



Greenhouse Gas Emissions in Nigeria

Nigeria Numbers at a Glance (2014)

492.44 MtCO₂e*

Total GHG emissions
(1.01% of world total)
World: 48,892 MtCO₂e

176,460,502

Population
World: 7,268,986,176

2.79

tCO₂e per capita
World: 6.73 tCO₂e

US\$ 452,285 Million
GDP**

World: US\$73,479 Billion

1,089

tCO₂e/million US\$ GDP
World: 665 tCO₂e/million US\$ GDP

+98.22 MtCO₂e (+25%)

Change in GHG emissions
(1990-2014)
World: +15,069 MtCO₂e
(+45%)

Sources: WRI CAIT 4.0, 2017. Emissions including Land-Use Change and Forestry. Global Warming Potentials are from the Intergovernmental Panel on Climate Change Second Assessment Report.

*Million metric tons of carbon dioxide equivalent.

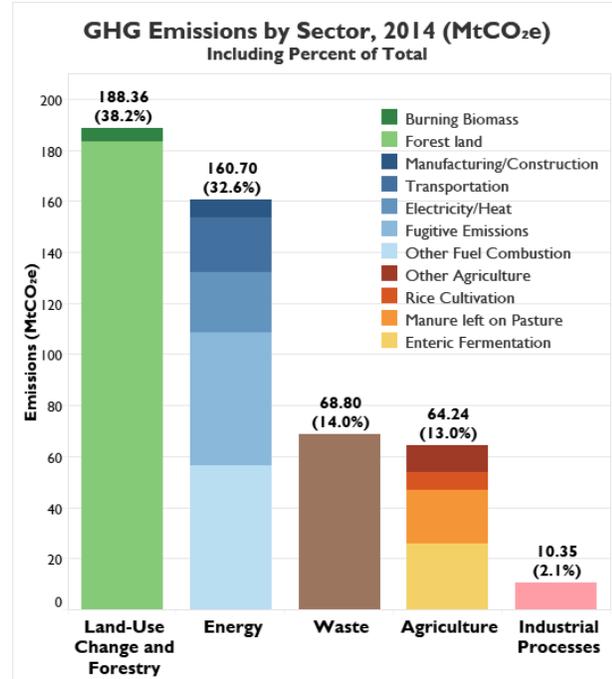
**Gross Domestic Product (GDP) in constant 2010 US\$

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Greenhouse Gas (GHG) Emissions by Sector

According to the World Resources Institute Climate Analysis Indicators Tool (WRI CAIT), Nigeria's 2014 GHG emissions were primarily from the land-use change and forestry (LUCF) sector as well as the energy sector which accounted for 38.2% and 32.6% of the country's total emissions, respectively.¹ Waste, agriculture, and industrial processes (IP) contributed 14.0%, 13.0%, and 2.1% of total emissions each. Within LUCF, emissions were almost entirely from degradation and loss of forest land.²

Nigeria's [First Biennial Update Report \(BURI\)](#) to the UNFCCC, submitted in 2018, includes a GHG inventory for the years 2000 to 2015, which shows that in 2015, the combined emissions from agriculture, forestry, and other land use (AFOLU) were the leading source of GHG emissions (66.9%), followed by energy (28.2%), waste (3.0%) and industrial processes and product use (IPPU) (1.9%).³



Sources: WRI CAIT 4.0, 2017, FAOSTAT, 2018
Note: Totals and percentages may not sum due to rounding

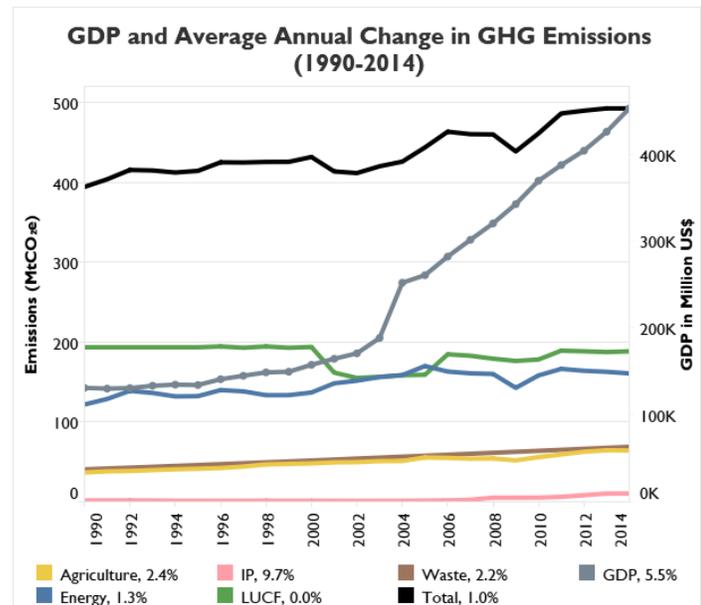
Change in GHG Emissions in Nigeria (1990-2014)

According to WRI CAIT data, Nigeria's GHG emissions increased by 25% (98.22 MtCO₂e) from 1990 to 2014. The average annual change in total emissions was 1% (see the line graph below). The change in emissions from Nigeria's two most significant GHG sources is discussed below.

LUCF: In its BUR, Nigeria notes that the country is well endowed with forest resources, but excessive exploitation is a threat to sustainable socio-economic development. Deforestation is a significant environmental issue because of growing demand for land for other uses, including settlement development, logging, fuel wood extraction, transport facility development, and mining.⁴ Population growth adds pressure to these drivers, having increased 85% from 1990 to 2014 according to WRI CAIT. The UN Food and Agriculture Organization (FAO) found that Nigeria's remaining forest areas will likely disappear by 2020 if the current rate of forest depletion continues unabated.⁵ From 1990 to 2010, FAO data show a decline in total forest area of 48%, from approximately 17.2 million hectares (ha) in 1990 to 9.0 million ha in 2010, leaving 10% of the total land area as forest land in 2010. Nigeria's annual deforestation rate is estimated at 4% for the period 2005 to 2010, higher than the Western and Central African average of 0.46% and among the highest in the world.⁶ As of 2016, forest area was only 7% of the total land area⁷ and virtually all primary forests in the country may have disappeared.⁸

WRI CAIT data show that LUCF emissions decreased by 3% from 1990 to 2014. Most LUCF emissions are from forest land, with relatively small contributions from burning biomass. The decrease in emissions is difficult to explain given the high loss of forest area reported by FAO during the same time frame, and unabated pressure from deforestation drivers. Nigeria is now prioritizing reducing emissions from deforestation and forest degradation (REDD) as part of its national development process and as a green growth development pathway, having been a partner country of the UN-REDD program since 2010.⁹ Its 2015 annual update report details initiatives Nigeria plans to implement, such as developing a national strategy/action plan on the drivers of deforestation, a safeguard information system (SIS), a forest reference level/forest reference emission level (FRL/FREL) system, and a national forest monitoring system.¹⁰

Energy: Nigeria's energy emissions increased 32% from 1990 to 2014, mainly due to other fuel combustion.¹¹ Fugitive emissions, which occur from leaks or other unintended or irregular releases of gases, are a substantial source of GHG emissions but have decreased since 1990, whereas smaller sources of emissions from electricity and heat generation, transportation, and manufacturing and construction have increased. According to the BUR, oil, natural gas, and biomass are the main sources of energy. Nigeria is the world's third largest producer of bioenergy in the form of fuel wood, agricultural residues, and animal and forestry waste; the 2010 bioenergy share of total primary energy was over 80%.¹² Less than half of Nigeria's population has access to grid-connected electricity. Electric power supply is inefficient and has limited industrial development. The 2015 power supply averaged 3.1 gigawatts (GW), an amount estimated to be a third of demand.¹³ With the second largest proven crude oil reserves in Africa, Nigeria exported almost 774,000 barrels in 2014, with oil and gas accounting for 90% of exports and 15% of GDP.¹⁴ Nigeria's production of natural gas is expected to double by 2030. Because of insufficient oil field infrastructure, a very large portion of gas associated with oil production is flared into the atmosphere. Although the amount flared has subsided by over 50% over the past decade, Nigeria remains the world's fifth-largest gas flaring country.¹⁵ In line with its [Intended Nationally Determined Contribution](#) (INDC), Nigeria is developing projects to reduce or eliminate GHG emissions from gas flaring by 2030.



Source: WRI CAIT 4.0, 2017

Carbon Intensity: GHG Emissions Relative to Gross Domestic Product

According to WRI CAIT, Nigeria's GHG emissions increased 25% between 1990 and 2014, averaging 1% annually, while GDP grew 245%, averaging 5.5% annually. Although GDP grew faster than GHG emissions, in 2014, Nigeria's emissions relative to GDP were 1.6 times the world average, indicating potential for improvement.

Climate Change Mitigation Targets and Plans

In its INDC, Nigeria pledged to unconditionally reduce GHG emissions by 20% by 2030, compared to business as usual (BAU) emission levels. It aims to achieve this goal by improving energy efficiency by 20%, providing 13 GW of renewable electricity to rural communities that are currently not connected to the electric power grid, and by ending the flaring of gas. The INDC also describes Nigeria's target to reduce GHG emissions by 45% by 2030, conditioned upon receipt of international support. The key measures to achieve this higher target would be increasing energy efficiency and significantly reducing the use of generators, while providing access to energy for all Nigerians. Overall, the INDC identifies key mitigation measures as: ending gas flaring by 2030, achieving off-grid solar PV generation of 13 GW, making use of efficient gas generators, achieving a 2% yearly increase in energy efficiency (30% by 2030), increasing transportation mode shift from automobiles to buses, improving the electricity grid, implementing climate smart agriculture, and reforestation.¹⁶

¹ World Resources Institute Climate Analysis Indicators Tool (WRI CAIT 4.0, 2017). GHG emissions are reported in units of carbon dioxide equivalents. Global Warming Potentials (GWPs) are the 100-year GWPs from the Intergovernmental Panel on Climate Change (IPCC) [Second Assessment Report \(SAR\)](#).

² Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT). Nigeria, [Emissions – Land use total](#) and [Emissions – Agriculture total](#), viewed on August 19, 2018.

³ Federal Republic of Nigeria. [First Biennial Update Report](#) (BUR1) under the United Nations Framework Convention on Climate Change (UNFCCC). March 2018. GWPs are the 100-year GWPs from the IPCC [Second Assessment Report \(SAR\)](#). Direct comparison of GHG inventory results from different sources and years can be difficult and must consider how emissions are grouped, and how different methodologies and data sources will lead to differences in GHG estimation.

⁴ Ibid.

⁵ FAO 2010, as cited in Federal Republic of Nigeria. BUR I. March 2018.

⁶ FAO. [Global Forest Resources Assessment](#), Global Tables, 2010.

⁷ FAOSTAT. [Statistical Yearbook – Nigeria](#), viewed January 30, 2019.

⁸ FAO. [Global Forest Resources Assessment](#), Global Tables, 2010. See Table 7 Forest Characteristics 2010.

⁹ REDD refers to Reducing Emissions from Deforestation and Forest Degradation. REDD+ also references the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks.

¹⁰ Federal Republic of Nigeria. [Nigeria National Programme 2015 Annual Report \(Draft\)](#), 2015.

¹¹ WRI CAIT 4.0, 2017. Emissions from other fuel combustion include emissions from stationary and mobile sources such as commercial/institutional, residential, or agricultural/forestry/fishing/fish farms. Other fuel combustion also includes biomass combustion.

¹² Federal Republic of Nigeria. BUR I. March 2018. Primary energy demand is the consumption of energy before it has been transformed to other forms of energy. For example, coal is primary energy whereas electricity generated from coal is not. See [Energy Information Administration](#).

¹³ Federal Republic of Nigeria. BUR I. March 2018.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Federal Republic of Nigeria. [Intended Nationally Determined Contribution \(INDC\)](#), 2014.