Guinea Bissau

Figure 1: Energy profile of Guinea Bissau

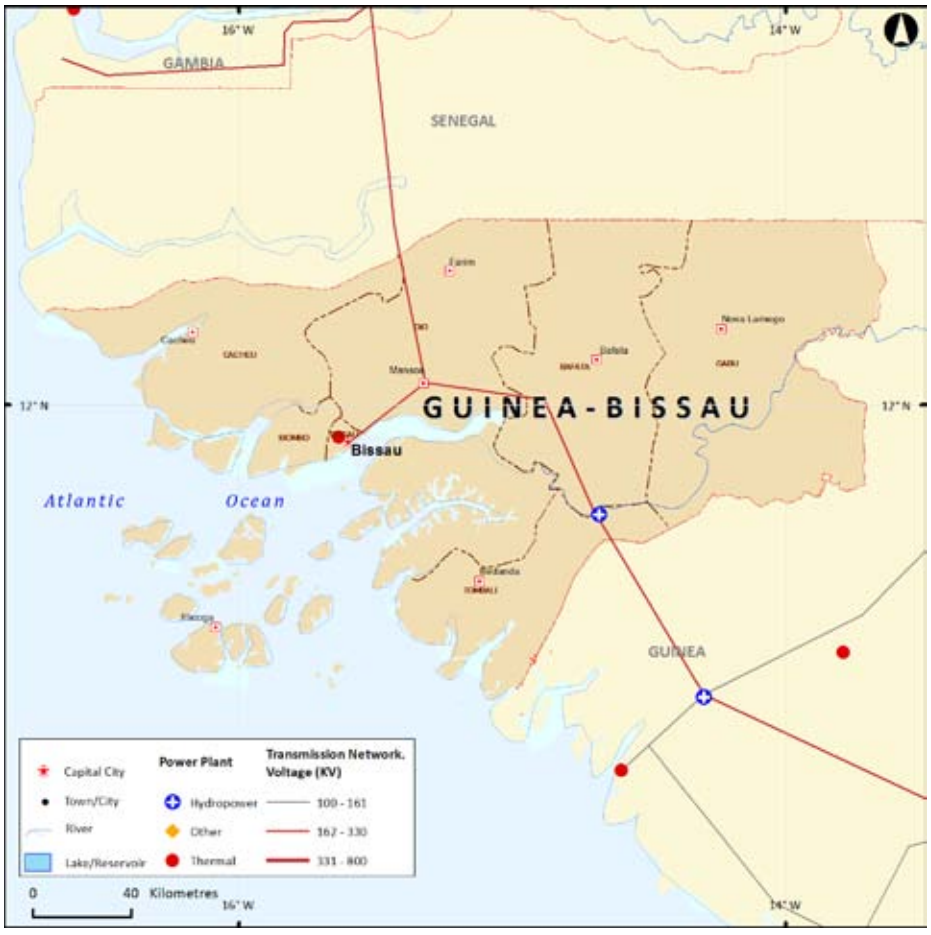
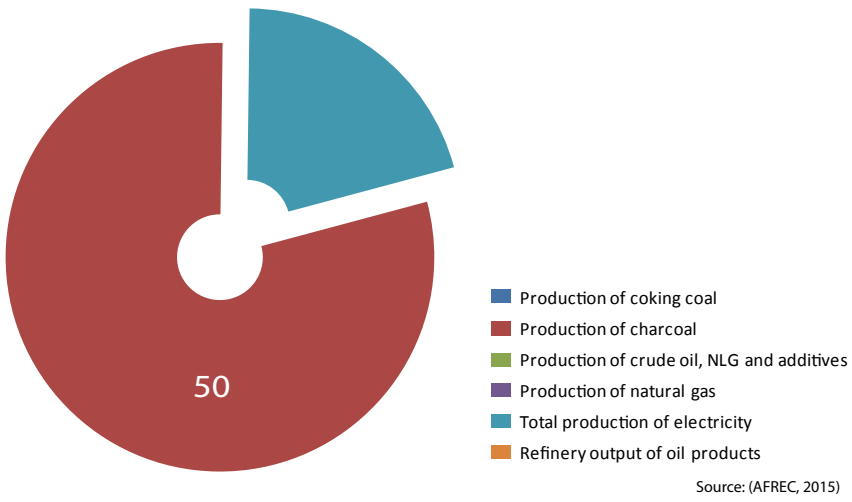
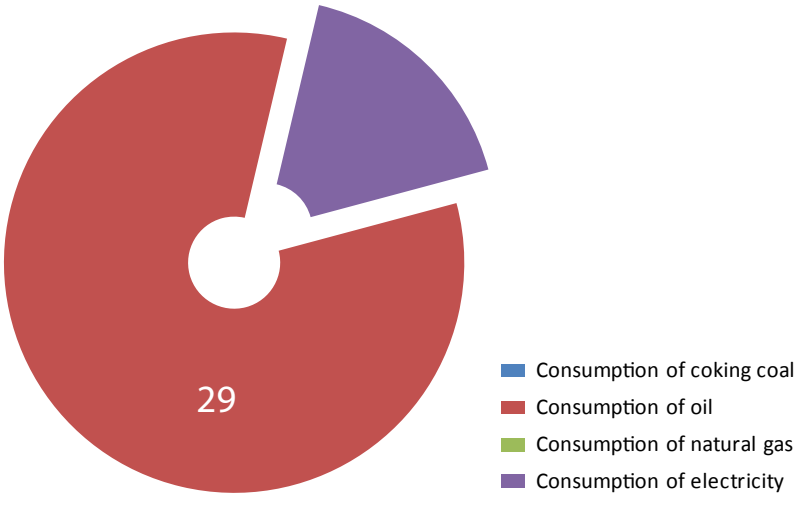


Figure 2: Total energy production, (ktoe)



Source: (AFREC, 2015)

Figure 3: Total energy consumption, (ktoe)



Source: (AFREC, 2015)

Energy Consumption and Production

Guinea Bissau has a population of 1.75 million (Table 1). Total production of electricity in 2015 was 13 ktoe with all of it produced from fossil fuels (Table 2). Final consumption of electricity in the same year was 6 ktoe (AFREC, 2015). Key consumption and production statistics are shown in Figures 2 and 3.

Table 1: Guinea Bissau's key indicators

Key indicators	Amount
Population (million)	1.75
GDP (billion 2005 USD)	0.83
CO_2 emission (Mt of CO_2)	0.24

Source: (World Bank, 2015)

Energy Resources

Biomass

Fuelwood supplies about 90 per cent of the energy consumed in Guinea-Bissau. The country has about 2 million ha of forest. The yearly consumption of wood for energy is about 1.29 per cent of the available biomass resource, which is about 48.3 million m^3 translating into a deforestation rate of 30,000 to 60,000 ha/year (AfDB, 2015) (REEEP, 2012). Charcoal production doubled from 21 ktoe in 2010 to 50 ktoe in 2015 (AFREC, 2015). There is potential for the production of biofuels from jatropha plantations and the agro-industrial waste from cashew nut cultivation (REEEP, 2012).

Hydropower

The transboundary Geba River and its main tributary the Rio Corubal are estimated to have a hydropower potential of approximately 184 MW (REEEP, 2012). But by 2015 hydroelectricity was not still not an important source of energy.

Tidal

The coast of Guinea-Bissau, with its deeply indented coastline, experiences high tidal range values making this a commercially viable energy resource. The highest mean annual tidal amplitude of 3.4 m was recorded at Porto Gole, on the banks of Rio Geba and could generate 50 MW of electricity (REEEP, 2012); (DICAT, undated). In 2015, a 500 MW tidal energy plant joint venture was announced between the government and the Israeli Wave Electricity Renewable Power Ocean (WERPO).

Table 2: Total energy statistics (ktoe)

Category	2000	2005	2010	2015 P
Production of coking coal	-	-	-	-
Production of charcoal	13	14	21	50
Production of crude oil, NLG and additives	-	-	-	-
Production of natural gas	-	-	-	-
Production of electricity from biofuels and waste	0	0	0	0
Production of electricity from fossil fuels	2	5	6	13
Production of nuclear electricity	-	-	-	-
Production of hydro electricity	-	-	-	-
Production of geothermal electricity	-	-	-	-
Production of electricity from solar, wind, Etc.	0	0	0	0
Total production of electricity	2	5	6	13
Refinery output of oil products	-	-	-	-
Final Consumption of coking coal	-	-	-	-
Final consumption of oil	33	128	133	29
Final consumption of natural gas	-	-	-	-
Final consumption of electricity	1	5	5	6
Consumption of oil in industry	0	0	0	0
Consumption of natural gas in industry	-	-	-	-
Consumption of electricity in industry	0	0	0	0
Consumption of coking coal in industry	-	-	-	-
Consumption of oil in transport	17	0	0	21
Consumption of electricity in transport	-	-	-	-
Net imports of coking coal	-	-	-	-
Net imports of crude oil, NGL, Etc.	-	-	-	-
Net imports of oil product	37	128	133	47
Net imports of natural gas	-	-	-	-
Net imports of electricity	-	-	-	-

- : Data not applicable
0 : Data not available
(P): Projected

(AFREC, 2015)

Wind

According to REEEP (2012), typical wind speeds range from 2.5 to 7 m/s along the coast and some islands. However, there are no plans to exploit this resource (REEEP, 2012).

Geothermal

There is no geothermal energy use in the country (REEEP, 2012).

Solar

Solar energy use is minimal despite the country receiving over 4.5 kWh of solar radiation and about 3,000 sunshine hours per annum (REEEP, 2012). The legal framework in support of extending renewable energies is weak, but there are plans to increase solar use by about 2 per cent of total energy consumption by 2015 (REEEP, 2012).

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Solar panels on roof, Guinea Bissau

Tracking progress towards sustainable energy for all (SE4All)

By 2012, 61 per cent of the country was electrified, but the gap between rural and urban areas is stark (Table 3). Only a small proportion of the population outside the capital has access to public electricity supply and this occurs only part of the time. Rural areas have 21.5 per cent coverage of electricity compared to 100 per cent of urban areas (World Bank, 2015); (World Bank, 2016). Despite the full access to electricity in urban areas, power is only available 70 per cent of the time (REEEP, 2012). The challenges include electricity losses due to aging equipment, illegal connections and irregular billing. The African Development Bank (AfDB) is supporting a programme to strengthen the electricity distribution network by rehabilitating some of the infrastructure, connecting new subscribers and improving the management and governance of the National Electricity and Water Corporation (EAGB). This should add 27.5 MW by 2018 while support from the West African Development Bank should add 10 MW by 2017 (AfDB, 2015).

Access to modern fuels is low. In 2012, only 2 per cent of people in rural Guinea-Bissau were using non-solid fuels; in urban areas, the proportion is slightly higher at 4 per cent (World Bank, 2015).

The energy intensity (the ratio of the quantity of energy consumption per unit of economic output) averaged 15 MJ per US dollar (2005 dollars at PPP) from 1990 to 2012. The compound annual growth rate (CAGR) between 2010 and 2012 was -0.24 (World Bank, 2015).

Table 3: Guinea Bissau's progress towards achieving SDG7 – Ensure access to affordable, reliable, sustainable and modern energy for all

Target	Indicators	Year					
		1990	2000	2010	2012	2000-2010	2011-2015
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.1 Per cent of population with access to electricity	51	54	57	60.6		
	7.1.2 Per cent of population with primary reliance on non-solid fuels	2	2	2	2		
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	70.8	50.1	37.4	88.5		
7.3 By 2030, Double the rate of improvement of energy efficiency	7.3.1 GDP per unit of energy use (constant 2011 PPP $ per kg of oil equivalent)	21.3					
	Level of primary energy intensity(MJ/$2005 PPP)	14.4		15.2	15.1	14.64	15.10

Sources: (World Bank, 2015); (World Bank, 2016)

Figure 4: SDG indicators

Percentage of population with access to electricity	Access to non-solid fuel (% of population)	GDP per unit of energy use (PPP $ per kg of oil equivalent) 2013	Renewable energy consumption (% of total final energy consumption), 2006-2011, 2012
60.6%	2.0%	**19.33**	88.63%

Table 4: Guinea Bissau's key aspects/key mitigation measures to meet its energy Intended Nationally Determined Contributions (INDCs)

INDC
*Attain 80 per cent renewable energy in the national energy mix by 2030;
*Improve energy efficiency by reducing energy losses up to 10 per cent in the 2030 time span;
*Reach 80 per cent of universal access to electricity by 2030.

Source: (ROC, 2015)

The share of renewable energy in the total final energy consumption (TFEC) has been changing drastically over the years, settling at 88.5 per cent in 2012 (World Bank, 2015). With the output gap in electricity supply, the dependence on traditional biofuels is high, forming an 80.8 per cent share of renewable sources; this threatens the national forest resource. It is estimated that 8.1 per cent of forested area was lost between 1990 and 2005 (REEEP, 2012). Modern solid biofuels contributed only a 7.7 per cent share of renewable sources in 2012 (World Bank, 2015).

Table 5: Guinea Bissau's institutional and legal framework

Basic Elements	Response
Presence of an Enabling Institutional Framework for sustainable energy development and services (Max 5 institutions) most critical ones	• Ministry of Energy and Industry • General Directorate for Energy (DGE) • State Secretariat of Energy and Natural Resources
Presence of a Functional Energy Regulator	Ministry of Energy and Industry
Ownership of sectoral resources and markets (Electricity/ power market; liquid fuels and gas market)	
Level of participation in regional energy infrastructure (Power Pools) and institutional arrangements	West African Power Pool (WAPP)
Environment for Private Sector Participation	
Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies)	National Electricity and Water Corporation (EAGB)
Where oil and gas production exists, whether upstream services and operations are privatized or state-owned, or a mixture (extent) e.g., licensed private exploration and development companies)	Ministry of Energy and Industry
Extent to which Downstream services and operations are privatized or state-owned, or a mixture (extent)	PetroGuin (national oil company)
Presence of Functional (Feed in Tariffs) FIT systems	
Presence Functional IPPs and their contribution	
Legal, Policy and Strategy Frameworks	
Current enabling policies (including: RE; EE; private sector participation; & PPPs facilitation) (list 5 max) most critical ones	• Master Plan for the Development of the Energy Sector 1980 • National Energy Policy 1995 • Draft Renewable Policy 2004
Current enabling laws/pieces of legislation (including: RE; EE; private sector participation; & PPPs facilitation) – including electricity/grid codes & oil codes (5 max or yes/ no) most critical ones	

This table was compiled with information from (REEEP, 2012) and (AfDB, 2015)

Intended Nationally Determined Contributions (INDC) within the framework of the Paris climate Agreement

Guinea Bissau is concerned about climate change because it is vulnerable to the consequences, even though its low greenhouse gas (GHG) emissions make the country a GHG sink. Hence, it articulated its INDCs in 2015 and those related to energy are shown in Table 4.

Institutional and Legal Framework

The Ministry of Energy and Industry is in charge of both implementing policies in the energy sector and regulating them (Table 5). The National Electricity and Water Corporation (EAGB) manages the electricity sector in Guinea Bissau. On a regional level, the country is a member of the West African Power Pool. The main sector policy is the National Energy Policy 1995, and more recently, the Energy Master Plan of 2013.