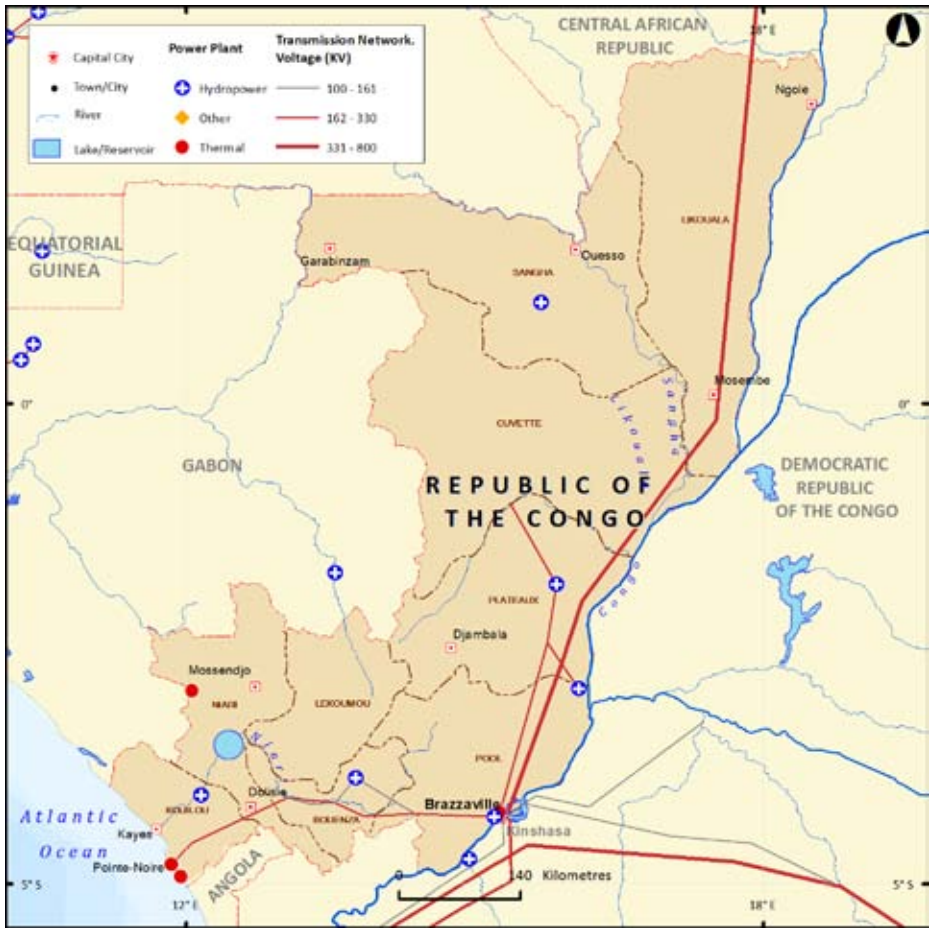
Republic of the Congo

Figure 1: Energy profile of the Republic of the Congo



Energy Consumption and Production

The Republic of the Congo had a population of 4.45 million people in 2013 (Table 1). In the same year, it produced a total of 14,977 ktoe of energy. The Republic of the Congo's primary energy supply was 14.98 Mtoe in 2013 (IEA, 2016). Industry consumed 2 per cent , transport 22.9 per cent and other sectors (residential, agriculture, commercial and other unspecified sectors), 50.7 per cent . Electric power consumption was 0.23 MWh per capita in 2013 (IEA, 2016).

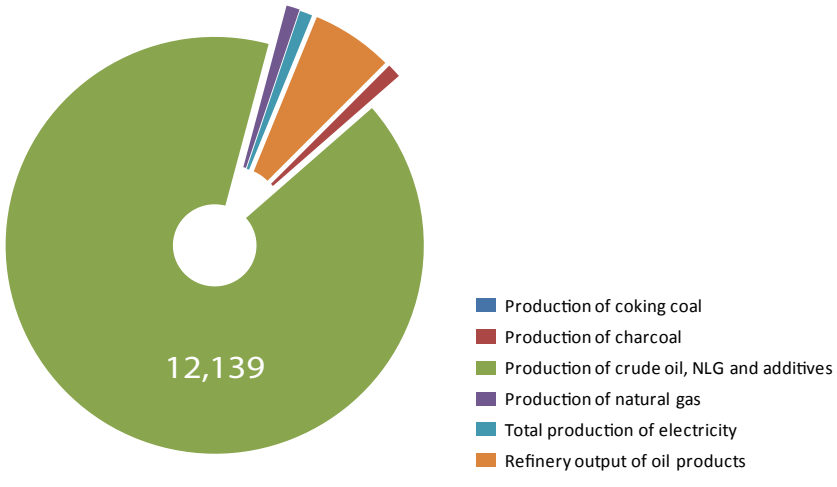
Electricity production in 2015 was 132 ktoe with 61 per cent from hydro and 38.6 per cent from fossil fuel sources (Table 2). Final electricity consumption in the same year was 127 ktoe with 21.2 per cent consumed by industry (AFREC, 2015). Key consumption and production statistics are shown in Figures 2 and 3.

Table 1: The Republic of the Congo's key indicators

Key indicators	Amount
Population (million)	4.45
GDP (billion 2005 USD)	8.72
CO_2 emission (Mt of CO_2)	2.34

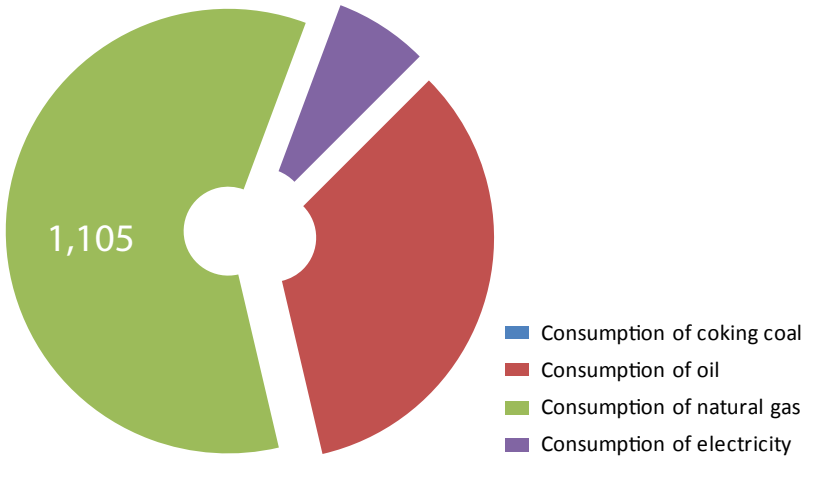
Source: (World Bank, 2015)

Figure 2: Total energy production, (ktoe)



Source: (AFREC, 2015)

Figure 3: Total energy consumption, (ktoe)



Source: (AFREC, 2015)

Energy Resources

Biomass

Wood and charcoal are the main sources of energy, mainly for cooking and especially in rural areas. Significant biomass energy potential exists in the country and there is much forestry for wood energy. Other potential exists in the form of palm oil for biodiesel. About 12 million acres of land with biomass potential for energy has been identified (REEEP, 2012).

Hydropower

Hydropower installed capacity in 2011 was 89 MW and accounted for 78 per cent of total net electricity generation (WEC, 2013). Although this country has huge potential for hydropower generation, estimated at 2,500 MW, less than 5 per cent has been developed. There are currently three hydroelectric dams: Imboulou (120 MW), Moukoukoulou (74 MW) and Djoué (15 MW). The government is looking for investors to participate in the planned Sounda Gorge dam, with an estimated capacity of 1,200 MW (REEEP, 2012).

Oil and natural gas

Up to 80 per cent of government revenues and 90 per cent of exports come from the oil sector. The proven recoverable reserves of oil at the end of 2011 were 1,600 million barrels, the 5th largest proven reserves in sub-Saharan Africa. Production figures at the end of the same time period were estimated at 111.4 million barrels (WEC, 2013). Congo is a mature oil producer, and recent offshore discoveries in 2008 boosted oil output. The country is currently the 7th largest oil producer in sub-Saharan Africa; it is expected to become the 3rd largest in Africa by 2017 when recent potential oil finds (the Moho Nord project) come on stream (Martin, Toothill, & Moussavou, Hunting the Pre-Salt, 2009).

Table 2: Total energy statistics (ktoe)

Category	2000	2005	2010	2015 P
Production of coking coal	-	-	-	-
Production of charcoal	108	126	132	144
Production of crude oil, NLG and additives	12 757	11 294	14 264	12 139
Production of natural gas	0	50	94	138
Production of electricity from biofuels and waste	0	0	0	0
Production of electricity from fossil fuels	0	6	31	51
Production of nuclear electricity	-	-	-	-
Production of hydro electricity	26	31	37	81
Production of geothermal electricity	-	-	-	-
Production of electricity from solar, wind, Etc.	0	0	0	0
Total production of electricity	26	37	67	132
Refinery output of oil products	399	431	657	847
Final Consumption of coking coal	-	-	-	-
Final consumption of oil	213	311	522	630
Final consumption of natural gas	0	112	870	1 105
Final consumption of electricity	33	50	52	127
Consumption of oil in industry	16	12	34	56
Consumption of natural gas in industry	-	-	-	-
Consumption of electricity in industry	12	23	21	27
Consumption of coking coal in industry	-	-	-	-
Consumption of oil in transport	156	281	452	534
Consumption of electricity in transport	0	0	0	0
Net imports of coking coal	-	-	-	-
Net imports of crude oil, NGL, Etc.	-12 047	-11 294	-13 428	-11 680
Net imports of oil product	-465	-488	-215	-147
Net imports of natural gas	0	0	0	0
Net imports of electricity	23	36	24	5

(AFREC, 2015)

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

Natural gas

The production of natural gas in 2011 was 90.6 bcm (WEC, 2013). Congo holds the 5th largest proven natural gas reserves in sub-Saharan Africa but lack of sufficient infrastructure has led to only 15 per cent being monetized. Sixty-eight per cent was reinjected to boost oil production and the remaining 17 per cent was flared or vented, since the costly infrastructure (pipelines, power plants and other infrastructure) are wanting. However, flaring has environmental concerns due to the emissions created and from the economic wastage of an energy resource. Two constructed gas-fired electric power stations have had the twin purpose of increasing the electricity capacity and reducing gas flaring — the Centrale Electrique du Congo (CEC), at 300 MW, and Centrale Électrique de Djeno (CED), with 50 MW (WEC, 2013).

Oil sands

Studies have indicated the possibility of large oil sands deposits. These are unusual petroleum deposits of bitumen also known as tar sands. Exploration is on-going. In the Congo Basin, there are two main tar sands bitumen deposits covering a combined area of about 1,800 km^2 with between 500 million and 2.5 billion bbl recoverable (TarSandsWorld, 2014). After Madagascar, Congo is the second country in Africa that may begin commercial production from oil sands before the decade ends.

Recent indications point to pre-salt oil deposits in shallow waters just off the coastline. The resources are estimated at 1.2 billion bbl of oil and about 1.0 trillion cu ft of gas (Koning, 2014).

Peat

The area of peat land is 6,220 square kilometres (WEC, 2013).

Wind

There are some areas in the north and south where wind speeds of between 5.5 to 6.0 m/s have been identified as possible locations for wind power generation (REEEP, 2012). But on the whole, wind energy technologies are in their infancy and the installed capacity is minimal.

Geothermal

Currently, no geothermal resources have been identified in the country, and no major studies into the potential resource have been conducted (REEEP, 2012).

Solar

Average insolation ranges between 2.0 and 3.0 $kWh/m^2/day$ (REEEP, 2012). The potential for solar in Djiri is currently being explored by the *Programme National de Développement des Energies Nouvelles et Renouvelables* (ENR). However, exploitation of this resource will be hindered by the heavily forested nature of this country.

Tracking progress towards sustainable energy for all (SE4All)

The electricity sector is grossly inadequate with research from 2008 indicating that the existing infrastructure is insufficient to serve the growing population (Balkiabiya, 2008). This shortcoming affects transmission and distribution such that even by rehabilitating strategic infrastructure such as the Imboulou dam, problems still remain (Koua & Pr Yang, 2015). Since 2010, investment in gas-fired power stations has helped to increase electricity capacity in Point-Noire, but there is still a reliance on electricity imports from the neighbouring Democratic Republic of the Congo (DRC) to meet growing power demand in urban areas.

Despite the rich energy resources, less than half of the population of the Republic of the Congo has access to electricity; only 11.7 per cent of rural and 58.9 per cent of urban areas are electrified (World Bank, 2016) (Table 3 and Figure 4). This is due to a severe deficiency in electricity infrastructure as a result of the civil war. Until the distribution network is improved, biomass will remain the major fuel, especially in the countryside. Only a quarter of the population uses modern fuels. This figure is very low in the rural areas (5 per cent) but higher in urban areas (36 per cent) (World Bank, 2015).

The energy intensity (the ratio of the quantity of energy consumption per unit of economic output) of the economy was 2.9 MJ per US dollar (2005 dollars at PPP) in 2012, down only slightly from 2.6 MJ per US dollar in 1990. The compound annual growth rate (CAGR) between 2010 and 2012 was 2.29 (World Bank, 2015).

Table 3: The Republic of the Congo's progress towards achieving SDG7 – Ensure access to affordable, reliable, sustainable and modern energy for all

Target	Indicators	Year					
		1990	2000		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	24	21	37	41.6		
	7.1.2 Per cent of population with primary reliance on non-solid fuels	3	15	23	24.83		
7.2 By 2030, increase substantially the share of renewable energy in the total final energy consumption	7.2.1 Renewable energy share in the total final energy consumption	66.7	72.7	50.6	48.19		
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)			15.1	14.2		
	Level of primary energy intensity(MJ/$2005 PPP)	2.6		2.8	2.9	-	-

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

Figure 4: SDG indicators

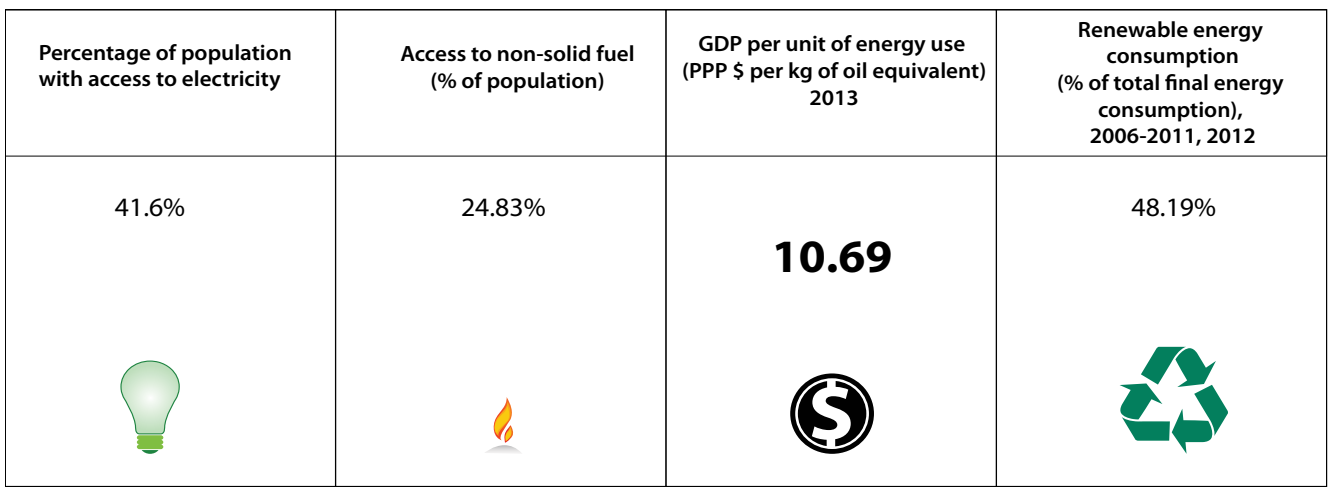


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Table 4: The Republic of the Congo's key aspects/key mitigation measures to meet its energy Intended Nationally Determined Contributions (INDCs)

INDC
Increase the electricity share in its energy mix with a target of about 4,000 GWh of consumed electricity toward 2025 horizon.
Develop a solar electrification plan for remote villages (Congo Energy Strategy 2015-2025).

Source: (ROC, 2015)

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Eni Mboundi oil field, Republic of Congo

Table 5: The Republic of the Congo'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 Mines, Energy, and Water Resources • Societe Nationale des Petroles du Congo (SNPC) • National Agency for Rural Electrification (ANER)
Presence of a Functional Energy Regulator	Regulatory Agency for the Electricity Sector (ARSEL)
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	Central Africa Power Pool (CAPP)
Environment for Private Sector Participation	
Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies)	State owned National Electricity Company (SNE)
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)	• Société Nationale des Pétroles du Congo (SNPC) • Gaz-Congo, Elf and Agi (LNG) • Eni
Extent to which Downstream services and operations are privatized or state-owned, or a mixture (extent)	Perenco, Murphy Oil, Africa O&G, Prestoil, Chevron, and SOCO Internationals.
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	
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	• Law No 14-2003 of April 10, 2003 on the Electricity Code • Law No 17-2003 of April 10, 2003 creating the development funds for electricity sector (FDSEL) • Law No 16-2003 of April 10, 2003 creating the regulatory agency for electricity sector (ARSEL) • Law No 15-2003 of April 10, 2003 creating the National Agency for Rural Electrification (ANER); • Decree No 2010-241 of March 16, 2010 on the organization of the Ministry of Energy and Hydraulics

This table was compiled with material from (REEEP, 2012)

The Republic of the Congo also has extensive hydropower potential, but most of it remains untapped. The share of renewable energy in the total final energy consumption (TFEC) has been on the decline after a small spike to 72.7 per cent in 2000 before falling to just under 50 per cent in 2012.

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

By 2000, hydrocarbons represented almost a quarter of direct emissions, leaving much room for emissions-reduction measures (ROC, 2015). The Republic of the Congo aims to do this partly by developing more of its rich hydro-electricity resources with the objective of increasing the share of electricity from hydro sources to 85 percent by 2025 (ROC, 2015). The energy-related INDC statements are listed in Table 4.

Institutional and Legal Framework

The Ministry of Energy and Hydraulics is in charge of the energy sector (Table 5). The energy regulator is Regulatory Agency for the Electricity Sector (ARSEL). The state owned *Société National d'Electricité* (SNE) is responsible for electricity generation and supply. On a regional level, the country is a member of the Central African Power Pool. The legal framework is provided by the Law No 14-2003 of April 10, 2003 on the Electricity Code.