

Equatorial Guinea



Figure 1: Energy profile of Equatorial Guinea



Energy Consumption and Production

Equatorial Guinea had a population of 790,000 people in 2013 (Table 1) (IEA, 2016). Total electricity production in 2015 was 82 ktoe with 57.3 per cent generated from hydro and 41.4 per cent generated from fossil fuels (IEA, 2016). Electricity consumption in 2015 was 36 ktoe. Table 2 shows the main energy statistics. Key consumption and production statistics are shown in Figures 2 and 3.

Table 1: Equatorial Guinea's key indicators

Key indicators	Amount
Population (million)	0.79
GDP (billion 2005 USD)	9.29
CO ₂ emission (Mt of CO ₂)	6.68

Source: (World Bank, 2015)

Energy Resources

Biomass

The biomass potential is over 400 tonnes/ha (REEEP, undated). Forest biomass covers 57.1 per cent of the land area (World Bank, 2015). Sixty per cent of the population lives in rural areas and since only about 43 per cent these areas are electrified, it is likely that almost 50 per cent use biomass to provide their domestic energy requirements.

Hydropower

The hydropower industry is quite underdeveloped, with only 1 MW of installed capacity in 2011 (WEC, 2013); (REEEP, undated). Hydropower potential is estimated at 2,600 MW; about 50 per cent of this is viable for commercial exploitation.

Oil and natural gas

The proven recoverable oil reserves by the end of 2011 were 1,100 million barrels and oil production at the end of the same year was 91,625 thousand barrels (WEC, 2013). Oil is the country's most important export with exports of crude oil amounting to 318,120 barrels per day (WEC, 2013).

By the end of 2011, proven recoverable resources of natural gas were 36.8 bcm (1,299.6 bcf) and natural gas production was 36.8 bcm (WEC, 2013). The natural gas reserves are located off Bioko Island and are mainly in the Zafiro and Alba oil and gas fields. The Alba field was discovered in 1984 and

Figure 2: Total energy production, (ktoe)

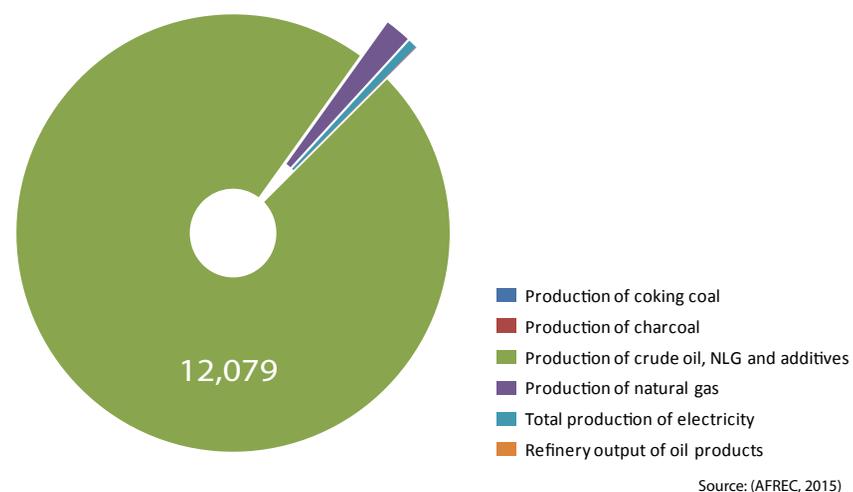


Figure 3: Total energy consumption, (ktoe)

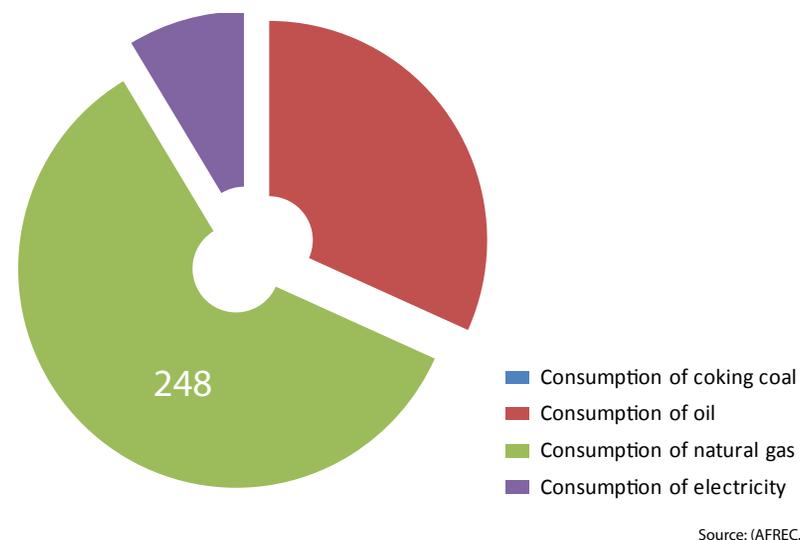


Table 2: Total energy statistics (ktoe)

Category	2000	2005	2010	2015 P
Production of coking coal	-	-	-	-
Production of charcoal	0	0	7	7
Production of crude oil, NLG and additives	5,477	16,731	14,387	12,079
Production of natural gas	1	43	216	237
Production of electricity from biofuels and waste	0	0	0	0
Production of electricity from fossil fuels	3	7	34	34
Production of nuclear electricity	-	-	-	-
Production of hydro electricity	0	1	1	47
Production of geothermal electricity	-	-	-	-
Production of electricity from solar, wind, Etc.	0	0	0	1
Total production of electricity	4	7	35	82
Refinery output of oil products	-	-	-	-
Final Consumption of coking coal	-	-	-	-
Final consumption of oil	77	54	269	132
Final consumption of natural gas	1	43	216	248
Final consumption of electricity	3	7	8	36
Consumption of oil in industry	0	0	0	0
Consumption of natural gas in industry	0	0	0	0
Consumption of electricity in industry	0	0	0	0
Consumption of coking coal in industry	-	-	-	-
Consumption of oil in transport	0	0	0	0
Consumption of electricity in transport	-	-	-	-
Net imports of coking coal	-	-	-	-
Net imports of crude oil, NGL, Etc.	-5,606	-16,731	-14,901	-13,878
Net imports of oil product	77	54	229	269
Net imports of natural gas	0	0	0	0
Net imports of electricity	0	0	0	0

- : Data not applicable

0 : Data not available

(P): Projected

(AFREC, 2015)

Zafiro began production in 1996. Oil production originates almost entirely from the Zafiro, Ceiba, and Okume fields. Condensate production comes from the Alba field (WEC, 2013).

Wind

Wind speeds averaging 6 m/s at heights of 80 m have been measured in the southern area of the mainland. But there are currently no wind power projects in the country (REEEP, undated).

Geothermal

Bioko Island is of volcanic origin (REEEP, undated).

Solar

The heavy forest and biomass cover across the country means that average daily horizontal irradiation is 2.0-2.5 kWh/m²/day, which is too low for large-scale power generation. But there are opportunities for smaller-scale exploitation, such as to heat water (REEEP, undated).

dvdLws / Flickr.com / CC BY 2.0



Oil platform, Equatorial Guinea

Tracking progress towards sustainable energy for all (SE4All)

The national electrification rate in 2012 was 66 per cent ; 43 per cent of rural areas are electrified and 93.1 per cent of urban areas (Table 3) (World Bank, 2016). The electricity sector is a major focus of the national development strategy. The Action Plan for 2020 commits to providing the country and its population with basic needs for development. The country's "Electricity for All" statement aims to establish an efficient and reliable electricity system.

Fifty-five per cent of the national population uses modern fuels (Table 3 and Figure 4). When disaggregated by location, only 25 per cent of the rural population uses non-solid fuels compared to 91 per cent in urban areas (World Bank, 2015).

The energy intensity (the ratio of the quantity of energy consumption per unit of economic output) was 5.8 MJ per US dollar (2005 dollars at PPP) in 2012. The compound annual growth rate (CAGR) between 2010 and 2012 was 4.74 (World Bank, 2015).

The share of renewable energy in the total final energy consumption (TFEC) has been decreasing steadily since 1990. In 2012, renewables accounted for 29.2 per cent of the final energy mix. Traditional solid biofuels form the biggest share of renewable sources at 29.0 per cent of TFEC in 2012, while hydro

Table 3: Equatorial Guinea'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	57	61	65	66		
	7.1.2 Per cent of population with primary reliance on non-solid fuels	28	43	53	55.06		
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	82.0	53.2	15.4	29.2		
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)	-	-	-	-		
	Level of primary energy intensity(MJ/\$2005 PPP)	15.4		5.3	5.8	5.71	5.77

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

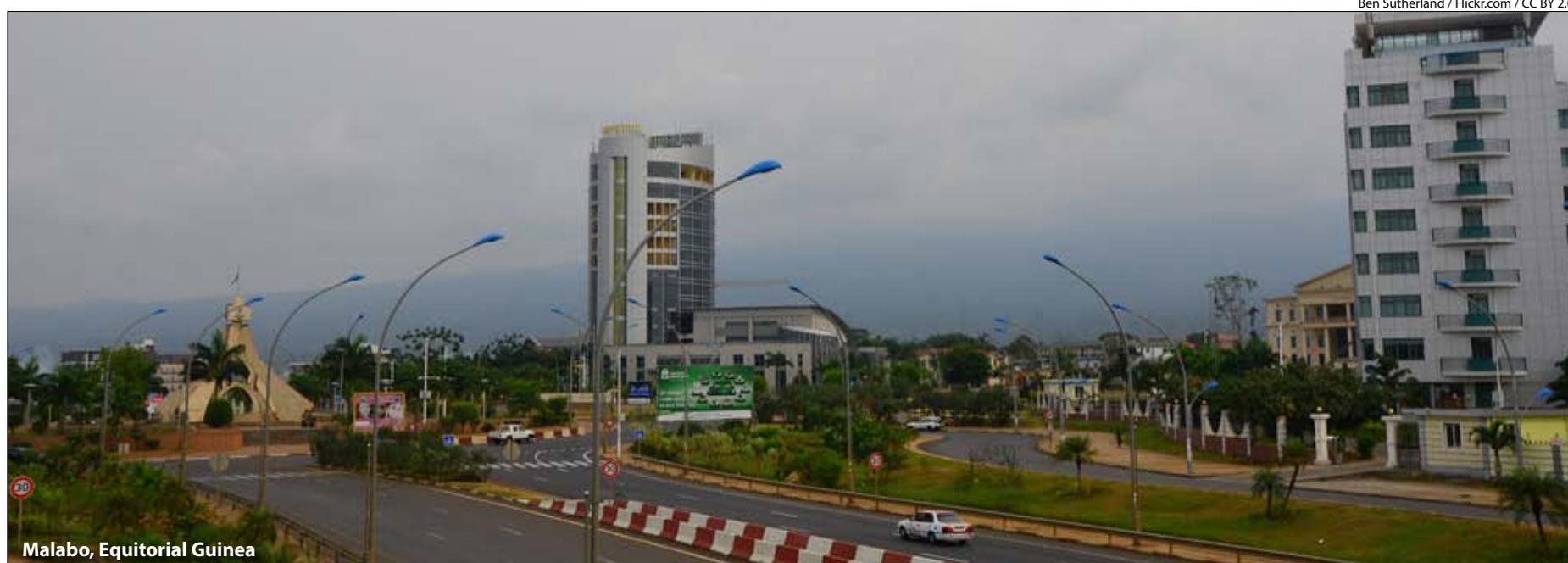
Figure 4: SDG indicators

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
66%	55.06%	14.37	29.82%
			

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

INDC
*Develop and adopt a Law on Energy
*Harnessing the hydroelectric potential of the Wele River for the electrification of the entire Continental Region of the country
*Reform and renovate hydroelectric plants of Musola (0.4-0.5 MW) and Riaba (3.8 MW) for the electrification of the entire Bioko Island and Bikomo in the Continental Region (3.2 MW)
*Consider wind, solar and/or tidal options for remote islands of the country (Annobón, Corisco, and others).

Source: (ROC, 2015)



Malabo, Equatorial Guinea

Ben Sutherland / Flickr.com / CC BY 2.0

Table 5: Equatorial Guinea'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	The Ministry of Mines, Industry and Energy
Presence of a Functional Energy Regulator	Electricity Energy Regulatory Agency
Ownership of sectoral resources and markets (Electricity/ power market; liquid fuels and gas market)	National oil company is GEPetrol
Level of participation in regional energy infrastructure (Power Pools) and institutional arrangements	Central African Power Pool (CAPP)
Environment for Private Sector Participation	
Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies)	Electricity productions are SEGESA Holdings, SEGESA Generation, SEGESA Transmission and SEGESA Commercial. SEGESA holdings and SEGESA generation can both generate electricity
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)	
Extent to which Downstream services and operations are privatized or state-owned, or a mixture (extent)	
Presence of Functional (Feed in Tariffs) FIT systems	
Presence Functional IPPs and their contribution	Legislation is being proposed to allow IPPs to operate
Legal, Policy and Strategy Frameworks	
Current enabling policies (including: RE; EE; private sector participation; & PPPs facilitation) (list 5 max) most critical ones	National energy policy is confined to the Hydrocarbons Law
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	<ul style="list-style-type: none"> • Fundamental Law • Hydrocarbons Law No. 8/2006 • Petroleum Regulations issued under the Hydrocarbons law • Decree Law No. 1/1986 and Decree Law No. 4/2004 on taxation of petroleum-related activities • Decree number 03/2002 of 21 May sets the tariffs for the production of electricity • Regulation 02/24 that sets the conditions for approval of priority national and transboundary projects • Law Decree 20/2005 that allows for the transformation of the electricity sector

This table was compiled with material from (REEEP, 2012), (Colón & Gerena, 2014) and (Lexadin, 2010)

contributed only 0.8 per cent . Renewable sources contributed 6.3 per cent share of electricity generation in 2012 (World Bank, 2015).

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

The energy-related Intended Nationally Determined Contributions (INDC) were articulated by the government in 2015 and aim to enhance the exploitation of renewable forms of energy. They are highlighted in Table 4.

Institutional and Legal Framework

The Ministry of Mines, Industry and Energy is in charge of the energy sector (Table 5). The energy regulator is the Electricity Energy Regulatory Agency. The Electricity sector is managed by *Sociedad de Electricidad de Guinea Ecuatorial* (SEGESA), which has a number of subsidiaries: SEGESA Generation, SEGESA Transmission and SEGESA Commercial. On a regional level, the country is a member of the Central Africa Power Pool. The legal framework is provided by the Fundamental Law, which contains some provisions on energy. The main sector policy is contained in the Hydrocarbons Law.