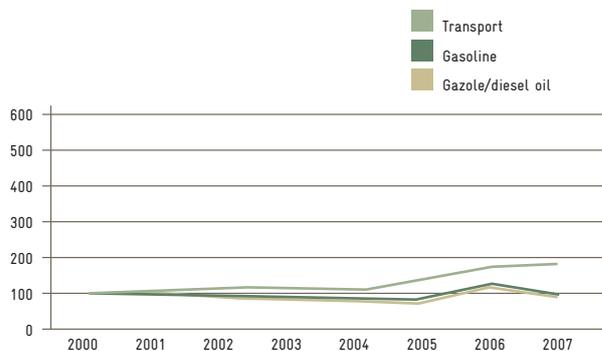
Source: EAGB, as of 2008

Petroleum Sector

Guinea-Bissau has not proven oil reserves. Therefore, all petroleum products are imported thus charging the country's economy with high expenses. According to the energy balance of 2007, the consumption of petroleum products is mainly dominated by the transport sector (40,614 ktoe), followed by electricity production (0.946 ktoe) and the residential sector (0.240 ktoe). The evolution of consumed petroleum products in the transport sector is presented in Figure 6.

Prices of petroleum products are determined by the Ministry of Energy and Industry and are to be revised on a monthly basis. Table 2 presents the prices of petroleum products.

FIGURE 6
Evolution of Petroleum Product Consumption in the Transport Sector



Source: SIE, Guinea-Bissau, as of 2008



TABLE 2
Prices of Petroleum Products (March 2008–February 2009)

As of:	PRODUCT (PRICES IN CFAF) (1 EURO = 655.957 CFAF)					
	Diesel	Diesel Electricity Generation	Gasoline	Kerosene	Gasoline	LPG
20/03/08	569	452	670	455	524	776
20/06/08	729	575	801	606	600	776
10/08/08	696	540	777	577	580	776
14/11/08	570	433	609	475	480	776
19/12/08	542	410	609	401	472	776
12/02/09	500	375	545	348	440	776

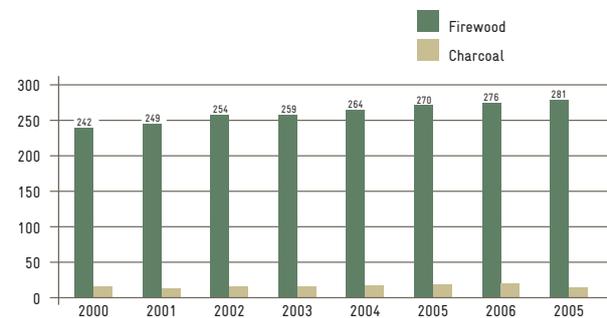
Source: Ad Hoc Committee for Oil Products Prices of the Ministry of Energy and Natural Resources, as of 2009

Biomass Sector

The biomass represents over 95 % of the total energy consumed by households in Guinea-Bissau. Wood is the dominant fuel with a demand that exceeds 500,000 tons per year, followed by charcoal being the most-used fuel in the capital. The quantity of the biomass used is around 738,000 tons.

The price of wood varies according to the demand and requested amount. Charcoal is sold by bag or measure for about 0.10 Euro.

FIGURE 7
Biomass Consumption (1,000 tons)



Source: SIE, Guinea-Bissau, as of 2008

2.3 MARKET ACTORS AND REGULATION STRUCTURES

In Guinea-Bissau, the energy sector is under the supervision of the Ministry for Trade, Energy, Industry and Environment also in charge of the definition of any policies in the overall sector and the promotion of RE.

A General Direction of Energy (DGE) is in charge of the execution of this policy. Its tasks are the elaboration of the legal and regulatory orders in the energy field and the control of their application. It is also entrusted with the realization of prospective studies, the promotion of new technologies and the follow-up of the studies of installation. Within the DGE, the service of RE is the executive body in charge of all activities related to these energy resources.

The electric system of Guinea-Bissau is managed by the Electricity and Water Company of Guinea-Bissau (Electricidade e Águas de Guinea-Bissau – EAGB). Within the existing market structure, there are several private energy producers in Guinea-Bissau. Self-sufficient producers of electricity are also

feeding part of their production into the distribution network of EAGB.

As to forest resources and domestic fuels, the overall sector is controlled by the Directorate General of the Forests supervised by the Ministry for Rural Development and Agriculture.

The development of local energy resources is controlled by the National Institute on Research and Applied Technologies under the supervision of the Ministry for Natural Resources. At the regulatory level, the Ministry of Energy delivers import and export licenses for all types of energy products and technologies.

For the overall regulation aspects, a multisector regulation unit is currently being planned. This authority will control the telecommunication sector, harbor activities and the overall transport sector. In a next step, the integration of the electricity sector in this very unit is planned.

3 POLICY FRAMEWORK FOR RENEWABLE ENERGIES

3.1 POLICIES, STRATEGIES AND PROGRAMS FOR RENEWABLE ENERGY PROMOTION

Up to now, Guinea-Bissau does not have any explicit Renewable Energies (RE) policies. Even though a draft was developed by the Government as early as 2004, the document has not been adopted yet. Furthermore, a strategic plan for RE was elaborated during 2004–2008. Due to a lack of funds, it has not been implemented yet.

At the regional level, the Common External Tariff (TEC) of the West African Economic and Monetary Union (UEMOA) was established in 2000. Within this union, there is no promising tax incentive for RE yet. Recently, UEMOA started to review the situation and is now moving towards the implementation of tax incentives that are more favorable to the development of RE. UEMOA is committed to encouraging and developing the use of RE in all member states. Therefore, it is expected that UEMOA will establish various incentives to support the sustainable development of energy supply.

3.2 REGULATIONS, INCENTIVES AND LEGISLATIVE FRAMEWORK CONDITIONS

Up to now, there are no regulations, incentives and legislative framework conditions that support the implementation of RE in Guinea-Bissau. As to rural electrification, it is planned to create ambitious regulations that allow private operators to conduct business in this sector thus offering promising opportunities for the utilization of RE.

The Governmental body in charge is the Directorate General for Energy. Up to now, however, all projects and incentives in the field of RE were realized by the investors without any involvement of the Ministry of Energy or the Directorate General for Energy. No permissions are currently required to develop RE projects. In terms of feed-in tariffs and other necessary regulations, there are no laws or regulations at all.



4 STATUS AND POTENTIAL FOR RENEWABLE ENERGIES

4.1 BIOMASS/BIOGAS

The forest areas of Guinea-Bissau are estimated at about two million hectares. The available amount of biomass is about 48.3 million m³. The annual consumption of wood for energy purposes is estimated at 625,000 m³ and leads to a significant reduction of existing forest areas. The available biomass potential from agricultural products, wood processing residues and livestock manure is about 67,000 m³ per year. In terms of bio fuel production, there is a potential of about 10,000 m³ from cashew and about 20 hectares of jatropha plantations.

4.2 SOLAR ENERGY

Guinea-Bissau has an important solar radiation: 4.5 to 5.5 kWh/m²/day over an average of 8 hours per day (3,000 h of insolation per year). In spite of this promising potential, up to now merely 450 kWp of PV installations are being used for communication networks, water pumping stations and house lighting. The Government plans to significantly increase the utilization of PV in order to cover up to 2% of the overall energy consumption by 2015. Table 3 presents an overview of existing PV installations.

TABLE 3
Existing PV Installations in Guinea-Bissau

SITE	FUNDER	UTILIZATION
Bafata and Gabu	PRS	Pumping and lighting
Bafata and Gabu	PRSII	Pumping and lighting
Bissau Bissau/Hop Raoul	PRSII	Lighting
Rural Area	PRSII	Lighting
Rural Area	PRSII	Pumping
Rural Area	PRSII	Pumping
Bissau	Guinean Telecom	Communication

Source: compiled by Julio Antonio and the author, as of 2008

4.3 WIND POWER

The average wind speed is estimated at 2.5 to 7 m/s along the coast and on some of the islands. Even though there is a very promising potential, there is no mentionable utilization of wind power in Guinea-Bissau so far.

4.4 HYDRO POWER

The available Hydro Power potential of Guinea-Bissau is estimated at about 184 MW from the rivers Corubal and Geba. Even though there is a very promising potential available, up to now there is no mentionable utilization of Hydro Power in Guinea-Bissau.

5 MARKET RISKS AND BARRIERS

The lack of consistent policies in the field of RE is the most critical of all existing market risks and barriers. Furthermore, the weakness of industrial and private sectors, together with a lack of clear direction and leadership from Governmental institutions is blocking the development of RE in Guinea-Bissau. Therefore, it is important to create a favorable environment for the private and industrial sector in order to enable them to operate effectively and encourage them to expand their investments in RE projects. The most critical technical barrier is the lack of accurate data on available RE resources.

As to necessary investments, Guinea-Bissau has no incentives or benefits in order to attract potential investors. The political instability after the civil war is still discouraging national and international investments. Other substantial risks and barriers include corruption, high costs, insufficient human resources and the absence of a coherent institutional and regulatory framework.

The foundation of a company in Guinea-Bissau is not very difficult. The OHADA Uniform Act on general commercial law (Acte Uniforme Relatif au Droit Commercial General – AUDCG) regulates the exploitation and trade of natural resources as well as intermediate operations. In the specific activities related to RE sub-sector, the exercise of commercial activities requires a license or a permit issued by the Government. This license is granted for a period of 10 years and it is automatically renewed as long as prerequisites are met. The granted period for the permit is 5 years following the same renewal conditions.

Concerning foreign investment, the Investment Code of Guinea-Bissau was created in 1991 and amended in 1996. Due to the Investment Code, individuals and legal entities from all nations around the world are invited to make investments in the country. The Investment Code of Guinea-Bissau guarantees that there are no restrictions for foreign investment and no obligation to employ local staff. Moreover, the equal treatment of companies, the freedom of commercial management and easy capital transfer procedures are guaranteed.



6 RENEWABLE ENERGY BUSINESS INFORMATION AND CONTACTS

TABLE 4

Local Business and Trade Partners

NAME	ADDRESS	FIELD OF ACTIVITY
Associação Comercial, Industrial e Agrícola a Guiné-Bissau (Commercial Association of the Industrial and Agricultural Sector)	B. P. 88, Bissau Phone: +245 22 30 84	Commercialization of the industrial and agricultural sector
Action for Development (AD)	Phone: +245 251 365 ad@solgtelecom.gw	Promotion activities for solar energy
Direcção General dos Geologia e dos Minas (General Direction for Geology and Mines)	B. P. 399, Santa Luzia Phone: +245 222 329	Regulation of the mining sector
Direction Générale de l'Énergie (DGE)	Phone: +245 664 43 47 Bissau	Energy policy
Electricidade e Águas de Guinea-Bissau (Electricity and Water Company of Guinea-Bissau – EAGB)	Rua Eduardo Mondlane Bissau Phone: +245 20 11 84	Production and distribution of electricity
Empresa Distribuidora de Combustivos e Lubrificantes	B. P. 3, Bissau Phone: +245 201 262	Distribution of fuels and lubricants
Institut National de la Recherche et Technologie Appliquée (National Institute on Research and Applied Technologies)	Rua da Guinea-Bissau Bissau Phone: +245 22 20 80	Research
Ministry of Agriculture and Rural Development	B. P. 71, Bissau Phone: +245 221 200	Domestic energy policy management
Ministry of Energy and Industry	B. P. 311, Bissau Phone: +245 21 5659 245	Regulation of the energy and industry sector
Secretaria de Estado da Energia, dos Recursos Naturais e do Ambiente (State Secretary for Energy, Natural Resources and Environment)	B. P. 399, Bissau Phone: +245 22 19 25	Energy, environment and natural resources



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