



Greenhouse Gas Emissions in Liberia

Liberia Numbers at a Glance (2012)

17 MtCO₂e*

Total GHG emissions
(0.04% of world total)

World: 47,599 MtCO₂e

4,190,435

Population

World: 7,043,181,414

4.02

tCO₂e per capita

World: 6.76 tCO₂e

US\$1,155 Million

GDP**

World: US\$55,261 Billion

14,601

tCO₂e/million US\$

GDP

World: 861 tCO₂e/million

US\$ GDP

+1 MtCO₂e (+4%)

Change in GHG

emissions (1990–2012)

World: +13,661 MtCO₂e

(+40%)

Source: WRI CAIT 2.0, 2015

Emissions including Land-Use Change and Forestry

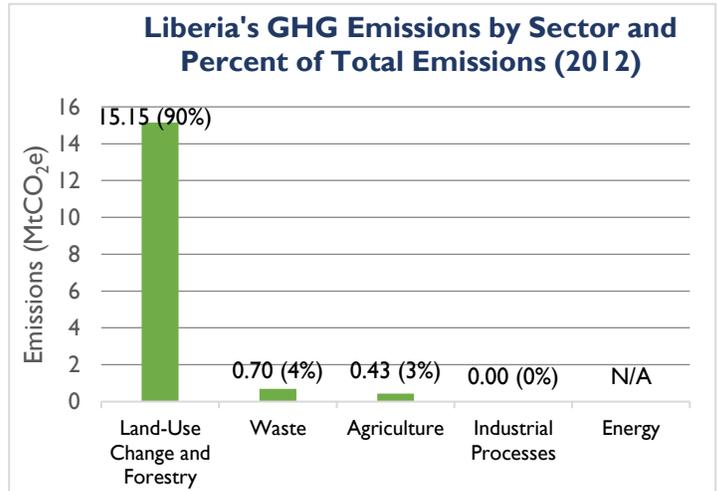
*Million metric tons of carbon dioxide equivalent

**Gross Domestic Product (GDP) in constant 2005 US\$

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Greenhouse Gas (GHG) Emissions by Sector

According to the World Resources Institute's Climate Analysis Indicator Tool (WRI CAIT), Liberia's GHG profile is dominated by net emissions from land-use change and forestry (LUCF), which constituted 90% of total national emissions in 2012. It shows that LUCF has been a net source of GHG emissions since 1990, with more carbon dioxide released than trees and other vegetation took in and stored. GHGs emitted from waste, agriculture, and industrial processes are relatively insignificant. Neither WRI CAIT nor the International Energy Agency provides energy sector emissions data for Liberia.



Source: WRI CAIT 2.0, 2015

Note: Percentages do not add up to 100% due to limited data availability

[Liberia's Initial National Communication \(INC\)](#) to the UNFCCC tells a different story. The INC includes a national GHG inventory for the year 2000, which shows that the uptake and storage of carbon dioxide in 2000 was more than the amount emitted. This resulted in the overall removal of 96.8 MtCO₂e from the atmosphere by Liberia's LUCF sector. The INC also provides energy sector emissions information based on data from the Liberia Petroleum Refining Corporation, the Liberia Electric Corporation, National Energy Policy, Ministry of Transport, and other data collected and processed by the GHG emissions inventory team. The INC identifies energy as the leading source of Liberia's emissions, emitting 5.4 MtCO₂e, followed by the agriculture sector with 2.6 MtCO₂e, and the waste sector with 0.5 MtCO₂e in 2000.

WRI CAIT provides no explanation for why energy emissions data are not available, and cautions that errors and uncertainties associated with LUCF estimates may be significant. Liberia's INC cautions that the GHG inventory was incomplete due to missing data, particularly for the forestry, agriculture, and waste sectors. Despite the differences in the information presented by the WRI CAIT database and the INC, it can be concluded that LUCF and energy activities are important areas for climate change mitigation.

Change in GHG Emissions in Liberia (1990-2012)

According to WRI CAIT (excluding energy emissions), Liberia's emissions grew 4% from 1990-2012.¹ As illustrated on the graph on the next page, WRI CAIT show the average annual change in total emissions during this time (excluding energy emissions) to be flat (0% change), with sector-specific annual change as follows: LUCF (0%), waste (2%), agriculture (2%), and industrial processes (85%). The INC indicates the change in energy emissions during an earlier time frame, from 1986 (prior to Liberia's civil war) to 2000, which it reports to be a reduction of energy sector emissions of almost 77%.

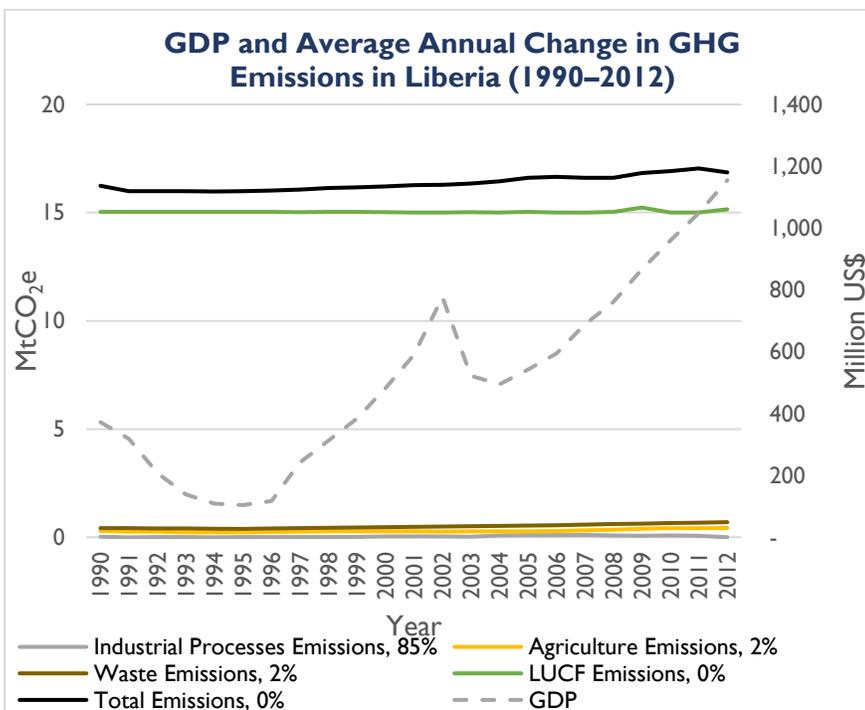
¹ World Resources Institute Climate Analysis Indicators Tool (WRI CAIT) 2.0, 2015.

LUCF: The INC states that the forest cover of Liberia is about 45% of the total land area, a figure that is corroborated for 2011 by the UN FAO,² and estimates an annual deforestation rate of 0.2%, or 2.6% forest loss per year. Logging (including rampant illegal logging), high demand for charcoal, and the use of firewood for cooking and heating are prominent drivers of deforestation. Other drivers include farming, hunting, settlement, mining, plantations, and road building. The INC projects that stricter enforcement of forest regulations and concessions will reverse deforestation.

Energy:³ Liberia's [Intended Nationally Determined Contribution \(INDC\)](#) notes that energy is the leading source of GHGs due primarily to the use of petroleum products, firewood, charcoal, and palm oil. The INC reports that petroleum products (primarily gasoline and diesel, and some jet fuel and kerosene) supply over 95% of the country's primary energy and are entirely imported. A decline in energy supply from 2000-2003 was followed by very rapid growth in consumption from 2003-2008. Consumption of petroleum products increased by 66% from 1999 to 2008, with transportation consuming 61%, and electricity generation (which uses gasoline and diesel oil) 29% in 2008. During the civil war, which devastated the road network, the number of vehicles (sedans, Jeeps, trailers, trucks, and buses) declined to 5,660 in 2003. By 2005, the vehicle population had partially recovered, reaching 10,150. Most vehicles are poorly maintained and consume low grade diesel and mixed petroleum fuel that have high potential for GHG emissions.

Electricity generation is also recovering from the impacts of the war. Prior to the war, the country's total installed generation capacity was 412.7MW, of which the power parastatal Liberia Electric Corporation (LEC) owned 195MW. In 2012, LEC's installed generation capacity stood at 22.6MW, with the rest produced by the private sector. Bringing hydropower generation back on stream can slow emissions growth in the 2010s. Liberia also has strong potential for biomass power generation and enormous solar energy potential due to its location in the equatorial belt.

Only 10% of the urban population has access to electricity, and none of the rural population. Under 2% of the rural population has even private access to electricity. As of 2004, 95% of Liberians relied on firewood, charcoal and palm oil.



Carbon Intensity: GHG Emissions Relative to Gross Domestic Product (GDP)

The graph on the left does not include energy sector GHG emissions, which Liberia's INC identifies as being a significant source. With Liberia's carbon intensity in 2012 almost 17 times the world average, there is substantial potential to reduce Liberia's GHG emissions relative to GDP.

Climate Change Mitigation Targets and Plans

Liberia's INDC identifies four mitigation scenarios which, combined, have the potential to reduce GHGs from projected business-as-usual (BAU) emissions in 2030 by 15% (797,000 tCO₂e).

Achieving the target is conditioned upon receipt of financial resources, capacity building, and technology transfer by the

international community. Liberia states that the INDC is a platform to integrate its low carbon development strategy into its long-term sustainable development strategy, "[Vision by 2030](#)." To achieve the Vision 2030 Liberia adopted the [Agenda for Transformation \(AfT\)](#), whose fifth pillar addresses cross-cutting issues, including the environment. The INDC planning process draws on the AfT. Liberia's [National Energy Policy \(2009\)](#) includes a target to reduce GHG emissions by 10% by 2030, and the country has a long-term strategy to achieve carbon neutrality by 2050. Liberia is also developing a National Climate Change Policy and is implementing REDD+ readiness activities.

² Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT), viewed November 11, 2015: <http://faostat3.fao.org/browse/area/123/E>.

³ Environmental Protection Agency of Liberia, 2013. Initial National Communication, except where noted.