Greenhouse Gas Emissions in Ghana

Ghana Numbers at a Glance (2011)

59 $MtCO_2e$*
Total GHG emissions (0.13% of world total)
World: 46,906 $MtCO_2e$

24,820,706
Population
World: 6,964,618,177

2.37
tCO_2e per capita
World: 6.73 tCO_2e

US$17,027 Million
GDP**
World: US$54,034 Billion

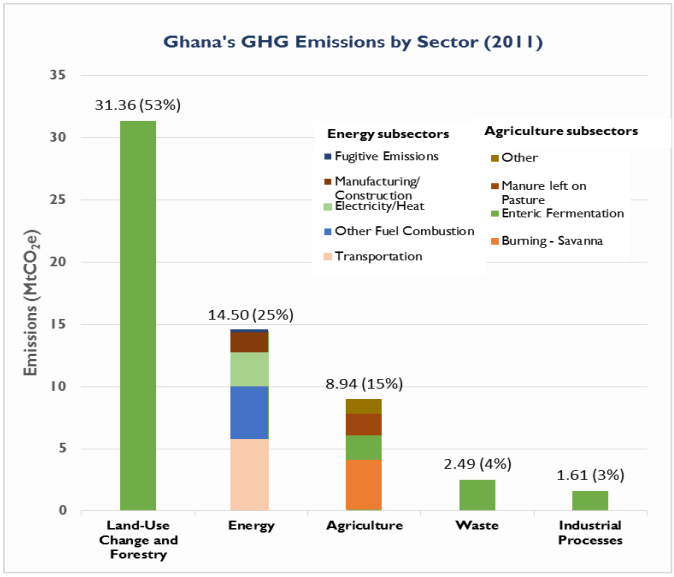
3,459
tCO_2e/million US$ GDP
World: 868 tCO_2e/million US$ GDP

+9.7 $MtCO_2e$ (+20%)
Change in GHG emissions (1990–2011)
World: +12,969 $MtCO_2e$

Sources: 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$

Greenhouse Gas (GHG) Emissions by Sector

According to the World Resources Institute Climate Analysis Indicator Tool (WRI CAIT), Ghana's GHG profile is dominated by emissions from the land-use change and forestry (LUCF) sector, 53% of Ghana's total emissions, which is driven by changes in forest land. Energy is the second largest emitter and contributes 25% of the total, of which 39% is due to transportation, 29% to other fuel combustion, and 19% to electricity and heat. Agriculture accounts for 15%, of which burning savanna is responsible for nearly half (45%).



Sources: WRI CAIT 2.0, 2015 and FAOSTAT, 2015

Change in GHG Emissions in Ghana (1990-2011)

Ghana's total GHG emissions grew 20% from 1990-2011. The average annual change during this period was 0.9%, with sector-specific average annual change as follows: LUCF (-0.7%), energy (6.4%), agriculture (1.9%), waste (6.8%), and IP (3.2%).[1]

LUCF: According to WRI CAIT, LUCF emissions decreased by 5.2 $MtCO_2e$, from 36.6 $MtCO_2e$ in 1990 to 31.4 $MtCO_2e$ in 2011. In contrast, Ghana's Third National Communication (TNC) to the UNFCCC notes an increase in GHG emissions from land, which rose from -3.0 $MtCO_2e$ to 1.3 $MtCO_2e$ during this time, largely due to deforestation.[2] Ghana's estimated annual deforestation rate of 2.2% from 2005 to 2010 was the sixth highest in the world,[3] although the TNC notes that Ghana's national reforestation plan led to decreased emissions from land-use change between 2010 and 2012.[4] According to the TNC and Ghana's REDD+ Readiness Preparation Proposal (R-PP), key drivers of increased deforestation include agricultural expansion; increased demand for wood and wood products for energy; population and development pressures; increased animal grazing; and mining and mineral exploitation.

Energy: According to WRI CAIT, energy emissions increased by 10.2 $MtCO_2e$ from 1990 to 2011, with transportation contributing the largest share (40%) of the increase. The TNC notes that the main drivers of transportation GHGs were the growing number of passenger vehicles and the expanding domestic aviation industry. The TNC also indicates a sizeable increase from the stationary energy sector, which is comprised mainly of electricity generation plants and

[1] World Resources Institute Climate Analysis Indicator Tool (WRI CAIT) 2.0, 2015.

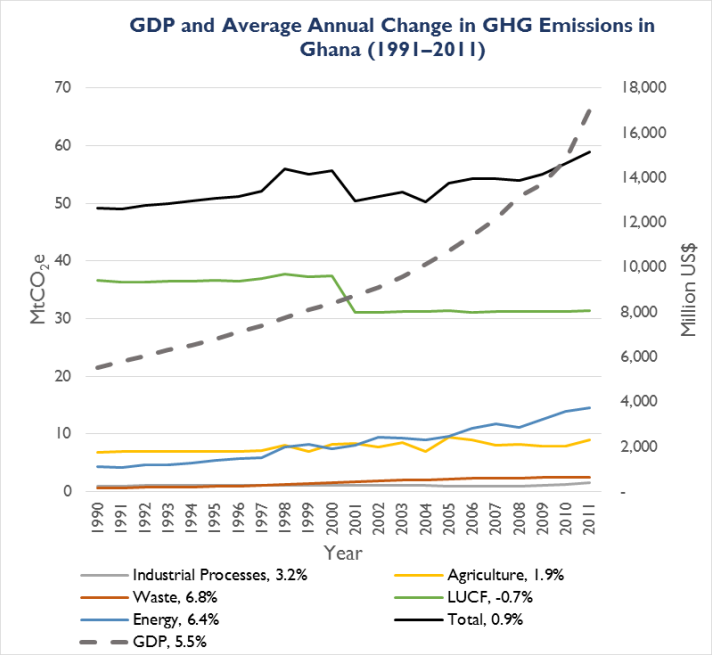
[2] Ghana's TNC and WRI CAIT use different data sources for the GHG inventory. Ghana's TNC inventory was prepared using a mix of data sources from national and international institutions, with priority given to data generated in the country. Emissions from land were based on data provided by the Forest Preservation Programme (2012) and expert judgement (Ghana. Ghana's TNC, 2015). WRI CAIT uses data from the Statistic Division of the Food and Agriculture Organization of the United Nations (FAOSTAT) for LUCF sector emissions (WRI, 2015).

[3] The Redd Desk, Ghana Readiness Overview, 2016: http://theredddesk.org/countries/ghana/

[4] Ghana. Ghana's Third National Communication Report to the UNFCCC, 2015: http://unfccc.int/resource/docs/natc/ghanc3.pdf.

industrial sources, predominantly mining and quarrying. Electricity consumption increased due to rising demand from electrified households, expanding commercial activities, and larger household incomes.[5] An increasing portion of Ghana's electricity also comes from emissions-intensive fossil fuels; the TNC states that the share of electricity generation from light crude oil, diesel, and natural gas increased from virtually zero in 1990 to 32.9% in 2012, as Ghana diversified its supply to meet rising demand and enhance energy security. This trend can be expected to continue; Ghana seeks to increase domestic natural gas production and natural gas imports, and is examining the potential for coal imports.[6]

Agriculture: According to WRI CAIT, agriculture emissions grew 32% from 1990-2011. Ghana's Biennial Update Report to the UNFCCC states that the rise in the number of livestock and frequent burning of biomass through land clearing contributed to the increase in emissions. Between 1999 and 2010, the livestock sector grew 177%.[7] Agriculture is a key sector of Ghana's economy, employing almost half of the national labor force. It has grown significantly since 2007 but remains largely rain-fed and subsistence-based, with rudimentary technology.[8]



Source: WRI CAIT 2.0, 2015

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

According to WRI CAIT, Ghana's GHG emissions grew 9.67 $MtCO_2e$ from 1990 to 2011, averaging 0.9% annually, while GDP grew by 209%, averaging 5.5% annually.[9] Ghana's TNC states that the energy intensity of the economy rose to meet growing demand in industry, transport and households. Overall, however, declining emissions in the LUCF sector partially mitigated this trend.[10] With the carbon intensity of Ghana's economy at almost 4 times the world average, there is potential to reduce Ghana's GHG emissions relative to GDP.

Climate Change Mitigation Targets and Plans

Ghana's Intended Nationally Determined Contribution (INDC) identifies emission reduction actions to be undertaken between 2020 and 2030 in the energy, transportation, agriculture, forestry and land use, waste, and industry sectors. Ghana aims to reduce GHG emissions 15% by 2030 compared to the Business as Usual (BAU) scenario through actions including a 20% improvement in energy efficiency of industrial facilities, replacement of light crude oil with natural gas in electricity generation plants, and the reforestation and afforestation of 10,000 hectares of degraded lands annually. The INDC notes that this target could be strengthened to 45% with international support by increasing renewable energy penetration, scaling up adoption of efficient cookstoves, expanding mass transportation in cities, and improving forest and solid waste management. The INDC is anchored in several long-term development strategies and policies, including the 2010 National Energy Policy, which aims to increase the proportion of renewable energy on the electric grid; and the 2015 National REDD+ Strategy, which proposes to focus on areas vulnerable to deforestation to improve wood harvesting practices, implement climate-smart agriculture, and implement policy and legislative reforms to clarify land tenure and regulate the timber and mining sectors.

[5] Ghana. Ghana's Third National Communication (TNC) Report to the UNFCCC, 2015: http://unfccc.int/resource/docs/natc/ghanc3.pdf.

[6] Ghana. National Energy Policy, 2010: https://s3.amazonaws.com/ndpc-static/pubication/Energy+Policy_Feb2010.pdf; TNC, 2015.

[7] Ghana Ministry of Food and Agriculture, 2010 Facts and Figures, 2011.

[8] Food and Agriculture Organization (FAO), Country fact sheet on food and agriculture policy trends, 2015: http://www.fao.org/3/a-i4490e.pdf.

[9] WRI CAIT 2.0, 2015.

[10] TNC, 2015.