

# Package ‘carbodata’

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**Title** Access Carbon Market Data from Emissions Trading Systems and Voluntary Registries

**Version** 0.1.0

**Description** Unified access to carbon market data from compliance emissions trading systems ('EU ETS', 'UK ETS', 'RGGI', California Cap-and-Trade) and voluntary carbon markets (Verra, Gold Standard, American Carbon Registry, Climate Action Reserve, via the Berkeley Voluntary Registry Offsets Database and the 'CarbonPlan' 'OffsetsDB' API). Includes cross-market price data from the 'International Carbon Action Partnership' ('ICAP') Allowance Price Explorer <<https://icapcarbonaction.com/en/ets-prices>>, global carbon pricing from the World Bank Carbon Pricing Dashboard <<https://carbonpricingdashboard.worldbank.org/>>, and the historical 'RFF' World Carbon Pricing Database following Dolphin, Pollitt and Newbery (2020) <[doi:10.1038/s41597-022-01659-x](https://doi.org/10.1038/s41597-022-01659-x)>. Data is downloaded from public sources on first use and cached locally.

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**License** MIT + file LICENSE

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**Config/testthat/edition** 3

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---

co2_cache_info	<i>Inspect the local carbondata cache</i>
----------------	---

---

### Description

Returns information about the local cache: directory, file count, size, and list of cached files. Useful for debugging stale results or deciding whether to call `co2_clear_cache()`.

### Usage

```
co2_cache_info()
```

### Value

A list with elements `dir`, `n_files`, `size_bytes`, `size_human`, and `files` (a data frame with `name`, `size_bytes`, `modified`).

### See Also

Other configuration: `co2_clear_cache()`

## Examples

```
op <- options(carbondata.cache_dir = tempdir())
co2_cache_info()
options(op)
```

---

co2\_cad\_trust

*Climate Action Data Trust (not supported in v0.1.0)*

---

## Description

CAD Trust is the Chia-Network "cad" software designed to be self-hosted. There is no unauthenticated public API. To use CAD Trust data you must either:

- Self-host a cad node, or
- Arrange a private partnership for API access via <https://climateactiondata.org/how-to-connect/>

## Usage

```
co2_cad_trust(...)
```

## Arguments

... Ignored.

## Details

This function is a placeholder that errors with guidance. CAD Trust support is deferred to carbon-data v0.2.0 once CAD Trust offers a stable public endpoint.

## Value

Never returns (always errors).

## See Also

Other voluntary markets: [co2\\_offsets\\_db\(\)](#), [co2\\_vrod\(\)](#)

## Examples

```
## Not run:
co2_cad_trust()

## End(Not run)
```

---

co2\_california\_caps    *California overall emissions caps*

---

**Description**

Fetches the California Cap-and-Trade program overall cap and allocation channels, by vintage year.

**Usage**

```
co2_california_caps(refresh = FALSE)
```

**Arguments**

refresh            Re-download? Default FALSE.

**Value**

A data frame.

**See Also**

Other compliance markets: [co2\\_california\\_prices\(\)](#), [co2\\_rggi\\_allowances\(\)](#), [co2\\_rggi\\_state\\_proceeds\(\)](#), [co2\\_ukets\(\)](#), [co2\\_ukets\\_allocations\(\)](#)

**Examples**

```
## Not run:  
caps <- co2_california_caps()  
  
## End(Not run)
```

---

co2\_california\_prices    *California Cap-and-Trade auction settlement prices*

---

**Description**

Fetches the California Air Resources Board auction settlement price time series, updated quarterly after each joint California- Quebec auction.

**Usage**

```
co2_california_prices(refresh = FALSE)
```

**Arguments**

refresh            Re-download? Default FALSE.

**Value**

A data frame with `joint_auction`, `quarter`, `settlement_price_usd`, `reserve_price_usd`.

**See Also**

Other compliance markets: [co2\\_california\\_caps\(\)](#), [co2\\_rggi\\_allowances\(\)](#), [co2\\_rggi\\_state\\_proceeds\(\)](#), [co2\\_ukets\(\)](#), [co2\\_ukets\\_allocations\(\)](#)

**Examples**

```
## Not run:
prices <- co2_california_prices()

## End(Not run)
```

---

co2_clear_cache	<i>Clear the carbondata cache</i>
-----------------	-----------------------------------

---

**Description**

Deletes all locally cached carbon market data files. The next call to any data function will re-download.

**Usage**

```
co2_clear_cache()
```

**Value**

Invisibly returns NULL.

**See Also**

Other configuration: [co2\\_cache\\_info\(\)](#)

**Examples**

```
op <- options(carbondata.cache_dir = tempdir())
co2_clear_cache()
options(op)
```

---

co2\_euets\_allocations *EU ETS free allowance allocations*

---

### Description

Returns free allowance allocations per installation per year. Same source file as [co2\\_euets\\_emissions\(\)](#).

### Usage

```
co2_euets_allocations(  
  country = NULL,  
  year = NULL,  
  file_year = NULL,  
  refresh = FALSE  
)
```

### Arguments

country	Optional character vector of two-letter registry codes to filter (e.g. <code>c("DE", "FR", "PL")</code> ).
year	Optional integer vector of emissions years. When NULL, returns all years in the latest published file. Note that the file year (e.g. "2025") refers to publication year; emissions data covers calendar years up to publication year -1.
file_year	Publication year of the DG CLIMA file to use. Default is the latest year available in the package (see <a href="#">co2_euets_files()</a> ).
refresh	Logical. Re-download? Default FALSE.

### Value

A data frame with `country`, `installation_id`, `year`, `allocation_eua`.

### See Also

Other EU ETS: [co2\\_euets\\_emissions\(\)](#), [co2\\_euets\\_files\(\)](#), [co2\\_euets\\_installations\(\)](#), [co2\\_euets\\_price\(\)](#), [co2\\_euets\\_surrendered\(\)](#)

### Examples

```
## Not run:  
alloc <- co2_euets_allocations(country = "DE")  
  
## End(Not run)
```

---

co2\_euets\_emissions    *EU ETS verified emissions*

---

## Description

Fetches annual verified greenhouse-gas emissions for installations covered by the EU Emissions Trading System, from the DG CLIMA Union Registry bulk download. Coverage: ~10,000 stationary installations plus ~1,500 aircraft operators across the EU, EEA, and linked Swiss ETS. Emissions data from 2005 onwards; annual files published each April for the prior compliance year.

## Usage

```
co2_euets_emissions(  
  country = NULL,  
  year = NULL,  
  file_year = NULL,  
  refresh = FALSE  
)
```

## Arguments

country	Optional character vector of two-letter registry codes to filter (e.g. <code>c("DE", "FR", "PL")</code> ).
year	Optional integer vector of emissions years. When NULL, returns all years in the latest published file. Note that the file year (e.g. "2025") refers to publication year; emissions data covers calendar years up to publication year -1.
file_year	Publication year of the DG CLIMA file to use. Default is the latest year available in the package (see <a href="#">co2_euets_files()</a> ).
refresh	Logical. Re-download? Default FALSE.

## Value

A data frame with columns `country`, `installation_id`, `installation_name`, `activity`, `year`, `verified_emissions_tco2e`, `allocation_eua`.

## See Also

Other EU ETS: [co2\\_euets\\_allocations\(\)](#), [co2\\_euets\\_files\(\)](#), [co2\\_euets\\_installations\(\)](#), [co2\\_euets\\_price\(\)](#), [co2\\_euets\\_surrendered\(\)](#)

## Examples

```
## Not run:  
de <- co2_euets_emissions(country = "DE")  
  
## End(Not run)
```

---

co2_euets_files	<i>List the EU ETS data file versions bundled with this package</i>
-----------------	---

---

**Description**

Returns a data frame of the DG CLIMA file vintages supported. When DG CLIMA publishes a newer file, upgrade the package.

**Usage**

```
co2_euets_files()
```

**Value**

A data frame.

**See Also**

Other EU ETS: [co2\\_euets\\_allocations\(\)](#), [co2\\_euets\\_emissions\(\)](#), [co2\\_euets\\_installations\(\)](#), [co2\\_euets\\_price\(\)](#), [co2\\_euets\\_surrendered\(\)](#)

**Examples**

```
co2_euets_files()
```

---

co2_euets_installations	<i>EU ETS installation registry</i>
-------------------------	-------------------------------------

---

**Description**

Returns the registry of stationary EU ETS installations with operator name, activity type, country, city, and permit details. Sourced from the DG CLIMA Union Registry snapshot.

**Usage**

```
co2_euets_installations(country = NULL, refresh = FALSE)
```

**Arguments**

country	Optional two-letter registry codes.
refresh	Re-download? Default FALSE.

**Value**

A data frame.

**See Also**

Other EU ETS: [co2\\_euets\\_allocations\(\)](#), [co2\\_euets\\_emissions\(\)](#), [co2\\_euets\\_files\(\)](#), [co2\\_euets\\_price\(\)](#), [co2\\_euets\\_surrendered\(\)](#)

**Examples**

```
## Not run:
inst <- co2_euets_installations(country = "PL")

## End(Not run)
```

---

co2_euets_price	<i>EU ETS allowance (EUA) auction settlement prices</i>
-----------------	---

---

**Description**

Fetches EU Allowance (EUA) primary-auction settlement prices from the EEX public auction report. Auctions are held several times per week; each year's file accumulates all auctions for that year.

**Usage**

```
co2_euets_price(from = NULL, to = NULL, year = NULL, refresh = FALSE)
```

**Arguments**

from, to	Optional character or Date. Date range.
year	Optional integer year. If supplied, only the file for that year is fetched (faster than from/to).
refresh	Re-download? Default FALSE.

**Value**

A data frame with date, auction\_name, contract, status, price\_eur, min\_bid\_eur, max\_bid\_eur, volume\_t.

**See Also**

Other EU ETS: [co2\\_euets\\_allocations\(\)](#), [co2\\_euets\\_emissions\(\)](#), [co2\\_euets\\_files\(\)](#), [co2\\_euets\\_installations](#), [co2\\_euets\\_surrendered\(\)](#)

**Examples**

```
## Not run:
prices <- co2_euets_price(year = 2025)

## End(Not run)
```

---

co2\_euets\_surrendered *EU ETS compliance status and cumulative surrendered units*

---

## Description

Returns cumulative total surrendered allowances per installation, compliance code, and account closure date. Per-year surrender events require the EUTL transaction log ZIP, which is deferred to v0.2.0 because it is ~1.5 GB uncompressed and requires LZMA extraction.

## Usage

```
co2_euets_surrendered(country = NULL, file_year = NULL, refresh = FALSE)
```

## Arguments

country	Optional two-letter registry codes.
file_year	Publication year of the compliance file. Default is the latest in the package.
refresh	Re-download? Default FALSE.

## Value

A data frame with country, installation\_id, installation\_name, compliance\_code, compliance\_status, total\_verified\_emissions, total\_surrendered\_allowances, year\_of\_first\_emissions, year\_of\_last\_emissions, account\_closure.

## See Also

Other EU ETS: [co2\\_euets\\_allocations\(\)](#), [co2\\_euets\\_emissions\(\)](#), [co2\\_euets\\_files\(\)](#), [co2\\_euets\\_installations](#), [co2\\_euets\\_price\(\)](#)

## Examples

```
## Not run:  
comp <- co2_euets_surrendered(country = "FR")  
  
## End(Not run)
```

---

co2_icap_prices	<i>ICAP Allowance Price Explorer</i>
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---

**Description**

Fetches allowance prices across 20+ Emissions Trading Systems from the International Carbon Action Partnership (ICAP) Allowance Price Explorer. Covers EU ETS, UK ETS, California, RGGI, New Zealand, Korea, and other jurisdictions with auction and secondary-market prices where available.

**Usage**

```
co2_icap_prices(jurisdiction = NULL, refresh = FALSE)
```

**Arguments**

jurisdiction	Optional character vector. Filter by jurisdiction name (e.g. c("Regional Greenhouse Gas Initiative", "EU ETS")). When NULL, returns all.
refresh	Re-download? Default FALSE.

**Value**

A data frame with date, jurisdiction, market\_type ("primary" auction or "secondary"), price, and currency.

**See Also**

Other aggregators: [co2\\_rff\\_pricing\(\)](#), [co2\\_world\\_bank\(\)](#)

**Examples**

```
## Not run:  
prices <- co2_icap_prices(jurisdiction = "EU ETS")  
  
## End(Not run)
```

---

co2_markets	<i>List supported carbon markets</i>
-------------	--------------------------------------

---

**Description**

Returns a data frame of the carbon markets (compliance and voluntary) supported by this package, with coverage metadata.

**Usage**

```
co2_markets(type = c("all", "compliance", "voluntary"))
```

**Arguments**

type                    Character. One of "all" (default), "compliance", or "voluntary".

**Value**

A data frame with columns market, name, type, coverage\_start, jurisdiction, function\_name, and notes.

**Examples**

```
co2_markets()
co2_markets(type = "compliance")
```

---

co2_offsets_db	<i>CarbonPlan OffsetsDB (via S3 parquet)</i>
----------------	--

---

**Description**

Fetches the CarbonPlan OffsetsDB daily snapshots of voluntary carbon market projects and credits, stored as Parquet in a public S3 bucket. Covers Verra, ART TREES, Gold Standard, American Carbon Registry, and Climate Action Reserve.

**Usage**

```
co2_offsets_db(kind = c("projects", "credits"), date = NULL, refresh = FALSE)
```

**Arguments**

kind                    Character. "projects" (default) or "credits".

date                    Optional character. ISO date of the snapshot to fetch (must be a day CarbonPlan published; the function walks backwards from this date up to 7 days). Default Sys.Date().

refresh                Re-download? Default FALSE.

**Details**

The CarbonPlan REST API at `offsets-db-api.carbonplan.org` was deprecated; this function uses the S3 bucket directly. Parquet reading requires an installed Parquet reader; the arrow package is the recommended suggest.

**Value**

A file path to the downloaded Parquet file. The caller must have arrow or nanoparquet installed to read it.

**See Also**

Other voluntary markets: [co2\\_cad\\_trust\(\)](#), [co2\\_vrod\(\)](#)

## Examples

```
## Not run:
path <- co2_offsets_db("projects")
df <- arrow::read_parquet(path)

## End(Not run)
```

---

co2_rff_pricing	<i>RFF World Carbon Pricing Database</i>
-----------------	--

---

## Description

Fetches the Dolphin-Pollitt-Newbery World Carbon Pricing Database for one country. Covers national-level carbon pricing from 1989 to present, with CO2 tax and ETS instruments harmonised across 200+ jurisdictions.

## Usage

```
co2_rff_pricing(country, version = "v2026.1", refresh = FALSE)
```

## Arguments

country	Character. Country name using underscores (e.g. "United_Kingdom", "Germany", "Antigua_and_Barbuda").
version	Character. Dataset version folder. Default "v2026.1".
refresh	Re-download? Default FALSE.

## Value

A data frame of annual carbon prices by IPCC sector code.

## References

Dolphin, G. G., Pollitt, M. G. and Newbery, D. M. (2020). "The political economy of carbon pricing: a panel analysis." *Oxford Economic Papers*, 72(2), 472–500. doi:[10.1093/oenp/gpz042](https://doi.org/10.1093/oenp/gpz042)

## See Also

Other aggregators: [co2\\_icap\\_prices\(\)](#), [co2\\_world\\_bank\(\)](#)

## Examples

```
## Not run:
uk <- co2_rff_pricing("United_Kingdom")

## End(Not run)
```

---

co2\_rggi\_allowances *RGGI allowance distribution by state and year*

---

### Description

Fetches the Regional Greenhouse Gas Initiative (RGGI) annual CO2 allowance distribution table from the public RGGI website. Covers 11 participating US states from 2009 onwards.

### Usage

```
co2_rggi_allowances(year = NULL, refresh = FALSE)
```

### Arguments

year	Integer year (2009-present). Default is the current year.
refresh	Re-download? Default FALSE.

### Details

Auction clearing prices are NOT returned here because RGGI publishes them only as per-auction PDFs (no CSV aggregation exists). For RGGI prices, use [co2\\_icap\\_prices\(\)](#) with jurisdiction = "Regional Greenhouse Gas Initiative".

### Value

A data frame of allowance distribution by state.

### See Also

Other compliance markets: [co2\\_california\\_caps\(\)](#), [co2\\_california\\_prices\(\)](#), [co2\\_rggi\\_state\\_proceeds\(\)](#), [co2\\_ukets\(\)](#), [co2\\_ukets\\_allocations\(\)](#)

### Examples

```
## Not run:  
a <- co2_rggi_allowances(year = 2026)  
  
## End(Not run)
```

---

`co2_rggi_state_proceeds`*RGGI cumulative state proceeds by auction*

---

**Description**

Fetches cumulative auction proceeds time series for one RGGI state, indexed by auction number. Derived from the per-state XLSX files on [rggi.org](http://rggi.org). Combining all states gives the full RGGI auction time series.

**Usage**

```
co2_rggi_state_proceeds(state, refresh = FALSE)
```

**Arguments**

<code>state</code>	Two-letter state code (one of: CT, DE, MA, MD, ME, NH, NJ, NY, RI, VA, VT).
<code>refresh</code>	Re-download? Default FALSE.

**Value**

A data frame.

**See Also**

Other compliance markets: [co2\\_california\\_caps\(\)](#), [co2\\_california\\_prices\(\)](#), [co2\\_rggi\\_allowances\(\)](#), [co2\\_ukets\(\)](#), [co2\\_ukets\\_allocations\(\)](#)

**Examples**

```
## Not run:  
ny <- co2_rggi_state_proceeds("NY")  
  
## End(Not run)
```

---

`co2_ukets`*UK ETS verified emissions and surrenders*

---

**Description**

Fetches the UK Emissions Trading Scheme Section 4 compliance report (verified emissions and allowance surrenders per account per scheme year), published annually by the UK Emissions Trading Registry after the 30 April reconciliation deadline.

**Usage**

```
co2_ukets(refresh = FALSE)
```

**Arguments**

refresh            Re-download? Default FALSE.

**Value**

A data frame with one row per account-year.

**See Also**

Other compliance markets: [co2\\_california\\_caps\(\)](#), [co2\\_california\\_prices\(\)](#), [co2\\_rggi\\_allowances\(\)](#), [co2\\_rggi\\_state\\_proceeds\(\)](#), [co2\\_ukets\\_allocations\(\)](#)

**Examples**

```
## Not run:  
uk <- co2_ukets()  
  
## End(Not run)
```

---

co2\_ukets\_allocations    *UK ETS free allocations*

---

**Description**

Fetches the UK ETS free-allocation table for stationary installations (OHA) published by DESNZ on GOV.UK. Filename includes a media GUID that changes when DESNZ republishes, so the package scrapes the stable publications landing page.

**Usage**

```
co2_ukets_allocations(sector = c("installations", "aviation"), refresh = FALSE)
```

**Arguments**

sector            Character. "installations" (default) for stationary installations, "aviation" for aviation allocations.

refresh           Re-download? Default FALSE.

**Value**

A data frame.

**See Also**

Other compliance markets: [co2\\_california\\_caps\(\)](#), [co2\\_california\\_prices\(\)](#), [co2\\_rggi\\_allowances\(\)](#), [co2\\_rggi\\_state\\_proceeds\(\)](#), [co2\\_ukets\(\)](#)

**Examples**

```
## Not run:  
alloc <- co2_ukets_allocations()  
  
## End(Not run)
```

---

co2\_vrod

*Berkeley Voluntary Registry Offsets Database*

---

**Description**

Fetches the Berkeley GSPP Voluntary Registry Offsets Database, an aggregator of Verra, Gold Standard, ACR, CAR, and ART TREES project registrations and issuances. Released bimonthly under CC BY 4.0.

**Usage**

```
co2_vrod(refresh = FALSE)
```

**Arguments**

refresh	Re-download? Default FALSE. Each release has a date-stamped filename; the package scrapes the landing page to find the latest release on each call unless a cached copy exists.
---------	---

**Value**

A data frame of project-level data.

**See Also**

Other voluntary markets: [co2\\_cad\\_trust\(\)](#), [co2\\_offsets\\_db\(\)](#)

**Examples**

```
## Not run:  
vrod <- co2_vrod()  
  
## End(Not run)
```

---

`co2_world_bank`*World Bank Carbon Pricing Dashboard*

---

**Description**

Fetches the World Bank Carbon Pricing Dashboard Excel file, which covers 70+ carbon pricing initiatives worldwide (carbon taxes + ETS) with price, coverage, and revenue data.

**Usage**

```
co2_world_bank(refresh = FALSE)
```

**Arguments**

`refresh` Re-download? Default FALSE.

**Details**

The World Bank publishes a dated file every 6-12 months. This function scrapes the landing page to find the latest release.

**Value**

A data frame.

**See Also**

Other aggregators: [co2\\_icap\\_prices\(\)](#), [co2\\_rff\\_pricing\(\)](#)

**Examples**

```
## Not run:  
wb <- co2_world_bank()  
  
## End(Not run)
```

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