Greenhouse Gas Emissions in Jamaica

Jamaica Numbers at a Glance (2013)

10.3 $MtCO_2e$*
Total GHG emissions (0.02% of world total)
World: 48,257 $MtCO_2e$

2,714,669
Population
World: 7,176,092,192

3.79
tCO_2e per capita
World: 6.72 tCO_2e

US$ 13,404 Million
GDP**
World: US$71,059 Billion

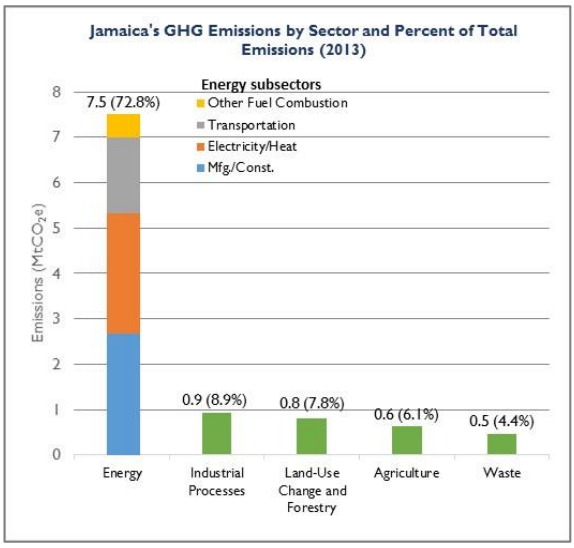
768.4
tCO_2e/million US$ GDP
World: 679 tCO_2e/million US$ GDP

+0.63 $MtCO_2e$ (+7%)
Change in GHG emissions (1990 - 2013)
World: +14,434 $MtCO_2e$ (+43%)

Sources: WRI CAIT 2.0, 2017. Emissions including Land-Use Change and Forestry
*Million metric tons of carbon dioxide equivalent. Global Warming Potentials are from the Intergovernmental Panel on Climate Change Second Assessment Report
**Gross Domestic Product (GDP) in constant 2010 US$

Greenhouse Gas (GHG) Emissions by Sector

According to the World Resources Institute Climate Analysis Indicators Tool (WRI CAIT), Jamaica's GHG emissions in 2013 were dominated by the energy sector (72.8%), with manufacturing and construction, electricity and heat generation contributing 71% of sector emissions.[1] Industrial processes were the second most significant source of emissions (8.9%), followed by land use change and forestry (LUCF) (7.8%), agriculture (6.1%), and waste (4.4%).[2]



Sources: WRI CAIT 2.0, 2017, FAOSTAT, 2017.

Jamaica's Biennial Update Report (BUR) to the UNFCCC, submitted in 2016, includes a GHG inventory for 2012 that also shows energy to have been the largest source of GHGs.[3] However, the BUR shows agriculture as the second highest source, and land use, land use change and forestry (LULUCF) as a carbon sink, absorbing 1.6 $MtCO_2e$ in 2012 and offsetting about 11% of gross emissions in 2012.[4]

Change in GHG Emissions in Jamaica (1990-2013)

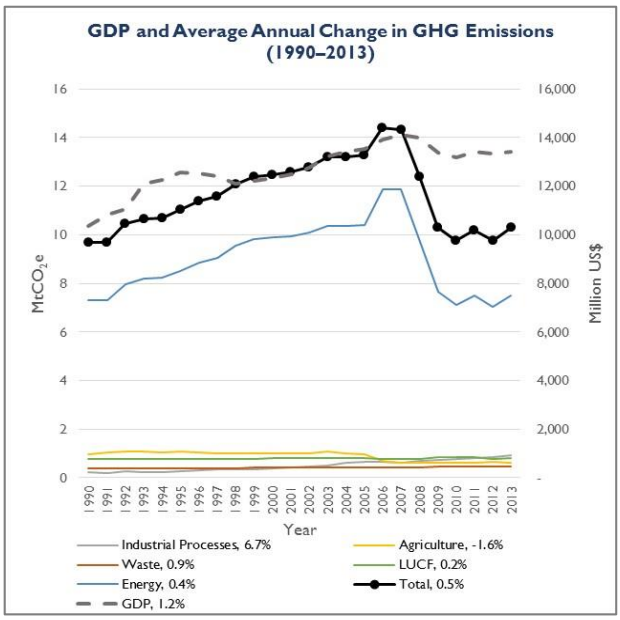
According to WRI CAIT, Jamaica's GHG emissions increased by 0.63 $MtCO_2e$ from 1990 to 2013, with total emissions peaking in 2006, following the trajectory of energy emissions. The average annual change in total emissions from 1990 to 2013 was 0.5%, with average annual change by sector as follows: energy (0.4%), IP (6.7%), LUCF (0.2%), agriculture (-1.6%), and waste (0.9%). The change in emissions in the two highest emitting sectors is discussed below.

Energy: According to WRI CAIT, energy sector emissions increased by 0.18 $MtCO_2e$ from 1990 to 2013, with electricity and heat production, and transportation driving this increase. Energy emissions from manufacturing and construction decreased 29% during this period.[5] Between 1990 and 2013, International Energy Agency (IEA) data show that industrial fuel consumption decreased 15%,[6] and total electricity generation increased 62%.[7] As of 2013, 90% of electricity was generated by fuel oil, followed by biofuels (4%), hydro (3%), and wind (3%).[8]

[1] World Resources Institute Climate Analysis Indicators Tool (WRI CAIT 2.0, 2017). Global Warming Potentials (GWPs) are from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR).
[2] WRI CAIT 2.0, 2017. WRI CAIT draws primarily on the International Energy Agency (IEA) data for energy emissions, the US Environment Protection Agency for IP and waste emissions, and Food and Agriculture Organization (FAO) data for LUCF and agriculture emissions. WRI notes that LUCF data is useful as a reference only and may not coincide with LUCF emissions reported by countries to the UNFCCC (WRI. CAIT Country Greenhouse Gas Emissions: Sources & Methods, 2015).
[3] Government of Jamaica. Jamaica's Biennial Update Report (BUR) to the UNFCCC, 2016. The BUR uses GWPs from the IPCC SAR to convert methane, nitrous oxide, and hydrofluorocarbon emissions to CO_2e. The BUR shows sector emissions totals by gas for 2012, from which this factsheet estimated emissions in $MtCO_2e$ to facilitate comparison with WRI CAIT figures: energy (8.5 $MtCO_2e$), agriculture (7.2 $MtCO_2e$), waste (0.7 $MtCO_2e$), IP (0.5 $MtCO_2e$), and LULUCF (-1.6 $MtCO_2e$); total GHGs were approximately 15.1 $MtCO_2e$ in 2012. The BUR assigned uncertainty values to activity data and emission factors and reports 3.5% uncertainty in carbon dioxide emissions from 2006-2012, 62% uncertainty in methane emissions, 34% uncertainty in nitrous oxide emissions, and 112% in hydrofluorocarbon emissions.
[4] Ibid. The BUR notes that LULUCF emissions are very high in uncertainty. A number of key assumptions and extrapolation were used to generate input data for the 2006-2012 period which is expected to have a significant impact on the quality of the input data.
[5] WRI CAIT 2.0, 2017.
[6] IEA. Jamaica Balances, 1990 and 2013.
[7] IEA. Jamaica Electricity and Heat 1990 and 2013.

The BUR notes that industrial fuel combustion, dominated by the mining/bauxite industry, showed very large year-to-year variations due to economic factors. In particular, the substantial decrease in emissions from 2008 to 2009 represents the impact of the global economic downturn on the industry sector.[9] In 2009, Jamaica developed its 2009-2030 National Energy Policy (NEP) to achieve a modern, efficient, diversified, and environmentally sustainable energy sector by 2030. As part of goal 1 of the policy, Jamaica plans to provide incentives for improving energy efficiency in power generation and bauxite/alumina production, and promote energy efficiency and conservation in transportation, and building design and construction. As part of goal 2, Jamaica plans to have a modernized energy infrastructure including energy efficient power plants and distribution systems. As part of goal 3, Jamaica plans to increase the use of renewables including solar, hydro, wind, and biofuels in the energy mix to 20% by 2030.

Industrial Processes: WRI CAIT data show that IP emissions increased by 0.69 $MtCO_2e$ from 1990 to 2013. As of 2013, Jamaica was the sixth largest producer of bauxite in the world (10 million tons per year) and the seventh largest alumina refinery (1970 kilo tons per year), accounting for 3.9% and 2.2% of world production, respectively.[10] The alumina industry in Jamaica includes four alumina refineries with their mining and port operations, as well as bauxite drying and shipping facilities.[11] Between 2001 and 2007 the mining industry's annual average growth was 3.2%, but this slowed significantly during 2009-2013 due to the global financial crisis which resulted in the closure of three of the country's four alumina plants in 2009.[12] At the end of 2013, two of the four alumina plants remained closed.[13] In 2014, Jamaica prepared its 2014-2030 National Minerals Policy (Draft) which puts forward strategies for the sustainable development of the country's minerals sector.



Source: WRI CAIT 2.0, 2017.

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

Jamaica's GHG emissions grew 7% from 1990 to 2013, averaging 0.5% annually, while GDP grew 30%, averaging 1.2% annually.[14] It is a positive trend for GDP to grow faster than GHG emissions, although as of 2013, Jamaica emitted more GHGs relative to GDP than the world average. The Jamaican economy is characterized by high energy intensity and low efficiency.[15] As part of its Vision 2030 National Development Strategy, Jamaica plans to reduce its dependence on fossil fuels and contribute to the development of a green economy.

Climate Change Mitigation Targets and Plans

In 2015, Jamaica adopted a Climate Change Policy Framework intended to support the Vision 2030, mainstream climate change into sectoral and financial planning, and build the capacity of sectoral institutions to develop and implement their own climate change adaptation and mitigation plans. In its Intended Nationally Determined Contribution (INDC), submitted to the UNFCCC in 2015, Jamaica commits to unconditionally mitigate the equivalent of 1.1 $MtCO_2e$ per year by 2030 (equivalent to a reduction of 7.8% of emissions) compared to the 2030 business as usual scenario. The target is based on the current level of implementation of the NEP, and the current pipeline of renewable energy projects. The INDC also states that the 2030 target could be strengthened to reduce emissions by10% below 2030 BAU levels, subject to the provision of international support to enhance the NEP implementation. In particular, Jamaica seeks support for the expansion of energy efficiency initiatives in the electricity and transportation sectors, in line with sector action plans and policies that are being developed.[16] Jamaica has signed and ratified the Paris Agreement.[17]

[9] Government of Jamaica, BUR, 2016.
[10] Ministry of Science, Technology, Energy and Mining. The National Minerals Policy, Fostering Sustainability in Jamaica's Minerals Industry, 2014. Bauxite is the primary ore of aluminum, from which almost all aluminum is extracted (Geology.com, Bauxite, viewed on March 30, 2017). Alumina is also called aluminum oxide.
[11] National Environment and Planning Agency. Jamaica State of the Environment Report, 2010.
[12] Ministry of Science, Technology, Energy and Mining. The National Minerals Policy – Fostering Sustainability in Jamaica's Minerals Industry, 2014.
[13] Ibid.
[14] WRI CAIT 2.0, 2017.
[15] The Ministry of Energy and Mining. Jamaica's National Energy Policy 2009-2013, 2009.
[16] Government of Jamaica. Jamaica's Intended Nationally Determined Contribution (INDC) to the UNFCCC, 2015.
[17] UNFCCC, Paris Agreement – Status of Ratification, viewed on April 18, 2017.