

Carbon dioxide (CO2) emissions excluding LULUCF per capita (t CO2e/capita)

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Metadata producers

Name	Abbreviation	Affiliation
Development Economics Data Group	DECDG	World Bank

Version

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Version notes

Updated metadata ID for consistency with indicator code.

Version date

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Indicator description

Title statement

Indicator code

WB_WDI_EN_GHG_CO2_PC_CE_AR5

Indicator name

Carbon dioxide (CO2) emissions excluding LULUCF per capita (t CO2e/capita)

Alternate identifiers

Type	Identifier	Database	Notes
DCS code	EN.GHG.CO2.PC.CE.AR5	DCS	Identifier in DCS database

Database ID

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Database name

World Development Indicators (WDI)

Language

Name	Code
English	EN

Version date

2026-07-01

Description

Definition

Total annual emissions of carbon dioxide (CO₂), one of the six Kyoto greenhouse gases (GHG), from the agriculture, energy, waste, and industrial sectors, excluding LULUCF, standardized to carbon dioxide equivalent values divided by the economy's population. This measure excludes GHG fluxes caused by Land Use, Land-Use Change and Forestry (LULUCF), as these fluxes have larger uncertainties.

Development relevance

Anthropogenic (human-caused) emissions of global greenhouse gases, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and F-gases, lead to an increase of the concentration of greenhouse gases in the atmosphere, which in turn causes atmospheric warming by trapping heat in the atmosphere (greenhouse gas effect). Atmospheric warming leads to climatic changes causing more frequent and extreme weather events and higher temperatures globally, leading to large impacts across the globe and particularly in developing countries that often have a limited means to adapt and build resilience. The international scientific community has warned that emissions need to decline to net zero by the middle of the 21st century to limit global warming to well below a 2deg C increase and help avoid the most consequential climate change impacts.

Climate change is having a disproportionate impact on developing countries and if unabated will not only reverse past development progress and hinder poverty reduction but will also make future development more costly. Country level assessments of the potential climate change impacts on specific developing countries, performed as part of the World Bank's Country Climate and Development Reports (CCDRs), show that climate change will have a significant impact on developing countries' economies, ranging from about 0.5% of GDP for higher income developing countries to over 13% for the lowest income developing countries. The costs of partial adaptation to these changes will be significant as well -- ranging between 1 and 10% of developing countries' GDP.

Measurement unit

t CO₂e/capita

Dimensions

Label	Description
Year	
Geographic area	Country/economy, country group, region

Periodicity

Annual

Topics

Vocabulary
WDI topics

Links

Type	Description	URL
WDI API	Data in JSON	https://api.worldbank.org/v2/countries/all/indicators/en.ghg.co2.pc.ce.ar5?date=1970:2022&format=json
WDI API	Data in XML	https://api.worldbank.org/v2/countries/all/indicators/en.ghg.co2.pc.ce.ar5?date=1970:2022
WDI API	Metadata in JSON	https://api.worldbank.org/v2/sources/2/series/en.ghg.co2.pc.ce.ar5/metadata?format=json
WDI API	Metadata in XML	https://api.worldbank.org/v2/sources/2/series/en.ghg.co2.pc.ce.ar5/metadata

Quality

Limitations

Global GHG emissions are currently not directly measurable, but approaches for their estimation exist, and numerous sources exist to supply data for this indicator. Reputable scientific organizations produce these data for use for research, policy analysis, climate negotiations, and broader public communications. The estimated accuracy from fossil fuel combustion and industrial processes are quite high, as quantities of fossil fuels and other emissive materials (such as cement and steel) produced are well known. For these sectors, emissions estimates are roughly accurate to within 10% when aggregated to the global level and between 4% and 35% at the country level (Crippa et al., 2023). For non-combustion and non-industrial process emissions, the accuracy is lower. Agricultural emissions, for example, depend upon many factors including the type of crops grown and livestock raised, specific agricultural practices, and other climate and non-climate factors. For these emissions, the accuracy is lower—around 30% for CH₄ and fluorinated gases (HFCs, PFCs, and SF₆).

Concepts and methods

Methodology

EDGAR compiles data from multiple authoritative sources, including: International Energy Agency (IEA) – Energy consumption data, United Nations Framework Convention on Climate Change (UNFCCC) – National GHG inventories, Food and Agriculture Organization (FAO) – Agricultural emissions, World Bank & National Statistics Offices – Socioeconomic and industrial data, Scientific Literature & IPCC Guidelines – Emission factors and methodologies.

EDGAR follows the IPCC (Intergovernmental Panel on Climate Change) Guidelines for National Greenhouse Gas Inventories to estimate emissions. The core equation is:

$$E = A \times EF$$

Where:

E = Total emissions (kg, tons, or CO₂-equivalent)

A = Activity data (e.g., fuel consumption, production levels)

EF = Emission factor (kg of pollutant per unit of activity)

Depending on the pollutant, different tiers of complexity are used:

Tier 1 – Default IPCC emission factors (simple estimation)

Tier 2 – Country/region-specific emission factors

Tier 3 – Detailed process-based models (highest accuracy)

Aggregation method

Weighted average using population as weights

Geographic and time coverage

Time coverage

Start	End
1970	2024

Economies

Name	Code
Aruba	ABW
Afghanistan	AFG
Albania	ALB
Angola	AGO
Argentina	ARG
American Samoa	ASM
United Arab Emirates	ARE
Armenia	ARM
Antigua and Barbuda	ATG
Australia	AUS
Austria	AUT
Azerbaijan	AZE
Belgium	BEL
Burundi	BDI
Benin	BEN
Bulgaria	BGR
Bangladesh	BGD
Bahamas, The	BHS
Bosnia and Herzegovina	BIH
Belarus	BLR
Bahrain	BHR
Belize	BLZ
Bermuda	BMU
Burkina Faso	BFA
Barbados	BRB
Bolivia	BOL
Brazil	BRA
Brunei Darussalam	BRN
Botswana	BWA
Bhutan	BTN
Central African Republic	CAF
Canada	CAN
Chile	CHL
Switzerland	CHE
China	CHN
Congo, Dem. Rep.	COD

Congo, Rep.	COG
Comoros	COM
Cabo Verde	CPV
Colombia	COL
Cayman Islands	CYM
Côte d'Ivoire	CIV
Czechia	CZE
Cyprus	CYP
Cameroon	CMR
Denmark	DNK
Dominica	DMA
Costa Rica	CRI
Germany	DEU
Dominican Republic	DOM
Cuba	CUB
Ecuador	ECU
Spain	ESP
Egypt, Arab Rep.	EGY
Algeria	DZA
Djibouti	DJI
Estonia	EST
Ethiopia	ETH
France	FRA
Micronesia, Fed. Sts.	FSM
Eritrea	ERI
Georgia	GEO
Gabon	GAB
Ghana	GHA
Faroe Islands	FRO
Gibraltar	GIB
Finland	FIN
Equatorial Guinea	GNQ
Guinea	GIN
Greece	GRC
Gambia, The	GMB
Guinea-Bissau	GNB
Guatemala	GTM
Fiji	FJI
United Kingdom	GBR
Greenland	GRL
Hong Kong SAR, China	HKG
Guyana	GUY

Guam	GUM
Honduras	HND
Croatia	HRV
Grenada	GRD
Haiti	HTI
Hungary	HUN
Indonesia	IDN
Ireland	IRL
Iraq	IRQ
Iran, Islamic Rep.	IRN
Italy	ITA
India	IND
Jamaica	JAM
Jordan	JOR
Japan	JPN
Israel	ISR
Kazakhstan	KAZ
Kenya	KEN
Kyrgyz Republic	KGZ
Cambodia	KHM
Lao PDR	LAO
St. Kitts and Nevis	KNA
Korea, Rep.	KOR
Kuwait	KWT
Iceland	ISL
Lebanon	LBN
Liberia	LBR
St. Lucia	LCA
Sri Lanka	LKA
Luxembourg	LUX
Kiribati	KIR
Lesotho	LSO
Lithuania	LTU
Latvia	LVA
Moldova	MDA
Macao SAR, China	MAC
Libya	LBY
Morocco	MAR
Mexico	MEX
Madagascar	MDG
Myanmar	MMR
Mali	MLI

Malta	MLT
Mauritania	MRT
Malawi	MWI
Northern Mariana Islands	MNP
Malaysia	MYS
Mauritius	MUS
Mozambique	MOZ
Maldives	MDV
Marshall Islands	MHL
Niger	NER
Nigeria	NGA
North Macedonia	MKD
Namibia	NAM
Norway	NOR
Nepal	NPL
Nicaragua	NIC
New Caledonia	NCL
Mongolia	MNG
Oman	OMN
Panama	PAN
Netherlands	NLD
New Zealand	NZL
Nauru	NRU
Pakistan	PAK
Palau	PLW
Papua New Guinea	PNG
Puerto Rico	PRI
Romania	ROU
Korea, Dem. People's Rep.	PRK
French Polynesia	PYF
Paraguay	PRY
Senegal	SEN
Qatar	QAT
Philippines	PHL
Russian Federation	RUS
Peru	PER
Saudi Arabia	SAU
Sudan	SDN
Poland	POL
Portugal	PRT
Sierra Leone	SLE
Singapore	SGP

El Salvador	SLV
Somalia, Federal Republic of	SOM
Sweden	SWE
Rwanda	RWA
Slovenia	SVN
Seychelles	SYC
São Tomé and Príncipe	STP
Slovak Republic	SVK
Turks and Caicos Islands	TCA
Suriname	SUR
Solomon Islands	SLB
Syrian Arab Republic	SYR
Thailand	THA
Tajikistan	TJK
Chad	TCD
Togo	TGO
Timor-Leste	TLS
Turkmenistan	TKM
Eswatini	SWZ
Trinidad and Tobago	TTO
Tanzania	TZA
Tunisia	TUN
Uganda	UGA
Türkiye	TUR
Tuvalu	TUV
Ukraine	UKR
Venezuela, RB	VEN
Uruguay	URY
United States	USA
British Virgin Islands	VGB
Samoa	WSM
Uzbekistan	UZB
Virgin Islands (U.S.)	VIR
Zambia	ZMB
Yemen, Rep.	YEM
Vietnam	VNM
Vanuatu	VUT
Zimbabwe	ZWE
Tonga	TON
St. Vincent and the Grenadines	VCT
South Africa	ZAF

Geographic areas

Name	Code
Africa Eastern and Southern	AFE
Africa Western and Central	AFW
Arab World	ARB
Central Europe and the Baltics	CEB
Caribbean small states	CSS
East Asia & Pacific (excluding high income)	EAP
East Asia & Pacific	EAS
Early-demographic dividend	EAR
Fragile and conflict affected situations	FCS
European Union	EUU
Europe & Central Asia (excluding high income)	ECA
Europe & Central Asia	ECS
Euro area	EMU
High income	HIC
Heavily indebted poor countries (HIPC)	HPC
IDA total	IDA
IDA & IBRD total	IBT
IDA blend	IDB
IBRD only	IBD
IDA only	IDX
Latin America & Caribbean (excluding high income)	LAC
Least developed countries: UN classification	LDC
Latin America & Caribbean	LCN
Low income	LIC
Low & middle income	LMY
Lower middle income	LMC
Late-demographic dividend	LTE
Middle income	MIC
Middle East, North Africa, Afghanistan & Pakistan (excluding high income)	MNA
Middle East, North Africa, Afghanistan & Pakistan	MEA
North America	NAC
Other small states	OSS
OECD members	OED
Pre-demographic dividend	PRE
Post-demographic dividend	PST
Pacific island small states	PSS
South Asia	SAS
Sub-Saharan Africa (excluding high income)	SSA
Sub-Saharan Africa	SSF
Small states	SST

East Asia & Pacific (IDA & IBRD)	TEA
Europe & Central Asia (IDA & IBRD)	TEC
Middle East, North Africa, Afghanistan & Pakistan (IDA & IBRD)	TMN
Latin America & Caribbean (IDA & IBRD)	TLA
Upper middle income	UMC
World	WLD
South Asia (IDA & IBRD)	TSA
Sub-Saharan Africa (IDA & IBRD)	TSS

Access and use

License

Name	URL
CC BY-4.0	https://creativecommons.org/licenses/by/4.0/

Confidentiality status

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API documentation

Description	URL
Developer Information webpage (detailed documentation of the WDI API)	https://datahelpdesk.worldbank.org/knowledgebase/topics/125589-developer-information

Sources and citation

Authoring entity

Name	Affiliation	Abbreviation	URL
World Bank Development Data Group	World Bank	WB	https://wdi.worldbank.org

Sources of data

Sources of data

Title

EDGAR (Emissions Database for Global Atmospheric Research) Community GHG Database

Author (Organization)

Joint Research Centre (JRC) - European Commission

Publisher

JRC European Commission

Date of publication

2024

Electronic location or identifier

https://edgar.jrc.ec.europa.eu/dataset_ghg2024

Sources of data

Author (Organization)

International Energy Agency (IEA)

Publisher

JRC European Commission

Date of publication

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Electronic location or identifier

https://edgar.jrc.ec.europa.eu/dataset_ghg2024