



Figure 1: Energy profile of Gabon



Figure 2: Total energy production, (ktoe)

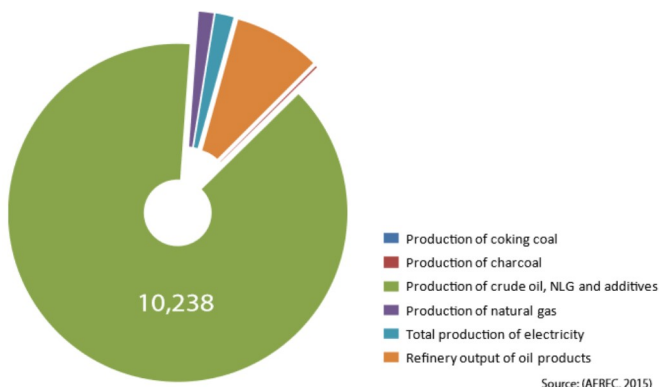
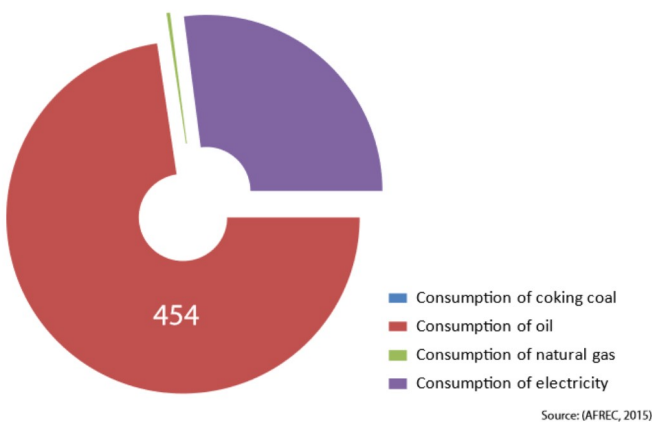


Figure 3: Total energy consumption, (ktoe)



## Energy Consumption and Production

Gabon had a population of 1.67 million in 2013 (Table 1). In 2015, total electricity produced was 199 ktoe with 51.7 per cent produced from hydro and 48.2 per cent from fossil fuels (Table 2). Final consumption of electricity in 2015 was 169 ktoe (AFREC, 2015). Key consumption and production statistics are shown in Figures 2 and 3.

Table 1: Gabon's key indicators

Key indicators	Amount
Population (million)	1.67
GDP (billion 2005 USD)	11.60
CO <sub>2</sub> emission (Mt of CO <sub>2</sub> )	2.83

Source: (World Bank, 2015)

## Energy Resources

### Biomass

Gabon's forests cover a huge portion of the land area and supply an equally large proportion of the country's energy needs (IEA, 2016). Biomass is the predominant energy source used by 80 per cent of the domestic sector (REEEP, 2012). The country has collaborative ventures at international and regional levels for sustainable forest management and energy use through the Central African Forest Initiative and the International Centre for Carbon Sequestration and Biomass Energy. As the formal wood sector grows, there is also potential to use waste from the timber industry to produce energy.

### Hydropower

The topography and high precipitation combine to provide ideal conditions for the generation of electricity from hydro sources. The technically exploitable hydropower by 2011 was 6,000 MW of which only 3 per cent has been exploited (WEC, 2013). The existing power stations include the the Petite Poubara and Grand Poubara dams on Gabon's main waterway – River Ogooué; and two others on the Mbei river the Kinguélé and Tchimbélé dams. The sector is expanding with more projects planned on the Okano, Ngounié and Ouue rivers, totalling 502 MW.

### Oil and natural gas

Gabon has extensive proven recoverable oil reserves, estimated at 3,700 million barrels at the end of 2011. These reserves are the fifth largest in sub-Saharan Africa after Nigeria, Angola, Sudan, South Sudan and Uganda. It ranks third largest oil producer in sub-Saharan Africa, after Nigeria and Angola. The oil production figure at the end of 2011 was 91,625 thousand barrels (WEC, 2013). The oil fields are located both on- and offshore and mainly around the Port-Gentil area. Oil production has been declining from a peak of 370,000 in 1997 to 239,000 bbl/d in 2013. Oil consumption is 20 bbl/day (WEC, 2013). There are also natural gas resources with proven reserves at the end of 2011 estimated at 29.0 bcm and production of 8 bcm (WEC, 2013).

**Table 2: Total energy statistics (ktoe)**

Category	2000	2005	2010	2015 P
Production of coking coal	-	-	-	-
Production of charcoal	0	0	15	16
Production of crude oil, NGL and additives	12,885	12,419	11,552	10,238
Production of natural gas	75	94	167	164
Production of electricity from biofuels and waste	1	1	1	1
Production of electricity from fossil fuels	28	48	74	96
Production of nuclear electricity	-	-	-	-
Production of hydro electricity	70	70	78	103
Production of geothermal electricity	-	-	-	-
Production of electricity from solar, wind, Etc.	0	0	0	0
Total production of electricity	99	119	153	199
Refinery output of oil products	601	708	967	952
Final Consumption of coking coal	-	-	-	-
Final consumption of oil	376	456	495	454
Final consumption of natural gas	1	2	2	2
Final consumption of electricity	93	111	137	169
Consumption of oil in industry	165	172	243	225
Consumption of natural gas in industry	1	2	2	2
Consumption of electricity in industry	23	27	35	37
Consumption of coking coal in industry	-	-	-	-
Consumption of oil in transport	101	116	157	146
Consumption of electricity in transport	0	0	1	1
Net imports of coking coal	-	-	-	-
Net imports of crude oil, NGL, Etc.	-12,234	-11,739	-10,519	-9,725
Net imports of oil product	-203	-241	-468	-421
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)

## Wind

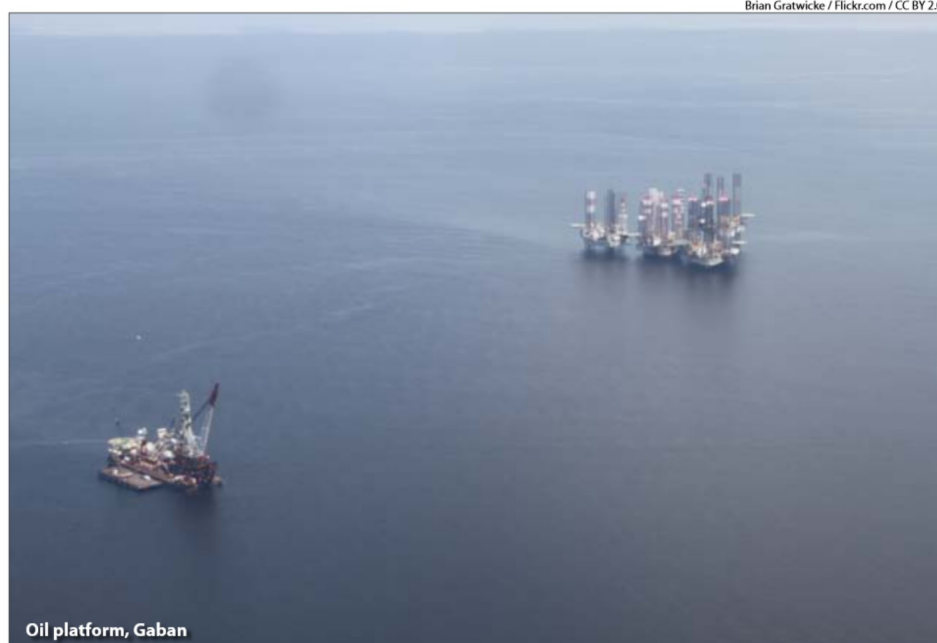
The heavily forested nature of the country reduces the production of wind energy in the interior, but there may be potential along the coast, especially around Pointe Denis and Loango National Park. Average wind speeds of up to 6 m/s have been recorded in parts of the country (REEEP, 2012).

## Geothermal

This is an unexploited area.

## Solar

There are about 300 sunshine days a year, translating into an average daily solar insolation of around 4 kWh/m<sup>2</sup>. Gabon is heavily forested, which presents challenges in connecting communities to the electricity grid, so stand-alone solar systems are ideal to power smaller villages. So far, an €18 million scheme to provide solar to homes, schools and shops is being implemented (REEEP, 2012).



Oil platform, Gabon

Brian Gratwicke / Flickr.com / CC BY 2.0

## Tracking progress towards sustainable energy for all (SE4All)

National access to electricity is relatively high at 89.3 per cent in 2012 (Table 3 and Figure 4) (World Bank, 2016). However, the rate of urbanization far outstrips that of electrification and as a result load shedding is common, negatively impacting the economy. Rural electrification stands at 44.9 per cent while it is 98.1 per cent in urban areas. National access to modern fuels is almost 80 per cent. But this masks local disparities. In rural areas, access to non-solid fuels is only 31 per cent compared to 89 per cent in urban areas (World Bank, 2015); (World Bank, 2016). The 2010-2020 electricity plan aims to make Gabon a sustainable energy platform using an energy mix of biomass, gas and hydro in line with the Gabon Emergent policy. The policy also aims to increase regional cooperation through transmission and energy distribution within the region. To that end, a national transmission network will be constructed between 2010 and 2018 and it will have a national load-dispatching centre (IEEJ, 2013).

The energy intensity (the ratio of the quantity of energy consumption per unit of economic output) was 3.1 MJ per US dollar (2005 dollars at PPP) in 2012. The compound annual growth rate (CAGR) between 2010 and 2012 was -3.80 (World Bank, 2015).





The share of renewable energy in the total final energy consumption (TFEC) was 69.6 per cent. Traditional solid biofuels form the biggest share of renewable sources at 53.4 per cent of TFEC in 2012, while the modern solid biofuels contributed

**Table 3: Gabon'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	73	74	82	89.3		
	7.1.2 per cent of population with primary reliance on non-solid fuels	45	63	76	78.68		
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		78.3	74.5	63.0	69.57	
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)	-	-	12.5	13.2 (2011)		
	Level of primary energy intensity(MJ/\$2005 PPP)	2.7	-	3.4	3.1	3.27	3.15

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
89.3%	78.68%	<b>13.08</b>	69.57%
			

**Table 4: Gabon's key aspects/key mitigation measures to meet its energy Intended Nationally Determined Contributions INDCs**

INDC
*Develop accrued energy efficiency of the economy.
*Develop decarbonized means of production.
*Continue to improve energy efficiency on this basis, with a goal of attaining 4,000 GWh of consumed electricity toward horizon 2025.
*Put in place an ambitious plan to develop hydroelectricity with the goal of reaching 85 per cent of total electricity generation from hydroelectric plants and 20 per cent from gas plants by 2025.
*Decrease GHGs emissions by 9,000 GgCO <sub>2</sub> over 2010-2025 period, being 31 per cent related to the trend-based scenario (48 per cent in 2025).
*Export up to 5,000 GWh of electricity over the same period of 2010-2025.
*Develop a solar electrification plan for remote villages. This plan will allow improving energy access in rural areas without having to use fossil fuel.

Source: (ROC, 2015)

**Table 5: Gabon'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	<ul style="list-style-type: none"> <li>• Ministry of Mines, Petroleum and Hydrocarbons; and</li> <li>• Ministry of Energy and Hydraulic Resources</li> </ul>
Presence of a Functional Energy Regulator	<ul style="list-style-type: none"> <li>• Water and Energy Sector Regulatory Agency 2010.</li> </ul>
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	<ul style="list-style-type: none"> <li>• Central Africa Power Pool</li> </ul>
Environment for Private Sector Participation	
Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies)	<ul style="list-style-type: none"> <li>• Société d'Electricité et d'Eaux du Gabon (SEEG) is state owned and vertically integrated</li> </ul>
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)	<ul style="list-style-type: none"> <li>• The Gabon Oil Company, formed in 2011 by Presidential Decree, operates two fields Obangue and Remboue in partnership with international companies.</li> </ul>
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	
Legal, Policy and Strategy Frameworks	
Current enabling policies (including: RE; EE; private sector participation; & PPPs facilitation) (list 5 max) most critical ones	<ul style="list-style-type: none"> <li>• The Energy Policy 2006</li> <li>• Industrialization Policy</li> <li>• Gabon Emergent policy</li> </ul>
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"> <li>• Plans to update the oil and gas law</li> <li>• Exploration and Production Contract (ESPC) established by Law No. 14/82 in January 1983</li> <li>• Mining Code was established by Law No. 15/62 (1962)</li> <li>• Decree No. 981/PR (1970) and modified under Ordinance 45/73 (1973)</li> </ul>

This table is compiled with material from (REEEP, 2014) and (Rai, Kaur, Fikreyesus, & Kallore, 2013)

31.0 per cent and hydro 3.2 per cent (World Bank, 2015). Renewable sources contributed a 41.7 per cent share of electricity generation in 2012 (World Bank, 2015) and the country target is 70 per cent by 2020 (REN21, 2014). Gabon aims to have 80 per cent of energy provided by renewables by 2020.

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

Gabon has committed to contributing to addressing the problem of climate change. The country articulated its Intended Nationally Determined Contributions (INDC) in 2015. The energy-related commitments are given in Table 4.

### **Institutional and Legal Framework**

Two ministries — the Ministry of Mines, Petroleum and Hydrocarbons and the Ministry of Energy and Hydraulic Resources — have joint responsibility for the energy sector (Table 5). The energy regulator is the Water and Energy Sector Regulatory Agency 2010. The *Société d'Electricité et d'Eaux du Gabon* (SEEG) is the sole generator, transmitter and distributor of electric energy. On a regional level, the country is a member of the Central Africa Power Pool. The main sector policy is the Energy Policy 2006.