

# PRIMAP-crf: UNFCCC CRF data in IPCC categories (2021v1, April, 2021)

## Recommended citation

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When using the data, please cite:

Gütschow, J.; Jeffery, L.; Guenther, A. (2021): PRIMAP-crf: UNFCCC CRF data in IPCC categories (2021v1). <https://doi.org/10.5281/zenodo.4723476>, 2021

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## Use of the dataset and full description

A full description of a previous version of the dataset can be found in:

Jeffery, M. L., Gütschow, J., Gieseke, R., and Gebel, R.: PRIMAP-crf: UNFCCC CRF data in IPCC 2006 categories, *Earth Syst. Sci. Data*, 10, 1427-1438, <https://doi.org/10.5194/essd-10-1427-2018>, 2018

An update of the description paper for is under preparation.

If you use this dataset, we would appreciate a brief notification to the lead author ([johannes.guetschow@pik-potsdam.de](mailto:johannes.guetschow@pik-potsdam.de)) with a description of how the data was used. This information can help to guide the production of future updates to the dataset.

New versions of the UNFCCC CRF data are released annually with an additional year of data. Some countries also submit revised versions of their data through the year. Where possible, the PRIMAP-crf data will be updated accordingly and a revised dataset released. Data releases with an additional year of data are indicated in the naming of the data - the year of data publication is indicated by the dataset name, e.g. PRIMAP-crf-2021 data includes data first released by countries in 2021. Inclusion of subsequent data revisions from the same year are indicated by the version number, for example PRIMAP-crf-2020-v2 includes all CRF2020 data published until 12th January 2021.

When using this dataset or one of its updates, please cite the DOI of the precise version of the dataset used and also the data description article which this dataset is supplement to (see above).

Since version 2020v2 we use the data formats developed for the PRIMAP2 climate policy analysis suite: [PRIMAP2 on GitHub](#). The data is published both in the interchange format which consists of a csv file with the data and a yaml file with additional metadata and the native NetCDF based format. For a detailed description of the data format we refer to the [PRIMAP2 documentation](#).

## Support

If you need support in using the dataset or have any other questions regarding the dataset, please contact Dr. Johannes Gütschow at [johannes.guetschow@pik-potsdam.de](mailto:johannes.guetschow@pik-potsdam.de).

If you wish to use the .csv file in excel but the data does not appear to display correctly, you need to set the delimiter character. To do so:

- highlight the first column
- Under the 'Data' tab, select 'Text to columns'
- In the first pop-up window, select 'Delimited'
- In the second pop-up, select 'comma' separated values
- No selection needed in the third pop-up, click Finish and the data should display correctly.

## Abstract

PRIMAP-crf is a processed version of data reported by countries to the United Nations Framework Convention on Climate Change (UNFCCC) in the Common Reporting Format (CRF). The processing has three key aspects: 1) Data from individual countries and years are combined into one file. 2) Data is re-organised to follow the IPCC 2006 hierarchical categorisation. 3) 'Baskets' of gases are calculated according to different global warming potential estimates from each of the three most recent IPCC reports.

## Sources

The original CRF data is all freely available via the UNFCCC website <https://unfccc.int/ghg-inventories-annex-i-parties/2021>. Please consider also citing this source in any work that you produce using PRIMAP-crf.

This dataset includes all 2021 CRF data available as of 19th April, 2021. For later data updates, please check the PRIMAP-crf page of the Paris Reality Check website <https://www.pik-potsdam.de/paris-reality-check/primap-crf/> or updates to the Zenodo repository.

## Files included in the dataset

- **Guetschow-et-al-2021-PRIMAP-crf\_2021-v1.csv** : primary data file with data in IPCC 2006 categories in PRIMAP2 interchange format
- **Guetschow-et-al-2021-PRIMAP-crf\_2021-v1.yaml** : metadata in PRIMAP2 interchange format for the primary csv data file
- **Guetschow-et-al-2021-PRIMAP-crf\_2021-v1.nc** : primary data file with data in IPCC 2006 categories in PRIMAP2 NetCDF format (metadata included)
- **Guetschow-et-al-2021-PRIMAP-crf96\_2021-v1.csv** : additional data file with data in IPCC 1996 categories in PRIMAP2 interchange format
- **Guetschow-et-al-2021-PRIMAP-crf96\_2021-v1.yaml** : metadata in PRIMAP2 interchange format for the additional csv data file
- **Guetschow-et-al-2021-PRIMAP-crf96\_2021-v1.nc** : additional data file with data in IPCC 1996 categories in PRIMAP2 NetCDF format (metadata included)
- **PRIMAP-crf-IPCC2006-category-codes.csv** : definitions of IPCC 2006 category codes used in PRIMAP-crf
- **primap-crf-data-description-2021v1.pdf** : data description document

## Data format description (columns)

The PRIMAP-crf data in the comma-separated values (CSV) files is formatted consistently with the PRIMAP2 interchange format.

The data contained in each column is as follows:

### source

Name of the data source. Here: PRIMAP-crf.

### scenario (PRIMAP)

The scenario refers to the year of the UNFCCC submissions (in this case 2021), and the revision number (here v1). 2021v1 includes all 2021 data released until 19th April 2021. Previous versions are available for the emissions data reported in 2017 (Jeffery et al., 2018), 2018 (Gütschow et al., 2019), 2019 (Gütschow et al., 2020), and 2020 (Gütschow et al., 2021).

### provenance

Provenance of the data. Here: “measured” as it is an original source.

### country (ISO3)

ISO 3166 three-letter country codes.

Additionally, the European Union is included as the sum of its 28 pre-Brexit member states with the code “EU28” and as the sum of its 27 post-Brexit member states with the code “EU27BX”. The EU data is the sum of the data of its member states, not the data officially reported to the UNFCCC by the EU.

### entity

The gases and gas baskets. Where a global warming potential (GWP) is used it is given in parentheses. GWP weighted data is only provided for the gas baskets KYOTOGHG, FGASES, HFCS, PFCS, OTHERHFCS, and OTHERPFCS. We use 100 year global warming potentials from either IPCC Second Assessment Report (SARGWP100), Assessment Report 4 (AR4GWP100), Assessment Report 5 (AR5GWP100), or Assessment Report 5 with carbon-cycle feedbacks (AR5CCFGWP100). Where no global warming potential is specified, quantities are given in absolute weights of the gas.

Table 1: Gas names

Code	Description
CH4	Methane
CO2	Carbon Dioxide
N2O	Nitrous Oxide
SF6	Sulfur Hexafluoride
NF3	Nitrogen Trifluoride
HFC125	Pentafluoroethane, HFC-125
HFC134	Tetrafluoroethane, HFC-134
HFC134A	Tetrafluoroethane, HFC-134a
HFC143	Trifluoroethane, HFC-143
HFC143A	Trifluoroethane, HFC-143a
HFC152A	1,1-Difluoroethane, HFC-152a
HFC227EA	Heptafluoropropane, HFC-227a
HFC23	Trifluoromethane, HFC-23
HFC236FA	1,1,1,3,3,3-hexafluoropropane, HFC-236fa
HFC245CA	1,1,2,2,3-pentafluoropropane, HFC-245ca
HFC245FA	Enovate, HFC-245fa

Code	Description
HFC32	Difluoromethane, HFC-32
HFC365MFC	1,1,1,3,3-pentafluorobutane, HFC-365mfc
HFC41	Fluoromethane, HFC-41
HFC4310	1,1,1,2,3,4,4,5,5,5-decafluoropentane, HFC-43-10
OTHERHFCs	Unspecified mix of HFCs (GWP as in reporting)
HFCS	Hydrofluorocarbons (SAR)
C2F6	Hexafluoroethane, C2F6
C3F8	Octafluoropropane, C3F8
C4F10	Perfluorobutane, C4F10
C5F12	Dodecafluoropentane, C5F12
C6F14	Perfluorohexane, C6F14
CC4F8	Octafluorocyclobutane, cC4F8
CF4	Tetrafluoromethane, CF4
OTHERPFCS	Unspecified mix of PFCs (GWP as in reporting)
PFCS	Perfluorocarbons (SAR)
FGASES	Fluorinated Gases (SAR)
KYOTOGHG	Kyoto greenhouse gases (SAR)
NMVOC	Non-Methane Volatile Organic Compounds
NOX	Nitrogen Oxide
SO2	Sulfur dioxide
CO	Carbon Monoxide

## unit

Units are either “t <substance> / yr”, or “kt <substance> / yr”. For data in CO<sub>2</sub>-equivalent units the substance is CO<sub>2</sub>. The CO<sub>2</sub>-equivalent is calculated according to the global warming potential indicated by the entity (see above).

## category (IPCC2006) (or category (IPCC1996))

IPCC (Intergovernmental Panel on Climate Change) 1996 or 2006 category codes. Please see the accompanying file PRIMAP-crf-IPCC2006-category-codes.csv for a definition of codes used for IPCC 2006 categories.

Data for 1996 categories are shared for the top level categories only, as defined below.

Category code Description

Table 2: Category descriptions using IPCC 1996 terminology.

0	National Total
M.0.EL	National Total, excluding LULUCF
1	Total Energy
1.A	Fuel Combustion Activities
1.B	Fugitive Emissions from Fuels
2	Industrial Processes
3	Solvent and Other Product Use
4	Agriculture
5	Land Use, Land Use Change, and Forestry (LULUCF)
6	Waste
7	Other

## Remaining columns

All remaining columns are years from 1986 to 2019. These columns contain the relevant data for that year. All data are given to three significant figures and displayed in scientific notation.

## Missing data

In the final dataset there are some missing data where no data was originally reported. For years 1990 onward, this either means that emissions of that gas, in that category were negligible or too difficult for the country to measure. However, please see the individual country national inventory reports (UNFCCC, 2021) for country specific information.

Only a few countries report data prior to 1990, for all other countries there is no data given in PRIMAP-crf. This does not, however, mean that emissions were zero or negligible in those years for those countries.

Missing data are ignored, or treated as zero, when calculating sums for baskets of multiple greenhouse gases or country groups. This means that any Kyoto-GHG baskets are sums across reported data only. Similarly, emissions from the EU for years prior to 1990 reflect the sum of emissions only for those countries that report data for those years, and not the true total for the EU.

## References

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