



Figure 1: Energy profile of the Democratic Republic of the Congo

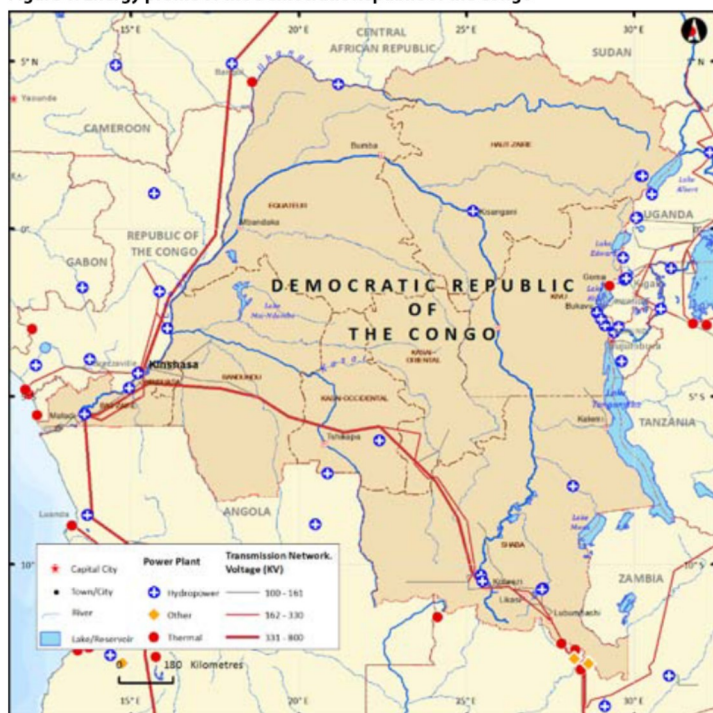
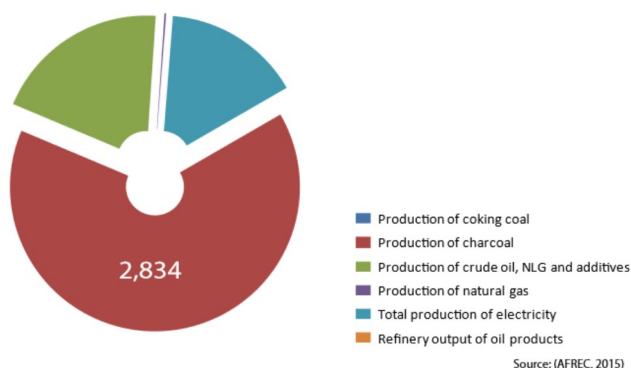
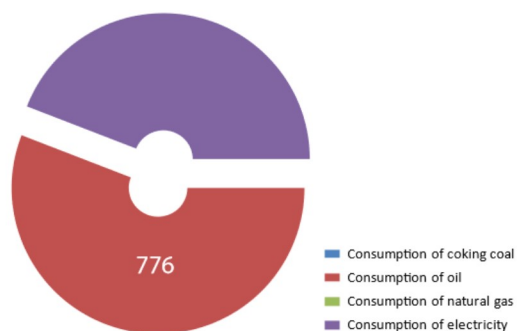


Figure 2: Total energy production, (ktoe)



Source: (AFREC, 2015)

Figure 3: Total energy consumption, (ktoe)



Source: (AFREC, 2015)

Energy Consumption and Production

In 2013, the DRC had a population of 67.51 million people (Table 1). Electricity production in 2015 was 676 ktoe with 99.7 per cent of it produced from hydro sources. Final consumption of electricity in the same year was 613 ktoe (Table 2) (AFREC, 2015). Key consumption and production statistics are shown in Figures 2 and 3.

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

| Key indicators | Amount |
|---|--------|
| Population (million) | 67.51 |
| GDP (billion 2005 USD) | 19.46 |
| CO ₂ emission (Mt of CO ₂) | 2.63 |

Source: (World Bank, 2015)

Energy Resources

Biomass

The DRC has around 125 million hectares of forest, representing 67.7 per cent of the country's land base (World Bank, 2015d). Most of the primary energy consumption is supplied by wood from these forests. There is also potential for biogas from plant and animal wastes. However, there are some barriers to development, including the high cost of digesters in relation to average incomes and the lack of training of users and maintenance staff.

Hydropower

The DRC has huge hydropower resources, estimated at 774 GWh, the highest in Africa. It is estimated that if developed, this resource has the potential to create revenues for the country of over 6 per cent of GDP. The current level of exploitation is about 3 per cent of the country's economically exploitable capability and hydro provides almost all the country's electricity. The national electricity organization has 17 hydro plants with a total rated capacity of 2,410 MW. The two largest are Inga 1 (351 MW) and Inga 2 (1,424 MW) with new plants Inga 3 (4,320 MW) and Inga 4 in the planning phase (WEC, 2013).

Table 2: Total energy statistics (ktoe)

| Category | 2000 | 2005 | 2010 | 2015 P |
|---|--------|--------|--------|--------|
| Production of coking coal | 54 | 67 | 0 | 0 |
| Production of charcoal | 208 | 452 | 535 | 2,834 |
| Production of crude oil, NLG and additives | 1,092 | 1,185 | 1,076 | 864 |
| Production of natural gas | 0 | 0 | 8 | 8 |
| Production of electricity from biofuels and waste | 0 | 0 | 0 | 0 |
| Production of electricity from fossil fuels | 2 | 2 | 1 | 1 |
| Production of nuclear electricity | - | - | - | - |
| Production of hydro electricity | 516 | 636 | 653 | 674 |
| Production of geothermal electricity | - | - | - | - |
| Production of electricity from solar, wind, Etc. | 0 | 0 | 0 | 1 |
| Total production of electricity | 518 | 638 | 653 | 676 |
| Refinery output of oil products | - | - | - | - |
| Final Consumption of coking coal | 0 | 0 | 0 | 0 |
| Final consumption of oil | 692 | 1,135 | 619 | 776 |
| Final consumption of natural gas | 0 | 0 | 0 | 0 |
| Final consumption of electricity | 390 | 403 | 581 | 613 |
| Consumption of oil in industry | 14 | 42 | 44 | 48 |
| Consumption of natural gas in industry | 0 | 0 | 0 | 0 |
| Consumption of electricity in industry | 163 | 266 | 341 | 401 |
| Consumption of coking coal in industry | 0 | 0 | 0 | 0 |
| Consumption of oil in transport | 251 | 352 | 525 | 716 |
| Consumption of electricity in transport | 0 | 0 | 0 | 0 |
| Net imports of coking coal | 0 | 0 | 0 | 0 |
| Net imports of crude oil, NGL, Etc. | -1,107 | -1,185 | -1,039 | -1,055 |
| Net imports of oil product | 367 | 525 | 714 | 926 |
| Net imports of natural gas | 0 | 0 | 0 | 0 |
| Net imports of electricity | -390 | -474 | -65 | 0 |

- : Data not applicable

0 : Data not available

(P): Projected

(AFREC, 2015)

**Solar cell charging battery, DRC**

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The massive Grand Inga (40,000 MW) is also planned and through interconnections between power pools, it should promote greater energy trade. Grand Inga plans to supply the following power pools: the South African Power Pool (SAPP), West African Power Pool (WAPP), East African Power Pool (EAPP), Central Africa Power Pool (CAPP) and the *Comité Maghrébin de l'Electricité* (COMELEC) (WEC, 2013).

Oil and natural gas

By the end of 2011, the DRC was estimated to have proven recoverable oil reserves of 1,600 million barrels and production figures at the end of the same year were 8.06 million barrels. Although the DRC has huge oil reserves, there is no oil refinery and all refined petroleum products have to be imported. The eastern part of the country suffers from untimely supply making the costs rise steeply. Data from 2008 showed that the DRC had natural gas reserves of 991.1 million

m³. Proven natural gas recoverable reserves at the end 2011 were 0.1 bcm (WEC, 2013). There was no production, consumption, importation or exportation of natural gas.

Coal

The recoverable coal reserves were estimated at 88 million tonnes by the end of 2011. These reserves are of the bituminous type including anthracite (WEC, 2013).

Wind

Nationwide wind speeds tend to be low, averaging 1.4 m/s. However, in Ugoma, wind speeds of up to 6.6 m/s have been measured. It is estimated that the potential for wind energy is about 77,380 MW, but it is uncertain how much of this is commercially viable (REEEP, 2012).

Geothermal

The eastern part of the DRC where volcanoes and active geothermal sites exist presents huge

potential for the exploitation of geothermal energy. The temperatures in hot springs range from 35 to 90°C, with flow rate averages ranging from 11 to 162 litres/sec. The sector is undeveloped.

Solar

High insolation values ranging from 3.25 and 6.0 kWh/m²/day make the DRC ideally positioned to exploit this resource. Currently, there are over 800 solar systems, with a total power of 83 kW. These are situated in: Equateur (167), Katanga (159), Nord-Kivu (170), the two Kasai provinces (170) and Bas-Congo (170). The Caritas network system has 148 installations with a total capacity of 6.31 kW.

Tracking progress towards sustainable energy for all (SE4All)

Article 48 of the 2006 Constitution provides for the right of access to electricity. Despite this, the electrification rate is very low. In 2012, it was only 16.4 per cent (World Bank, 2016). Table 3 and Figure 4 shows that the proportion of people in rural areas with access to electricity is 5.8 per cent while 36.3 per cent of urban areas are electrified (World Bank, 2016). But there are access deficiencies. For instance, the number of power outages experienced translates into lower rates of electrification due to widespread restrictions in hours of service, voltage fluctuations and impromptu blackouts. For example, Kinshasa is estimated to have an electrification rate of 90 per cent, but although they are connected to the grid, 21 per cent of households receive less than four hours of electricity supply daily, translating into a much lower average electrification rate (World Bank, 2015).

Access to modern fuels is very low. In 2012, only 2 per cent of people in rural DRC were using non-solid fuels and 11 per cent of urban areas (World Bank, 2015).





The energy intensity (the ratio of the quantity of energy consumption per unit of economic output) of the economy was 19.1 MJ per US dollar (2005 dollars at PPP) in 2012, down from 21.2 MJ per US dollar in 2010. The compound annual growth rate (CAGR) between 2010 and 2012 was -4.34 (World Bank, 2015).

Table 3: DRC'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 | 6 | 7 | 15 | 16.4 | | |
| | 7.1.2 Per cent of population with primary reliance on non-solid fuels | 2 | 3 | 5 | 5 | | |
| 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 | 92.0 | 97.2 | 96.2 | 95.96 | | |
| 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) | | | 1.7 | 1.7 (2011) | | |
| | Level of primary energy intensity(MJ/\$2005 PPP) | 11.2 | - | 21.2 | 19.1 | 21.04 | 19.13 |

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 |
|---|---|--|--|
| 16.4% | 5.0% | 2.38 | 95.96% |
|  |  |  |  |

Magharebia / Foter / CC BY



Community farming in DRC

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Table 4: DRC'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"> • Ministry of Energy • National Society of Electricity (SNEL) • Rural electrification • National Energy Commission (NCE) • National Renewable Energies Service (SENEN) • Ministry of Public Health |
| Presence of a Functional Energy Regulator | Electricity Regulation Authority (ARE) |
| Ownership of sectoral resources and markets (Electricity/ power market; liquid fuels and gas market) | <ul style="list-style-type: none"> • Société nationale d'électricité (SNEL) - Public company responsible for production, transport, and distribution of electricity • La Congolaise des Hydrocarbures (Cohydro) • Services des Entreprises Pétrolières Congolaises (SEP-CONGO) |
| Level of participation in regional energy infrastructure (Power Pools) and institutional arrangements | <ul style="list-style-type: none"> • South African Power Pool (SAPP) • Central African Power Pool (CAAP) • East African Power Pool (EAPP) |
| Environment for Private Sector Participation | |
| Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies) | State owned SNEL is a vertically-integrated monopoly electricity production and distribution utility |
| 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) | Perenco (UK), Teikoku Oil (Japan), Cohydro, Tullow Oil (UK), Heritage Oil (Canada), Surestream Petroleum (UK), Energulf Resources (US), ENI (Italy), and SOCO (UK) |
| 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 | National Electrification Fund Energy Sector Policy Letter 2009 |
| 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 | Act number 14/011 of 17 June 2014 to govern the electricity sector Law No. 11/009 of July 2011 is the law on the fundamental principles relating to environmental protection Ordinance-Act No 70-033 of 1970 established state electricity company SNEL Act No 08/007 of 2008 privatized SNEL |

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

The share of renewable energy in the total final energy consumption (TFEC) has remained over 90 per cent since 1990 and contributed 99.6 per cent share of electricity generation in 2012. Traditional solid biofuels form the biggest share of renewable sources at 73.6 per cent of TFEC in 2012, while the modern solid biofuels contributed 19.3 per cent and hydro only 3.1 per cent (World Bank, 2015).

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

The energy-related Intended Nationally Determined Contributions (INDC) published in August 2015 were to raise the population access rate to electricity, which is currently very low: 15 per cent at the national level (1 per cent in

rural areas, 30 per cent in urban areas) whereas the average in sub-Saharan Africa is about 24.6 per cent (RDC, 2015). The rate in 2012 was 16.4 per cent (World Bank, 2016).

Institutional and Legal Framework

The Ministry of Mines, Energy and Hydrocarbons is in charge of the energy sector. The energy regulator is the Electricity Regulation Authority (ARE) (Table 4). The Société Nationale d'Electricité (SNEL) is the sole generator, transmitter and distributor of electric energy. On a regional level, the country participates in the Central African Power Pool, Eastern Africa Power Pool and the Southern Africa Power Pool. The legal framework is provided by Act number 14/011 of 17 June 2014 governing the electricity sector. The main sector policy is the Energy Sector Policy Letter 2009.