

Manual for the EEA greenhouse gas data viewer

This manual provides details on the scope, content and features of the [EEA GHG data viewer](#).

This viewer is a user-friendly tool which allows visualising and downloading greenhouse gas emission data and graphs related to EEA countries, for the period 1990-2014.

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Scope of the viewer

1.1 Which greenhouse gases are represented?

The table below lists the six main greenhouse gases (GHG) reported in the viewer. These are the gases against which emission reduction targets were agreed under the Kyoto Protocol. Global warming factors are applied to each gas in order to present the emissions in terms of CO₂ equivalent. For example: 1 kg of N₂O is equivalent to 298 kg of CO₂ in terms of global warming effect.

Greenhouse gas (GHG)	Global warming potential (GWP)
CO ₂	1
CH ₄	25
N ₂ O	298
SF ₆	22800
HFCs	reported in CO ₂ equivalent
PFCs	reported in CO ₂ equivalent
NF ₃	17200
Unspecified mix of HFCs and PFCs	reported in CO ₂ equivalent

Source: Climate Change 2007: Working Group I: The Physical Science Basis;
https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html .

Fluorinated gases (CO₂ equ.) = (SF₆) + (HFCs) + (PFCs) + (NF₃) + unspecified mix of HFCs and PFCs

All greenhouse gases - (CO₂ equ.) = (CO₂) + (25 * CH₄) + (298 * N₂O) + (22800*SF₆) + (HFCs) + (PFCs) + (17200*NF₃) + unspecified mix of HFCs and PFCs

1.2 Which countries and geographic entities are covered?

Data are available for each Member State of the European Union (EU-28), including EU-28 as Party to UNFCCC (EUA), and the EU-28 + Iceland, as Party to the Kyoto Protocol (EUC).

Additional information:

- “UK (Convention)” covers the territory of the United Kingdom, including Gibraltar, and excluding Overseas Territories and Crown Dependencies. This scope is consistent with EU domestic targets (e.g. Effort Sharing Decision) and the EU submission under the UNFCCC.
- “UK (KP)” covers the territory of the United Kingdom, including Gibraltar, and the Overseas Territories and Crown Dependencies which have ratified the Kyoto Protocol. This scope is consistent with the UK’s submissions under the UNFCCC and the Kyoto Protocol, and with the EU’s submissions under the Kyoto Protocol (which also includes Iceland).
- “EU28 (Convention)” covers strictly the EU territory and includes in particular the inventory data reported under “UK (Convention)”. This scope is consistent with the EU’s submission under the UNFCCC (EUA).
- “EU (KP)” covers the EU territory as well as Iceland and the United Kingdom’s Overseas Territories and Crown Dependencies which have ratified the Kyoto Protocol. This scope is consistent with the EU’s joint submission (with Iceland) under the Kyoto Protocol (EUC).

1.3 Which GHG-emitting sectors and sinks and sub-sectors are covered?

The data viewer presents data aggregated by sector (sources and sinks of GHG emissions). These sectors are fully consistent with the common reporting format (CRF) set in the guidelines developed by the [Intergovernmental panel on climate change \(IPCC\)](#).

Data are presented for all CRF sectors, described in the table below.

Sectors		Description of activities included
1	Energy	This category includes all GHG emissions arising from combustion and fugitive releases of fuels. Emissions from the non-energy uses of fuels are generally not included here, but reported under Industrial Processes and Product Use Sector.
2	Industrial processes and product use	Emissions from industrial processes and product use, excluding those related to energy combustion (reported under 1A), extraction, processing and transport of fuels (reported under 1B) and CO ₂ transport, injection and storage (reported under 1C).
3	Agriculture	All anthropogenic emissions from agriculture, except for fuel combustion emissions and sewage emissions, which are covered in Energy and Waste modules.
4	LULUCF (land use, land use change and forestry)	Total emissions and removals from activities relating to land use, land-use change and forestry.
5	Waste	Total GHG emissions from solid waste disposal, biological treatment of solid waste, incineration and open burning of waste and wastewater treatment and discharge.
6	Other sector	Emissions that do not fit under any other emission source/sink categories of the main categories described above.
7	International aviation and navigation (Memo)	Emissions resulting from fuel use in ships or aircraft engaged in international transport.
8	CO ₂ Emissions (Memo) from Biomass	CO ₂ emissions from combustion of biomass fuels are not included in totals for the energy sector.
9	Multilateral Operations (Memo)	Emissions from fuels used for aviation and waterborne navigation in multilateral operations pursuant to the Charter of the United Nations.
10	Indirect CO ₂	Indirect CO ₂ emissions from the atmospheric oxidation of CH ₄ , CO and NMVOCs.

1.4 How are total emissions calculated?

It is possible to present national total greenhouse gas emissions in four different ways:

- **Total net emissions (sector 1-6, including LULUCF, excluding indirect CO₂)** which takes into account emission removals by carbon sinks.

Total emissions (sector 1-6, including LULUCF, excluding indirect CO₂) =
 [1. Energy] + [2. Industrial Processes and product use] + [3. Agriculture] + [4. LULUCF (land use, land use change and forestry)] + [5. Waste] + [6. Other]

- **Total net emissions (sectors 1-6, including 4. LULUCF, including indirect CO₂)**, which takes into account emission removals by carbon sinks as well as indirect CO₂ emissions.

Total emissions (sectors 1-6, including 4. LULUCF, including indirect CO₂) =
 [1. Energy] + [2. Industrial Processes and product use] + [3. Agriculture] + [4. LULUCF (land use, land use change and forestry)] + [5. Waste] + [6. Other] + [indirect CO₂]

- **Total emissions (sector 1-6, excluding LULUCF, excluding indirect CO₂)**, where the effect of LULUCF is not taken into account:

Total net emissions (sector 1-6, excluding LULUCF, excluding indirect CO₂) =
 [1. Energy] + [2. Industrial Processes and product use] + [3. Agriculture] + [5. Waste] + [6. Other]

- **Total emissions (sector 1-6, excluding LULUCF, including indirect CO₂)**, where the effect of LULUCF is not taken into account, but indirect CO₂ emissions are included.

Total emissions (sector 1-6, excluding LULUCF, including indirect CO₂) =
 [1. Energy] + [2. Industrial Processes and product use] + [3. Agriculture]
 + [5. Waste] + [6. Other] + [indirect CO₂]

According to the new UNFCCC Reporting Guidelines, Annex I Parties may report indirect CO₂ from the atmospheric oxidation of CH₄, CO and NMVOCs. For Parties that decide to report indirect CO₂ the national totals shall be presented with and without indirect CO₂.

In most cases, total GHG emissions from LULUCF are negative (especially CO₂ emissions), therefore including the LULUCF sector into the calculation of total emissions results in lower emissions than when it is excluded (i.e. LULUCF is a net sink).

Emissions from international bunkers and multilateral operations are not included in total emissions (They are not covered by the reduction targets under the Kyoto Protocol). Carbon dioxide emissions from the combustion of biomass are not included in national totals and are reported separately as a Memo item.

1.5 What time periods are covered by emission data?

Emission data correspond to annual data.

They are available for every year since 1990. The latest emission data of year Y become available 18 months after the end of that year (e.g. final 2014 emissions usually became available in May 2016). Therefore the latest year for which emission data are reported in the viewer correspond to 2 or 3 years before the current year.

1.6 Emission units

Greenhouse gases emissions can be visualized in 3 distinct scales:

- in megagrams (Mg) 1 Mg = 1 tonne = 1 000 Kg;
- in gigagrams (Gg) 1 Gg = 1 000 tonnes = thousand tonnes;
- in teragrams (Tg) 1 Tg = 1 000 000 tonnes = 1 million tonnes.

This allows the user to adjust the unit relevant to displayed emission data. For example, the unit *Tg* is most relevant to view total national GHG emissions, while selecting the unit *Mg* might be more relevant to view emissions of a specific greenhouse gas for a specific sub-sector.

Note: As "Emission unit" entries are linked with the emissions data, selecting any measure other than absolute emissions statistics (for example: % change or index) will not have any effect on the data displayed.

1.7 Measures

The viewer can display data of different types: emission trends (in absolute values or index), absolute change from one year to another and relative change from one year to another, expressed in percentage.

1.7.1 Emissions: greenhouse gases emissions

Emissions can be displayed in 3 distinct scales, according to the "Emission unit" dimension (see [1.6 Emission units](#)). Member States use notation keys when an emission for a certain sector cannot be estimated.

Notation key	Definition
C	Confidential
IE	Included elsewhere
NA	Not applicable
NE	Not estimated
NO	Not occurring

1.7.2 Percentage change

Four distinct percentage change statistics are available. In the formulas below, E_{year} represents current year emission.

Statistic	Definition	Formula (E_{year} = selected year emission)
% change compared to 1990	Percentage change between 1990 and selected year emissions	$(E_{\text{year}} - E_{1990}) / E_{1990} * 100$
Annual % change (Y vs. Y - 1)	Percentage change between previous year and selected year emissions	$((E_{\text{year}} - E_{\text{year} - 1}) / E_{\text{year} - 1}) * 100$
5-year % change (Y vs. Y - 5)	Percentage change in emissions during the 5-year period preceding the selected year	$((E_{\text{year}} - E_{\text{year} - 5}) / E_{\text{year} - 5}) * 100$
10-year % change (Y vs. Y - 10)	Percentage change in emissions during the 10-year period preceding the selected year	$((E_{\text{year}} - E_{\text{year} - 10}) / E_{\text{year} - 10}) * 100$

Example: The screen shot below can be read: “In 2014, total CO₂ emissions (excluding LULUCF, including indirect CO₂) in EU28 (convention) were 19.7% lower than 10 years before (in 2004)”.

10-year % change (Y vs. Y-10)	
EU28 (Convention)	
CO2	
Total (without LULUCF, with indirect CO2) 2014	-19.7%

1.7.3 Index

One index is available.

Statistic	Definition	Formula (E_{year} = selected year emission)
Index (1990=100)	Index of current year emissions, with index 100 = 1990 emissions	$(E_{\text{year}} / E_{1990}) * 100$

Example: The screen shot below can be read: “In 2014, the index of CH₄ emissions (excluding LULUCF, including indirect CO₂) with 100 being 1990 emissions stands at 61.5 for EU28 (convention). This represents a decrease of 38.5% compared to 1990”.

Index (1990=100)		% change compared to 1990	
EU28 (Convention)		EU28 (Convention)	
CH4 - (CO2 equivalent)		CH4 - (CO2 equivalent)	
Total (without LULUCF, with indirect CO2) 2014	61.5		-38.5%

1.7.4 Emission change

Four distinct calculations of emissions change in absolute terms are available. In the formulas below, E_{year} represents current year emission. See also [1.6 Emission units](#).

Statistic	Definition	Formula (E_{year} = selected year emission)
Absolute change compared to 1990	Change in absolute emissions between 1990 and current year displayed	$E_{\text{year}} - E_{1990}$
Annual absolute change (Y vs. Y-1)	Change in absolute emissions between previous year and current year displayed	$E_{\text{year}} - E_{\text{year}-1}$
5-year absolute change (Y vs. Y-5)	Change in absolute emissions during the 5-year period preceding the selected year	$E_{\text{year}} - E_{\text{year}-5}$
10-year absolute change (Y vs. Y-10)	Change in absolute emissions during the 10-year period preceding the selected year	$E_{\text{year}} - E_{\text{year}-10}$

Example: The screen shot below can be read: “Total GHG emissions for the Energy sector decreased of 812.750 Tg in EU28 (convention) between 2004 and 2014”.

		Emissions	10-year absolute change (Y vs. Y-10)
		EU28 (Convention)	EU28 (Convention)
		All greenhouse gases - (CO2 equivalent)	All greenhouse gases - (CO2 equivalent)
		Tg (million tonnes)	Tg (million tonnes)
1 - Energy	2004	4136.685	+82.921
	2014	3323.935	-812.750

Note: The "Emission unit" dimension is relevant for the “emission change statistics”, switching between the “Emission unit” entries will change the unit of the visualized emissions.

1.7.5 Percentage share

Seven distinct percentage share statistics are available.

Statistic	Definition	Formula (E _{sector} = selected sector emission) (E _{country} = selected country emission) (E _{gas} = selected gas emission)
Share of total emissions (sectors 1-6, without 4. LULUCF, without indirect CO ₂) (%)	Percentage share of selected sector emission in total emissions (excluding emissions from LULUCF and excluding indirect CO ₂)	$(E_{\text{sector}} / \text{total emissions excl. 5. LULUCF, excl. indirect CO}_2) * 100$
Share of total emissions (sectors 1-6, with 4. LULUCF, without indirect CO ₂) (%)	Percentage share of selected sector emission in total emissions (including emissions from LULUCF and excluding indirect CO ₂)	$(E_{\text{sector}} / \text{total emissions incl. 5. LULUCF, excl. indirect CO}_2) * 100$
Share of total emissions (sectors 1-6, without 4. LULUCF, without indirect CO ₂) (%)	Percentage share of selected sector emission in total emissions (excluding emissions from LULUCF and including indirect CO ₂)	$(E_{\text{sector}} / \text{total emissions excl. 5. LULUCF, incl. indirect CO}_2) * 100$
Share of total emissions (sectors 1-6, with 4. LULUCF, with indirect CO ₂) (%)	Percentage share of selected sector emission in total emissions (including emissions from LULUCF and including indirect CO ₂)	$(E_{\text{sector}} / \text{total emissions incl. 5. LULUCF, incl. indirect CO}_2) * 100$
Share of total greenhouse gases (%)	Percentage share of selected gases emission in the total greenhouse gases	$(E_{\text{gas}} / E_{\text{all greenhouse gases}}) * 100$
% of EU28 (convention)	Percentage share of selected country emission in the EU28 (convention)	$(E_{\text{country}} / E_{\text{EU28 (convention)}}) * 100$
% of EU (KP)	Percentage share of selected country emission in the EU (KP)	$(E_{\text{country}} / E_{\text{EU (KP)}}) * 100$

Examples:

The screen shot below can be read: "In 2014, the waste sector represents 3.4% of total greenhouse gas emissions in EU28 (convention) (LULUCF and indirect CO₂ excluded)".

Share of total emissions (sectors 1-6, without 4. LULUCF, without indirect CO ₂) (%)	
EU28 (Convention)	
All greenhouse gases - (CO ₂ equivalent)	
5 - Waste management	2014 3.4%

The screen shot below can be read: "In 2014, road transport in Germany accounts for 18.3% of all EU28 (convention)".

% of EU28 (convention)	
Germany	
1.A.3.b - Road Transportation	2014 18.3%

The screen shot below can be read: “In 2014, CO₂ emissions account for 98.8% of the Total greenhouse gas emissions for the road transport in EU28 (convention)”

Share of total greenhouse gases (%)	
EU28 (Convention)	
CO ₂	
1.A.3.b - Road Transportation	2014 98.8%

1.7.6 Other Measures

Statistic	Definition
Emissions per capita	Ratio of total emissions divided by total population of the selected geographic entity. Note: the statistic is best viewed when the “unit scale” is set to Mg (tonne). The ratio emissions per capita can sometimes be lower than the display limit, which is 0.001.
Emissions per million € GDP (current prices)	Ratio of total emissions divided by GDP (current prices). Note1: the statistic is best viewed when the “unit scale” is set to Mg (tonne). The ratio emissions per GDP can sometimes be lower than the display limit, which is 0.001. Note2: this ratio is only available for latest year available (2014).

Examples:

The screen shot below can be read: “In 2014, CO₂ emissions per capita in EU28 (convention) are equal to 6.841 tonnes”.

Emissions per capita	
EU28 (Convention)	
Mg (tonnes)	
CO ₂	
Total (without LULUCF, with indirect CO ₂)	2014 6.841

The screen shot below can be read: “In 2014, CO₂ emissions per million GDP in EU28 (convention) are equal to 248.456 tonnes per million €”.

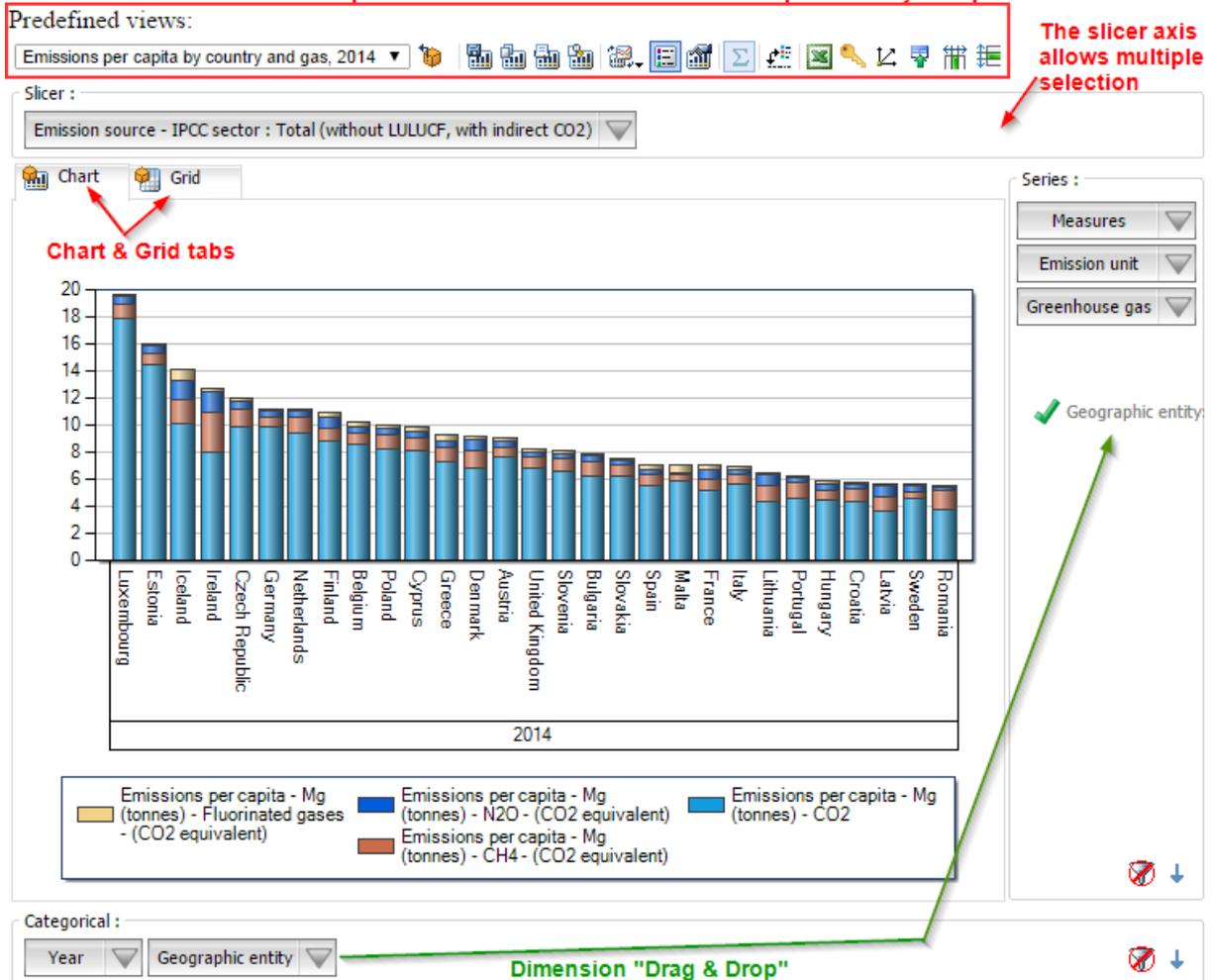
Emissions per million € GDP (current prices)	
EU28 (Convention)	
Mg (tonnes)	
CO ₂	
Total (without LULUCF, with indirect CO ₂)	2014 248.456

Data source for population data is Eurostat, for GDP (current prices) data the data source is the Ameco database.

2 General data viewer navigation

The following diagram represents some main elements and functionalities of the data viewer:

The toolbar includes the list of predefined views as well as different export and layout options



Predefined views:

The “Predefined views” drop down menu allows switching between generic pre-defined views.

Dimensions:

The greenhouse gas data viewer counts six distinct dimensions:

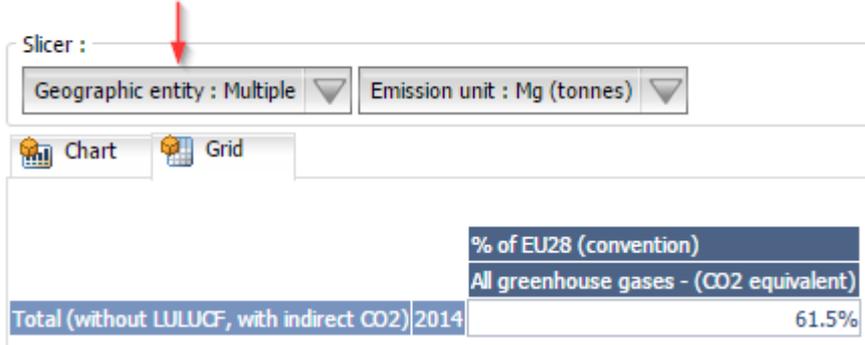
“Greenhouse gas”, “emission unit”, “year”, “measures”, “emission sources – IPCC sector” and “geographic entity”. Each dimension can be arranged within three distinct axis (drag and drop).

Axis: three distinct axis “Filter/Slicer”, “Series” and “Categorical”.

Note: the “Filter/Slicer” allows multiple member selection, and therefore offers many possibilities in terms of aggregation.

Example: the screen shot below can be read: “In 2014, Total emissions of GHG (LULUCF and CO₂ indirect excluded) in France, Germany, Italy, Spain and United Kingdom (KP) accounts for 61.5% in the EU28 (convention)”.

France, Germany, Italy, Spain and United Kingdom (KP) are selected



Chart/Grid tabs: the “Chart/Grid” tabs allow switching between chart view and grid view.