Package ‘eia’

May 9, 2020

Title API Wrapper for ‘US Energy Information Administration’ Open Data

Version 0.3.6

Description Provides API access to data from the ‘US Energy Information Administration’ (‘EIA’) <https://www.eia.gov>.

Use of the API requires a free API key obtainable at <https://www.eia.gov/opendata/register.php>.

The package includes functions for searching ‘EIA’ data categories and importing time series and geoset time series datasets.

Datasets returned by these functions are provided in a tidy format or alternatively in more raw form.

It also offers helper functions for working with ‘EIA’ date strings and time formats and for inspecting different summaries of series metadata.

The package also provides control over API key storage and caching of API request results.

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Encoding UTF-8

LazyData true

URL https://docs.ropensci.org/eia (website)

https://github.com/ropensci/eia

BugReports https://github.com/ropensci/eia/issues

Imports tibble, magrittr, httr, jsonlite, dplyr, purrr, memoise, lubridate, readxl

Suggests testthat, knitr, rmarkdown, covr, tidyr, ggplot2

VignetteBuilder knitr

Language en-US

RoxygenNote 7.1.0

NeedsCompilation no

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Repository CRAN

Date/Publication 2020-05-08 22:00:02 UTC
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  \begin{itemize}
    \item \textit{eia: EIA API wrapper}
  \end{itemize}
\end{itemize}

\textbf{Description}

This package provides API access to data from the US \texttt{Energy Information Administration} (EIA).

\begin{itemize}
  \item \texttt{eiadate} \hfill EIA date parsing
  \begin{itemize}
    \item \textit{EIA date parsing}
  \end{itemize}
\end{itemize}

\textbf{Description}

Helper functions for manipulating and converting between regular year-month-day date strings and EIA date string notation.

\textbf{Usage}

\begin{verbatim}
eiadate_to_date(x)

date_to_eiadate(x, date_format = c("A", "Q", "M", "W", "D", "H"))
eiadate_to_date_seq(start, end, weekly = FALSE)
\end{verbatim}

\textbf{Arguments}

\begin{itemize}
  \item \texttt{x} \hfill character, EIA date string; character or date object for regular dates. See details.
  \item \texttt{date_format} \hfill EIA date format: "A", "Q", "M", "W", "D", "H". These stand for annual, quarterly, monthly, weekly, daily, hourly. See details.
  \item \texttt{start} \hfill start EIA date or date.
  \item \texttt{end} \hfill end EIA date or date.
  \item \texttt{weekly} \hfill logical. See details.
\end{itemize}
Details

There is no reason to mix EIA date formats in this context. Functions that take EIA date strings expect a consistent format. Also, EIA date formats are parsed automatically from the dates themselves. However, daily and weekly use the same format. Too avoid ambiguity in eia_date_seq, daily is assumed; set weekly = TRUE to treat as weekly.

When providing a real date or date string, such as to date_to_eiadate, dates should be in yyyy-mm-dd format, or at least any format that can be parsed by lubridate::ymd or lubridate::ymd_hms for dates and hourly date times, respectively.

"HL" is not a supported date format. Use "H". The API does not translate the date and time when using "HL" anyhow; it simply appends the date string with the number of hours time difference.

Examples

eiadate_to_date(c("201803", "201804"))

date_to_eiadate("2018-05-14", "A")
date_to_eiadate("2018-05-14", "Q")
date_to_eiadate("2018-05-14", "M")

(x <- eiadate_to_date_seq("2018Q1", "2018Q4"))
date_to_eiadate(x, "Q")

(x <- eiadate_to_date("20190102T16Z"))
date_to_eiadate(x, "H")
(x <- eiadate_to_date_seq("20190102T16Z", "20190102T19Z"))
date_to_eiadate(x, "H")

---

### eia_cats

**EIA categories**

#### Description

Obtain EIA categories.

#### Usage

eia_cats(id = NULL, tidy = TRUE, cache = TRUE, key = eia_get_key())
eia_child_cats(id, cache = TRUE, key = eia_get_key())
eia_parent_cats(id, cache = TRUE, key = eia_get_key())

#### Arguments

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>integer, category ID. If NULL, the API root category.</td>
</tr>
<tr>
<td>tidy</td>
<td>logical, return a tidier result. See details.</td>
</tr>
<tr>
<td>cache</td>
<td>logical, cache result for duration of R session using memoization. See details.</td>
</tr>
</tbody>
</table>
key  API key: character if set explicitly; not needed if key is set globally. See `eia_set_key`.

Details

By default, additional processing is done to return a list containing tibble data frames. Set `tidy = FALSE` to return only the initial list result of `jsonlite::fromJSON`. Set `tidy = NA` to return the original JSON as a character string.

Set to `cache = FALSE` to force a new API call for updated data. Using `FALSE` always makes a new API call and returns the result from the server. `TRUE` uses memoization on a per R session basis, caching the result of the function call in memory for the duration of the R session. You can reset the entire cache by calling `eia_clear_cache`.

eia_child_cats returns only the immediate child categories. eia_parent_cats returns all parents. These are wrappers around eia_cats and always return a tibble data frame.

Value

for `eia_cats`, a list of tibble data frames (or a less processed list, or character, depending on `tidy` value); others functions return a tibble data frame.

Examples

```r
## Not run:
# use eia_set_key() to store stored API key
eia_cats()
eia_child_cats(389) # immediate children
eia_parent_cats(742) # all parents

## End(Not run)
```

---

**eia_clear_cache**

Clear API results cache

Description

Reset the results of API calls that are currently cached in memory.

Usage

`eia_clear_cache()`

`eia_clear_cats()`

`eia_clear_series()`

`eia_clear_geoset()`
Details

eia_clear_cache clears the entire cache. The other functions clear the cache associated with specific endpoints.

Examples

```r
## Not run:
key <- Sys.getenv("EIA_KEY") # your stored API key
system.time(eia_cats(key))
system.time(eia_cats(key))
eia_clear_cache()
system.time(eia_cats(key))

## End(Not run)
```

eia_geoset  

### Description

Obtain EIA geoset data.

### Usage

```r
eia_geoset(
  id,
  region,
  relation = NULL,
  start = NULL,
  end = NULL,
  n = NULL,
  tidy = TRUE,
  cache = TRUE,
  key = eia_get_key()
)
```

### Arguments

- **id**: character, geoset series ID, may be a vector. See details.
- **region**: character, region ID, may be a vector. Data available for the intersection of id and region is returned.
- **relation**: logical, make a geoset relation query instead of a geoset query. The series id is the same but is queried differently. Currently not supported, see details.
- **start**: start date. Providing only a start date will return up to the maximum 100 results if available.
- **end**: end date. Providing only an end date will a single result for that date.
n  integer, length of series to return ending at most recent value or at end date if also provided. Ignored if start is not NULL.
tidy  logical, return a tidier result. See details.
cache  logical, cache result for duration of R session using memoization. See details.
key  API key: character if set explicitly; not needed if key is set globally. See eia_set_key.

Details

id may be a vector. This should only be done with tidy = TRUE if the tidied results can be properly row bound. The geoset API calls allow multiple regions, but the API expects a single series ID. This function allows multiple series, but must make one API call per series ID. There is an expectation of similarly formatted series that can be row bound. If the IDs are for differently structured data that cannot be tidily row bound, you may as well make separate requests since each requires a unique API call either way.

By default, additional processing is done to return a tibble data frame. Set tidy = FALSE to return only the initial list result of jsonlite::fromJSON. Set tidy = NA to return the original JSON as a character string.

Set to cache = FALSE to force a new API call for updated data. Using FALSE always makes a new API call and returns the result from the server. TRUE uses memoization on a per R session basis, caching the result of the function call in memory for the duration of the R session. You can reset the entire cache by calling eia_clear_cache().

The EIA relation API endpoint is officially supported according to the online EIA API documentation, but that endpoint does not appear to function at the time of current package release.

Value

a tibble data frame (or a list, or character, depending on tidy value)

See Also

eia_clear_cache

Examples

## Not run:
# use eia_set_key() to store stored API key
id <- paste0("ELEC.GEN.ALL-99.", c("A", "Q", "M"))
region <- c("USA-CA", "USA-NY")
eia_geoset(id[1], region[1], start = 2016)
eia_geoset(id[2], region, n = 5)
eia_geoset(id[3], region[2], end = 2016, n = 5)

# multiple series counted as a single API call
x <- eia_geoset(id, region[1], end = 2016, n = 2)
x[, c("region", "data")]

# Use direct US state abbreviations or names;
# Use US Census region and division names.
x <- eia_geoset(id[2], c("AK", "New England"), end = 2016, n = 1)
x[, c("region", "data")]

## End(Not run)

---

### eia_key

---

#### Description

Set and get API key

#### Usage

```r

```eia_set_key(key, store = c("env", "options", "sysenv"))
eia_get_key(store = c("env", "options", "sysenv"))
```

#### Arguments

- **key**: character, API key.
- **store**: character, method for storing API key. See details.

#### Details

Setter and getter helpers allow you to store your EIA API key in one of three ways. Their use is optional. You can always pass the API key string to the `key` argument of any package function that requires it, but you do not have to.

By default the `key` argument for these functions is `key = eia_get_key()`. If your key has been stored in a manner that can be retrieved, then you can call all the package API functions without having to provide the key argument repeatedly.

#### Value

- `eia_get_key` returns the key string or `NULL` with a warning. `eia_set_key` returns a success message or an error.

#### Key storage methods

If you have already set your key globally somewhere using `eia_set_key`, `eia_get_key` will retrieve it. You can add the `EIA_KEY = "yourkey"` key-value pair to `options()` or as a system environment variable yourself and `eia_get_key` will pick it up as long as you use the name `EIA_KEY`. For convenience you can do this in your R session with `eia_set_key`. It gives you three options for how to store the key. The default is to use the `eia` package environment that is created when the package is loaded.
Precedence

Choose one method when setting a key. When getting the key, the three locations are checked in the order: package environment, options(), then the system environment. To override the order, specify the method explicitly and the check will only occur there. This also makes it possible to override a system level key by working with one stored in the package environment or options().

Persistence

Note that none of these three storage methods, including "sysenv" are persistent; the stored key is lost when the R session is terminated. A key that is stored outside of R as a system environment variable is retrievable with eia_get_key, just like those set in an R session with eia_set_key and store = "sysenv". However, if you truly want the key to persist as an environment variable when R terminates, you must manually add it somewhere like .Renviron; Sys.setenv in R cannot achieve this.

Examples

eia_set_key("fake")
eia_get_key()
# eia_get_key("options") returns an error if not set

---

### eia_report

**Download data for various EIA reports**

**Description**

These functions download data for various EIA reports found on the EIA website but not necessarily available through the EIA API.

**Usage**

eia_report(id, ...)

  report_drilling_productivity()

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>character, the report ID. See details for the list of available reports.</td>
</tr>
<tr>
<td>...</td>
<td>arguments passed to individual report data functions.</td>
</tr>
</tbody>
</table>

**Details**

The wrapper function and the individual report functions do not make API calls and do not require an API key.

**Value**

a list, typically a list of data frames
# eia_series

**EIA data series**

## Examples

```r
## Not run:
x <- eia_report("drilling productivity")
## End(Not run)
```

## Description

Obtain EIA data series.

## Usage

```r
eia_series(
  id,
  start = NULL,
  end = NULL,
  n = NULL,
  tidy = TRUE,
  cache = TRUE,
  key = eia_get_key()
)
```

## Arguments

- **id**: character, series ID, may be a vector.
- **start**: start date. Providing only a start date will return up to the maximum 100 results if available.
- **end**: end date. Providing only an end date will a single result for that date.
- **n**: integer, length of series to return ending at most recent value or at end date if also provided. Ignored if `start` is not `NULL`.
- **tidy**: logical, return a tidier result. See details.
- **cache**: logical, cache result for duration of R session using memoization. See details.
- **key**: API key: character if set explicitly; not needed if key is set globally. See `eia_set_key`.

## Details

By default, additional processing is done to return a tibble data frame. Set `tidy = FALSE` to return only the initial list result of `jsonlite::fromJSON`. Set `tidy = NA` to return the original JSON as a character string.

Set to `cache = FALSE` to force a new API call for updated data. Using `FALSE` always makes a new API call and returns the result from the server. `TRUE` uses memoization on a per R session basis, caching the result of the function call in memory for the duration of the R session. You can reset the entire cache by calling `eia_clear_cache()`.
Value

a tibble data frame (or a list, or character, depending on tidy value)

See Also

eia_clear_cache

Examples

```r
## Not run:
# use eia_set_key() to store stored API key
id <- paste0("ELEC.GEN.ALL-AK-99.", c("A", "Q", "M"))

x1 <- eia_series(id[1], start = 2016)
x2 <- eia_series(id[2], n = 5)
x3 <- eia_series(id[3], end = 2016, n = 5)
x1$data[[1]]
x2$data[[1]]
x3$data[[1]]

# multiple series counted as a single API call
x <- eia_series(id, end = 2016, n = 2)
x$data

## End(Not run)
```

---

**eia_series_metadata**  
EIA series metadata

Description

Make a small request to obtain a data frame containing metadata.

Usage

```r
eia_series_metadata(id, cache = TRUE, key = eia_get_key())
eia_series_updates(id, cache = TRUE, key = eia_get_key())
eia_series_dates(id, cache = TRUE, key = eia_get_key())
eia_series_range(id, cache = TRUE, key = eia_get_key())
eia_series_cats(id, tidy = TRUE, cache = TRUE, key = eia_get_key())
```
Arguments

- **id**: character, series ID, may be a vector.
- **cache**: logical, cache result for duration of R session using memoization.
- **key**: API key: character if set explicitly; not needed if key is set globally. See `eia_set_key`.
- **tidy**: logical, return a tidier result. See details.

Details

Dates are provided in `eia_series_dates` for the convenience of working with the EIA date string format; for example: maintaining order, generating sequences, computing intervals, and other operations that work well with dates but would be difficult using arbitrary strings. Keep in mind that of course these are not real dates, in the sense that you cannot map a year to a specific date.

`eia_series_updates` returns a data frame of most recent series update times for `id`. Like the other metadata helpers, this does require an API call to the series to obtain the relevant metadata. This can be useful if you are only interested in these update times for a specific set of series IDs. If you need to know the most recent update stamps for a large set of series, you should use `eia_updates` instead, which makes an API call specifically to the EIA updates endpoint for specific EIA categories by category ID.

`eia_series_cats` differs from the other functions in that it makes an API call directly to the series categories endpoint. Like other functions that return endpoint-specific output, it accepts the tidy argument for control over output structure. By default, additional processing is done to return a list containing tibble data frames. Set `tidy = FALSE` to return only the initial list result of `jsonlite::fromJSON`. Set `tidy = NA` to return the original JSON as a character string.

Value

- a tibble data frame

See Also

- `eia_updates`

Examples

```r
## Not run:
# use eia_set_key() to store stored API key
id <- paste0("ELECCONS_TOT_BTU.COW-AK-1.", c("A", "Q", "M"))

eia_series_metadata(id)
eia_series_updates(id)
eia_series_dates(id)
eia_series_range(id)
eia_series_cats(id)

## End(Not run)
```
eia_updates  

EIA data updates

Description

Obtain information on EIA data series updates for a given category to avoid having to make requests for data that have not been updated since your last request.

Usage

eia_updates(
  id = NULL,
  deep = FALSE,
  n = 50,
  start = 1,
  tidy = TRUE,
  key = eia_get_key()
)

Arguments

id  integer, category ID, may be a vector. If NULL, the API root category.
deeplogical, if TRUE, return information on all child series. If FALSE (default), return only for the category id.
n  integer, maximum number of rows of series to return. Defaults to 50; maximum permitted by the API is 10,000.
start  integer, row to start from, defaults to 1.
tidy  logical, return a tidier result. See details.
key  API key: character if set explicitly; not needed if key is set globally. See eia_set_key.

Details

This function returns paginated results of the most recent update dates for data series. n and start help with stepping through chunks.

If you need to know the most recent update stamps for a large set of series, you should use this function, which makes an API call specifically to the EIA updates endpoint for specific EIA categories by category ID. If you are only interested in update times for a specific set of series IDs, you can use eia_series_updates. Note that while this function accepts a vector of IDs for id, it must make one API call per ID.

By default, additional processing is done to return a tibble data frame. Set tidy = FALSE to return only the initial list result of jsonlite::fromJSON. Set tidy = NA to return the original JSON as a character string.
Value

a tibble data frame (or a list, or character, depending on tidy value)

See Also

eia_series_updates

Examples

```r
## Not run:
# use eia_set_key() to store stored API key
eia_updates(742, n = 5)

## End(Not run)
```
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