ENERGY HUB FOR LATIN AMERICA AND THE CARIBBEAN

Evolution of greenhouse gas emissions from the energy sector in LAC

Metadata for the database

April 2023

Energy Hub for Latin America and the Caribbean
https://hubenergia.org/en

Inter-American Development Bank
1300 New York Avenue, N.W.
Washington, D.C. 20577, USA

1 CONTACT

1.1 CONTACT ORGANIZATION

Energy HUB for Latin America and the Caribbean.

1.2 CONTACT ORGANIZATION UNIT

Inter-American Development Bank (INE/ENE). 1300 New York Avenue, N.W. Washington, D.C. 20577, USA.

1.3 CONTACT EMAIL ADDRESS

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2 METADATA UPDATE

2.1 METADATA LAST UPDATE

April 19, 2023.

3 GREENHOUSE GAS EMISSIONS BY THE ENERGY SECTOR AND SUBSECTOR

3.1 INDICATOR

Greenhouse gas emissions by the energy sector and subsector.

3.2 LONG DEFINITION

Greenhouse gas emissions by the energy sector and subsector present information on greenhouse gas (GHG) emissions: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and F-gases (hydrofluorocarbons (HFCs); perfluorocarbons (PFCs), and sulfur hexafluoride (SF6)), generated through activities in the following sectors: agriculture, energy, industrial processes, land use change and forestry, waste. The energy sector is divided into the following subsectors:

electricity/heat, fugitive emissions, manufacturing/construction, other combustion, and transportation.

3.3 SOURCE

Elaboration of the Energy Hub, with data from CAIT in Climate Watch:

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

3.4 UNIT OF MEASURE

Million tons of carbon dioxide equivalent (MtCO2e)

3.5 PERIODICITY

Annual. Data from 1990 to 2019.

3.6 GEOGRAPHIC COVERAGE

National and regional coverage.

Countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Regions: Latin America and the Caribbean, World, European Union.

3.7 STATISTICAL CONCEPT AND METHODOLOGY

3.7.1 Agriculture

The agriculture sector includes CH4 and N2O emissions statistics, expressed in CO2 equivalents. Total agricultural emissions, obtained from FAOSTAT, include the following sub-domains: Enteric fermentation, Manure management, Rice cultivation, Synthetic fertilizers (N_2O), Manure applied to soils, Manure deposited on pastures, Agricultural residues, Organic soil cultivation,

Combustion - Agricultural residues (CH_4, N_2O), and Combustion - Savanna (CH_4, N_2O).

3.7.2 Energy

The energy sector considers emissions generated by the generation and consumption of energy from 65 sub-sectors: electricity/heat, fugitive emissions, manufacturing/construction, transportation, other combustion, and. Most energy emissions come from CO2 emissions from burning fossil fuels. However, CH4 and N2O emissions can also be significant, particularly in the fugitive emissions subsector (CH4). The CO2 emissions information comes mainly from IEA estimates, while CH4 and N2O emissions are derived from EPA estimates.

3.7.2.1 Electricity/heat

This subsector refers mainly, but not exclusively, to electricity and heat (including cogeneration) produced by entities whose main activity is to supply the public. Here, this category also includes auto producers and other energy industries. Auto producers generate electricity, in whole or in part, for their own use as an activity that supports their main activity. They may be privately or publicly owned. Other energy industries refer to emissions from fuels burned in petroleum refineries, for the manufacture of solid fuels, coal mining, oil and gas extraction, and other energy-producing industries (IEA, 2014).

3.7.2.2 Fugitive emissions

The fugitive emissions sub-sector includes the following emissions:

- CO2 from natural gas flaring / venting.

- CH4 from oil and natural gas systems.

- CH4 from coal mining.

- CH4 and N2O from other energy sources (natural gas and oil fugitives, and solid fuels).

Gas flaring refers to the practice of flaring gas released in association with oil production.

3.7.2.3 Manufacturing/Construction

The manufacturing and construction subsector contains emissions from the combustion of fuels from industries and construction and includes CO2 emissions.

3.7.2.4 Transportation

The transport subsector includes CO2 emissions from the following activities: domestic aviation (commercial, private, agricultural, military, etc.), road transport, rail, domestic shipping, unspecified transport, and non-energy use in transport. Transportation contains emissions from fuel combustion for all transportation activity, regardless of sector.

3.7.2.5 Other combustion

Other combustion sub-sector includes the following emissions.

- CH4 and N2O from biomass combustion

- CH4 and N2O from stationary and mobile sources

- CO2 from other sectors

3.7.3 Industrial processes

Industrial process emissions statistics include CO2 emissions from cement production, derived from CDIAC; N2O emissions from adipic and nitric acid production; N2O and CH4 emissions from other (non-agricultural) industries; and emissions of fluorinated gases (HFCs, PFCs, and SF6) are derived from EPA.

3.7.4 Land use change and forestry

The land use change and forestry sector contain all emissions and removals of each of the relevant greenhouse gases (CO2, CH4, N2O), expressed in CO2 equivalents, aggregated for the following subdomains: Forest Land (CO2, CH4, N2O), Cropland (CO2), Grassland (CO2) and Biomass Combustion (CO2, CH4, N2O), derived from FAOSTAT.

3.7.5 Waste

Waste CH4 and N2O emissions statistics are from EPA and include the following activities:

landfills (solid waste), wastewater treatment, human waste, and other wastes.

For more information, visit: http://cait.wri.org/docs/CAIT2.0_CountryGHG_Methods.pdf

3.8 Limitations and exceptions

Greenhouse gas emissions data varies in availability across years, countries, and regions.

3.9 General comments

The data in this section are used for the Energy Hub visualization, the evolution of greenhouse gas emissions from the energy sector in LAC.

3.10 Download source URL

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

3.11 Visualization and Dataset URL

https://hubenergia.org/es/indicators/evolucion-de-las-emisiones-de-gases-de-efecto-invernadero-de-energia-en-alc

4 Greenhouse gas emissions by sector (%)

4.1 Indicator

Greenhouse gas emissions by sector (%).

4.2 Long definition

This indicator presents the percentage of emissions for each of the sectors.

4.3 Source

Elaboration of the Energy Hub, with data from CAIT in Climate watch:

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

4.4 Unit of measure

Percentage (%).

4.5 Periodicity

Annual. Data from 1990 to 2019.

4.6 Geographic coverage

National and regional coverage.

Countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Regions: Latin America and the Caribbean, World, European Union.

4.7 Statistical concept and methodology

For these indicators, greenhouse gas emissions for each of the sectors are divided by the total excluding changes in land use and forestry and by the total including changes in land use and forestry.

4.8 Limitations and exceptions

Data vary in availability by year, country, and region.

4.9 General comments

The data in this section are used for the Energy Hub visualization, the evolution of greenhouse gas emissions from the energy sector in LAC.

4.10 Download source URL

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

4.11 Visualization and Dataset URL

https://hubenergia.org/es/indicators/evolucion-de-las-emisiones-de-gases-de-efecto-invernadero-de-energia-en-alc

5 Greenhouse gas emissions by energy sub-sector (%)

5.1 Indicator

Greenhouse gas emissions by energy sub-sector (%).

5.2 Long definition

This indicator presents the percentage of emissions for each of the subsectors.

5.3 Source

Elaboration of the Energy Hub, with data from CAIT in Climate watch:

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

5.4 Unit of measure

Percentage (%).

5.5 Periodicity

Annual. Data from 1990 to 2019.

5.6 Geographic coverage

National and regional coverage.

Countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Regions: Latin America and the Caribbean, World, European Union.

5.7 Statistical concept and methodology

For these indicators, greenhouse gas emissions for each of the sectors are divided by the total excluding changes in land use and forestry and by the total including changes in land use and forestry.

5.8 Limitations and exceptions

Data vary in availability by year, country, and region.

5.9 General comments

The data in this section are used for the Energy Hub visualization, the evolution of greenhouse gas emissions from the energy sector in LAC.

5.10 Download source URL

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

5.11 Visualization and Dataset URL

https://hubenergia.org/es/indicators/evolucion-de-las-emisiones-de-gases-de-efecto-invernadero-de-energia-en-alc

6 Greenhouse gas emissions from the energy sub-sector

6.1 Indicator

Greenhouse gas emissions from the energy sub-sector.

6.2 Long definition

This indicator presents the number of emissions for each of the energy subsectors.

6.3 Source

Elaboration of the Energy Hub, with data from CAIT in Climate watch:

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

6.4 Unit of measure

Million tons of carbon dioxide equivalent (MtCO2e).

6.5 Periodicity

Annual. Data from 1990 to 2019.

6.6 Geographic coverage

National and regional coverage.

Countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Regions: Latin America and the Caribbean, World, European Union.

6.7 Statistical concept and methodology

The energy sector is divided into the following sub-sectors: electricity/heat, fugitive emissions, manufacturing/construction, other combustion, and transportation.

For more information, please visit: http://cait.wri.org/docs/CAIT2.0_CountryGHG_Methods.pdf.

6.8 Limitations and exceptions

Data vary in availability by year, country, and region.

6.9 General comments

The data in this section are used for the Energy Hub visualization, the evolution of greenhouse gas emissions from the energy sector in LAC.

6.10 Download source URL

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

6.11 Visualization and Dataset URL

https://hubenergia.org/es/indicators/evolucion-de-las-emisiones-de-gases-de-efecto-invernadero-de-energia-en-alc

7 Greenhouse gas emissions intensity per GDP

7.1 Indicator

Greenhouse gas emissions intensity per GDP.

7.2 Long definition

This indicator shows the amount of greenhouse gas emissions per amount of countries GDP.

7.3 Source

Elaboration of the Energy Hub, with data from CAIT in Climate watch:

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990 and World Bank: https://data.worldbank.org/

7.4 Unit of measure

TCO_2e/US$ 1000 of GDP.

7.5 Periodicity

Annual. Data from 1990 to 2019.

7.6 Geographic coverage

National and regional coverage.

Countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Regions: Latin America and the Caribbean, World, European Union.

7.7 Statistical concept and methodology

The following formula was used to calculate the indicator:

$$GEI\ intensity\ per\ GDP = \left(\frac{Emissions\ of\ greenhouse\ gases}{GDP(constant\ 2015\ US\$)}\right) X\ 1000000000$$

7.8 Limitations and exceptions

Data vary in availability by year, country, and region.

7.9 General comments

The data in this section are used for the Energy Hub visualization, the evolution of greenhouse gas emissions from the energy sector in LAC.

7.10 Download source URL

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

7.11 Visualization and Dataset URL

https://hubenergia.org/es/indicators/evolucion-de-las-emisiones-de-gases-de-efecto-invernadero-de-energia-en-alc

8 GREENHOUSE GAS EMISSIONS PER CAPITA

8.1 INDICATOR

Greenhouse gas emissions per capita.

8.2 LONG DEFINITION

This indicator shows the amount of greenhouse gas emissions per capita.

8.3 SOURCE

Elaboration of the Energy Hub, with data from CAIT in Climate Watch:

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990 and World Bank: https://data.worldbank.org/

8.4 UNIT OF MEASURE

TCO_2e per capita.

8.5 PERIODICITY

Annual. Data from 1990 to 2019.

8.6 GEOGRAPHIC COVERAGE

National and regional coverage.

Countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Regions: Latin America and the Caribbean, World, European Union.

8.7 STATISTICAL CONCEPT AND METHODOLOGY

The following formula was used to calculate the indicator:

$$GEI\ intensity\ per\ capita = \left(\frac{Emissions\ of\ greenhouse\ gases}{Population\ (2022)}\right) X\ 1000000$$

8.8 LIMITATIONS AND EXCEPTIONS

Data vary in availability by year, country, and region.

8.9 GENERAL COMMENTS

The data in this section are used for the Energy Hub visualization, the evolution of greenhouse gas emissions from the energy sector in LAC.

8.10 DOWNLOAD SOURCE URL

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

8.11 VISUALIZATION AND DATASET URL

https://hubenergia.org/es/indicators/evolucion-de-las-emisiones-de-gases-de-efecto-invernadero-de-energia-en-alc

9 GREENHOUSE GAS EMISSIONS BY ENERGY CONSUMPTION

9.1 INDICATOR

Greenhouse gas emissions by energy consumption.

9.2 LONG DEFINITION

This indicator shows the amount of greenhouse gas emissions by energy consumption.

9.3 SOURCE

Elaboration of the Energy Hub, with data from Olade Sielac: https://sielac.olade.org/

CAIT in Climate watch:

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990 and World Bank: https://data.worldbank.org/

9.4 UNIT OF MEASURE

TCO_2e/bep.

9.5 PERIODICITY

Annual. Data from 1990 to 2019.

9.6 GEOGRAPHIC COVERAGE

National and regional coverage.

Countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Regions: Latin America and the Caribbean, World, European Union.

9.7 STATISTICAL CONCEPT AND METHODOLOGY

The following formula was used to calculate the indicator:

$$GEI\ intensity\ by\ energy\ consumption = \left(\frac{Emissions\ of\ greenhouse\ gases}{Energy\ consumption}\right) X\ 1000$$

9.8 Limitations and exceptions

Data vary in availability by year, country, and region.

9.9 General comments

The data in this section are used for the Energy Hub visualization, the evolution of greenhouse gas emissions from the energy sector in LAC.

9.10 Download source URL

https://sielac.olade.org/

https://www.climatewatchdata.org/ghg-emissions?end_year=2019&start_year=1990

9.11 Visualization and Dataset URL

https://hubenergia.org/es/indicators/evolucion-de-las-emisiones-de-gases-de-efecto-invernadero-de-energia-en-alc