European Environment Agency

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 1990-2012.

The data and information reflected are fully consistent with those reported by the European Union to the United Nations Framework Convention on Climate Change in the Annual European Union greenhouse gas inventory 1990-2012 and inventory report 2014.

The manual is organised as follows:

1 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 CO_2 equivalent. For example: 1 kg of N_2O is equivalent to 310 kg of CO_2 in terms of global warming effect.

Greenhouse gas (GHG)	Global warming potential (GWP)
CO_2	1
CH_4	21
N_2O	310
SF_6	reported in CO_2 equivalent
HFCs	reported in CO_2 equivalent
PFCs	reported in CO_2 equivalent

Source: [Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22](#).

Fluorinated gases (CO_2 equ.) = (SF_6)+ (HFCs) + (PFCs)

All greenhouse gases - (CO2 equ.) = (CO_2) + (21 * CH_4) + (310 * N_2O) + (SF_6)+ (HFCs) + (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 and EU-15 country group aggregations.

In addition to EU-28 Member States, Iceland, Liechtenstein, Norway, Switzerland and Turkey are also available as well as the EEA33* and Eurozone** country group aggregations.

*EEA33: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom.

**Eurozone: Austria, Belgium, Cyprus, Estonia, Germany, Finland, France, Greece, Ireland, Italy, Latvia, Luxembourg, Malta, Netherlands, Portugal, Slovenia, Slovakia, Spain.

1.3 Which GHG-emitting sectors 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	Total emission of all greenhouse gases from stationary and mobile energy activities (fuel combustion as well as fugitive fuel emissions).
2	Industrial processes	By-product or fugitive emissions of greenhouse gases from industrial processes. Emissions from fuel combustion in industry are reported under Energy.
3	Solvent and other product use	Emissions resulting from the use of solvents and other products containing volatile compounds. This category pertains mainly to NMVOC[1] emissions resulting from the use of solvents and other products containing volatile compounds. All other non-energy emissions not included under Industrial Processes are included here.
4	Agriculture	All anthropogenic emissions from agriculture, except for fuel combustion emissions and sewage emissions, which are covered in Energy and Waste modules.
5	LULUCF (land use, land use change and forestry)	Total emissions and removals from activities relating to land use, land-use change and forestry (from the following categories: forest land, cropland, grassland, wetlands, settlements and other land).
6	Waste	Total emissions from solid waste disposal on land, wastewater, waste incineration and any other waste management activity. Any CO_2 emissions from fossil-based products (incineration or decomposition) are not included here. CO_2 from organic waste handling and decay are not included here.
7	Other	Emissions that do not fit under any other emission source/sink categories of the main categories described above.
8	International bunkers	Emissions resulting from fuel use in ships or aircraft engaged in international transport.
9	CO_2 Emissions from Biomass	
10	Multilateral Operations	

Note: The sum of sub-sectors may not always correspond to the sectors totals due to incomplete data delivered by some Member States.

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[1] Non-methane volatile organic compound

1.4 How are total emissions calculated?

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

- **Total net emissions (sectors 1-7, including 5. LULUCF**), which takes into account emission removals by carbon sinks.

> **Total net emissions (sectors 1-7, including 5. LULUCF**) =
>
> [Energy] + [Industrial Processes] + [Solvent and Other Product Use] + [Agriculture]
> + [Waste] + [Other] + [LULUCF (land use, land use change and forestry)]

- **Total emissions (sectors 1-7, excluding 5. LULUCF)**, where the effect of LULUCF is not taken into account:

> **Total emissions (sectors 1-7, excluding 5. LULUCF) =**
>
> [Energy] + [Industrial Processes] + [Solvent and Other Product Use] + [Agriculture]
> + [Waste] + [Other]

In most cases, total GHG emissions from LULUCF are negative (especially CO_2 emissions), therefore including the LULUCF sector into the calculation of total emissions results in lower emissions than when it is excluded.

Emissions from international bunkers are not included in total emissions (They are not covered by the reduction targets under the Kyoto Protocol).

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 2012 emissions became available in May 2014).
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 Kyoto Base-year emissions

The viewer provides base-year emissions for EU-28 Member States and for the EU-15 (only for "Total emissions (sectors 1-7, excluding 5. LULUCF)" and "All greenhouse gases - (CO2 equ.)").

1.7   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.

1.8   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.

1.8.1   Emissions: greenhouse gases emissions

Emissions can be displayed in 3 distinct scales, according to the "Emission unit" dimension (see 1.7 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 available
NE	Not estimated
NO	Not occurring

1.8.2 Percentage change

Five 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 Kyoto Base-year	Percentage change between base year and selected year emissions	$((E_{year} - E_{base\,year}) / E_{base\,year})*100$
% change compared to 1990	Percentage change between 1990 and selected year emissions	$(E_{year} - E_{1990})/ E_{1990}*100$
Annual % change (Y vs. Y − 1)	Percentage change between previous year and selected year emissions	$((E_{year} - E_{year-1})/ E_{year-1})*100$
5-year % change (Y vs. Y − 5)	Percentage change in emissions during the 5-year period preceding the selected year	$((E_{year} - E_{year-5})/ E_{year-5})*100$
10-year % change (Y vs. Y − 10)	Percentage change in emissions during the 10-year period preceding the selected year	$((E_{year} - E_{year-10})/ E_{year-10})*100$

Example: The screen shot below can be read: "*In 2012, total CO₂ emissions (excluding LULUCF) in the EU-15 were 13.3% lower than 10 years before (in 2002)*".

10-year % change (Y vs. Y-10)
EU15
All greenhouse gases - (CO2 equivalent)

Total emissions (sectors 1-7, excluding 5. LULUCF)	2012	-13.3%

1.8.3 Index

Two distinct indexes are available.

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

Example: The screen shot below can be read: "*In 2012, the index of CH₄ emissions (excluding LULUCF) with 100 being 1990 emissions stands at 66.6. This represents a decrease of 33.4% compared to 1990*".

Index (1990=100)	% change compared to 1990
EU15	EU15
CH4 - (CO2 equivalent)	CH4 - (CO2 equivalent)

Total emissions (sectors 1-7, excluding 5. LULUCF)	2012	66.6	-33.4%

1.8.4 Emission change

Five distinct calculations of emissions change in absolute terms are available. In the formulas below, E_{year} represents current year emission. See also 1.7 Emission units.

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

Example: The screen shot below can be read: *"Total GHG emissions for the Energy sector decreased of 419.767 Tg between 2002 and 2012"*.

		Emissions	10-year absolute change (Y vs. Y-10)
		EU15	EU15
		Tg (million tonnes)	Tg (million tonnes)
		All greenhouse gases - (CO2 equivalent)	All greenhouse gases - (CO2 equivalent)
1. Energy	2002	3312.903	+68.112
	2012	2893.137	-419.767

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.

1.8.5 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 1-7, excluding 5. LULUCF) (%)	Percentage share of selected sector emission in total emissions (excluding emissions from LULUCF)	(E_{sector} / total emissions excluding 5. LULUCF)*100
Share of total net emissions (sectors 1-7, including 5. LULUCF) (%)	Percentage share of selected sector emission in total emissions (including emissions from LULUCF)	(E_{sector} / total emissions including 5. LULUCF)*100
Share of total greenhouse gases (%)	Percentage share of selected gases emission in the total greenhouse gases	(E_{gas} / $E_{\text{all greenhouse gases}}$)*100
% of EU-15	Percentage share of selected country emission in the EU-15	($E_{country}$ / $E_{EU\text{-}15}$)*100
% of EU-28	Percentage share of selected country emission in the EU-28	($E_{country}$ / $E_{EU\text{-}28}$)*100
% of Eurozone	Percentage share of selected country emission in the Eurozone	($E_{country}$ / E_{EURO})*100
% of EEA33	Percentage share of selected country emission in the EEA33	($E_{country}$ / E_{EEA33})*100

Examples:

The screen shot below can be read: *"In 2012, the waste sector represents 3.1% of total greenhouse gas emissions in the EU-28 (LULUCF excluded)"*.

The screen shot below can be read: *"In 2012, road transport in EU-15 accounts for 85.3% of all EU-28 greenhouse gas emissions"*.

The screen shot below can be read: *"In 2012, CO2 emissions account for 98.9% of the Total greenhouse gas emissions for the road transport in EU-15"*

1.8.6 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 (2011).

Examples:

The screen shot below can be read: *"In 2012, CO_2 emissions per capita in the EU-28 are equal to 7.345 tonnes"*.

			Emissions per capita
			EU28
			CO2
Total emissions (sectors 1-7, excluding 5. LULUCF)	2012	Mg (tonnes)	7.345

The screen shot below can be read: *"In 2012, CO_2 emissions per million GDP in the EU-28 are equal to 286.823 tonnes per million €"*.

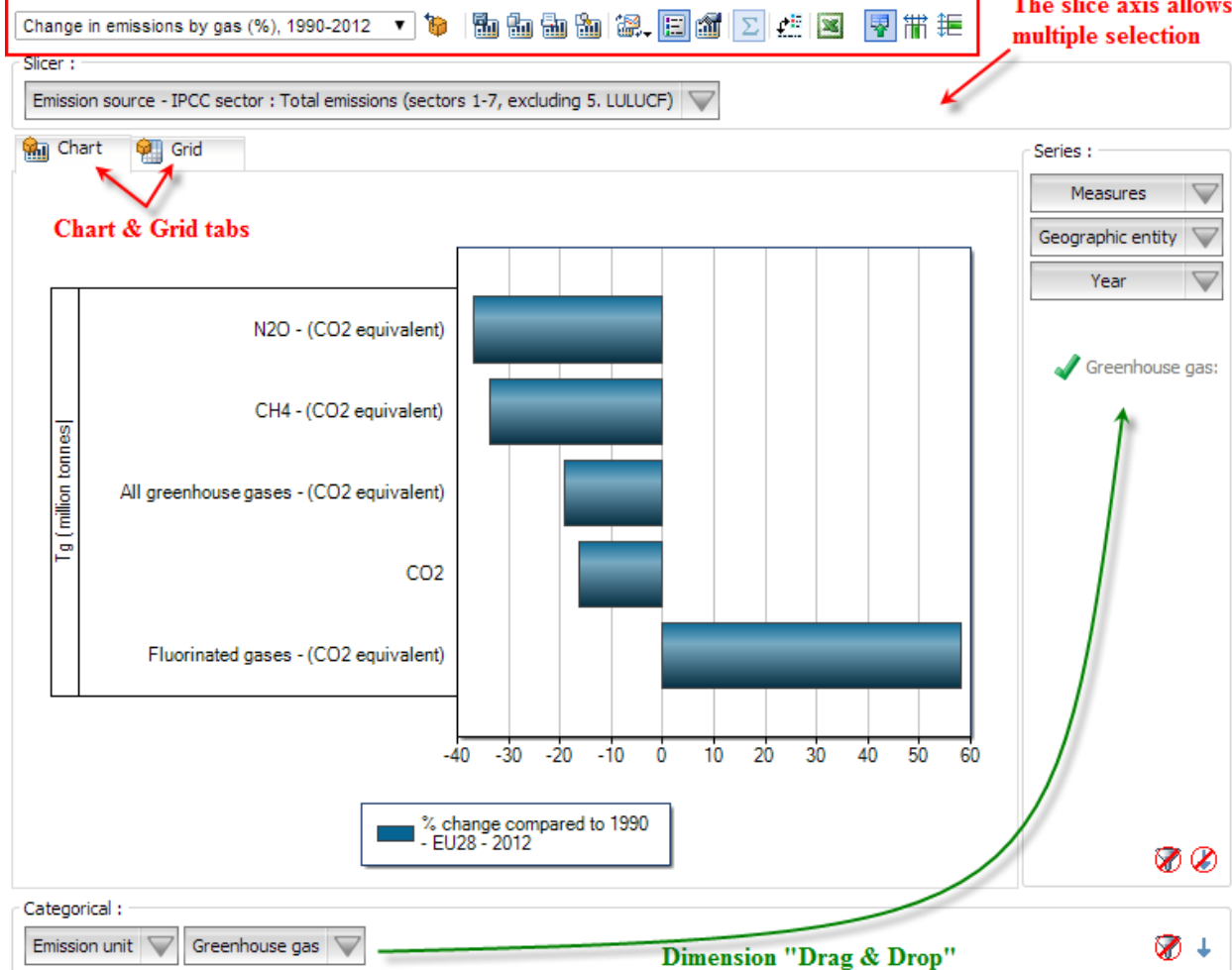|			Emissions per million € GDP (current prices)
			EU28
			CO2
Total emissions (sectors 1-7, excluding 5. LULUCF)	2012	Mg (tonnes)	286.823

Data source for population and GDP (current prices) is Eurostat.

2 General data viewer navigation

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

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 – IPCCC 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 2012, Total emissions of GHG (LULUCF excluded) in France, Germany, Italy, Spain and United Kingdom accounts for 77.7% in the EU-15"*.

Chart/Grid tabs: the "Chart/Grid" tabs allow easy switch between chart view and grid view.