Package ‘finnishgrid’

June 5, 2024

Type Package

Title 'Fingrid Open Data API' R Client

Version 0.2.0

Description R API client package for 'Fingrid Open Data'

<https://data.fingrid.fi/> on the electricity market and the power system.

get_data() function holds the main application logic to retrieve
time-series data. API calls require free user account registration.

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URL https://github.com/virmar/finnishgrid

BugReports https://github.com/virmar/finnishgrid/issues

Encoding UTF-8

Imports httr, jsonlite

Suggests rmarkdown, knitr, testthat (>= 3.0.0)

Config/testthat/edition 3

RoxygenNote 7.3.1

VignetteBuilder knitr

NeedsCompilation no

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**afrr_activated_down**

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. Hourly values can be found correctly on the European transparency platform: https://transparency.entsoe.eu/balancing/r2/activationAndActivatedBalancingReserves/showActivated automatic Frequency Restoration Reserve (aFRR) energy, down (MW). Value is activated average power. The amount of activated Automatic Frequency. The Data before 13.06.2023 is in hourly resolution.

**Usage**

```r
afrr_activated_down(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

**Arguments**

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 15 min and unit type MW.

**See Also**

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- afrr_activated_up(start_time_utc = start,
                        end_time_utc = end,
                        user_key = key)
summary(df)
## End(Not run)
```

---

`afrr_activated_up`  
**Automatic Frequency Restoration Reserve, activated, up**

Description

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. Hourly values can be found correctly on the European transparency platform: https://transparency.entsoe.eu/balancing/r2/activationAndActivatedBalancingReserves/showActivated automatic Frequency Restoration Reserve (aFRR) energy, down (MW). Value is activated average power. The amount of activated Automatic Frequency Restoration Reserve (aFRR) is calculated based on the activation signal and reserve capacity maintained in Finland. The average shown every quarter is the average of the past quarter, i.e. the value coming with a time stamp of 14:15 is the average from 14:00-14:15. The Data before 13.06.2023 is in hourly resolution.

Usage

```r
afrr_activated_up(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/54
### Description

Procured automatic Frequency Restoration Reserve (aFRR) capacity, down (MW)

### Usage

```r
afrr_capacity_down(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

### Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

### Value

A data frame object with time series data having period 1 h and unit type MW.

### See Also

https://data.fingrid.fi/en/datasets/2

### Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- afrr_capacity_down(start_time_utc = start,
                        end_time_utc = end,
                        user_key = key)
summarize(df)
```

```r
## End(Not run)
```
**afrr_capacity_up**  

Automatic Frequency Restoration Reserve, capacity, up

**Description**

Procured automatic Frequency Restoration Reserve (aFRR) capacity, up (MW)

**Usage**

```r
afrr_capacity_up(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

**Arguments**

- `start_time_utc`  
  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`  
  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`  
  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/1

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- afrr_capacity_up(start_time_utc = start, end_time_utc = end, user_key = key)
summary(df)
```

## End(Not run)
Description

Marginal price for procured automatic Frequency Restoration Reserve (aFRR) capacity for down-regulation (/MW)

Usage

afrr_price_down(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MW.

See Also

https://data.fingrid.fi/en/datasets/51

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- afrr_price_down(start_time_utc = start,
                   end_time_utc = end,
                   user_key = key)
summary(df)

## End(Not run)
afrr_price_up

Automatic Frequency Restoration Reserve, price, up

Description

Marginal price for procured upward automatic Frequency Restoration Reserve (aFRR) capacity (/MW)

Usage

afrr_price_up(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MW.

See Also

https://data.fingrid.fi/en/datasets/52

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
der = "2024-06-03T00:00:00.000Z"  # UTC
dkey = "MY_SUPER_SECRET"
df <- afrr_price_up(start_time_utc = start,
            end_time_utc = end,
            user_key = key)
summary(df)

## End(Not run)
border_commercial_electricity_flow_FI_EE

Commercial transmission of electricity between FI-EE

Description

Commercial electricity flow (dayahead market and intraday market) between Finland (FI) and Estonia (EE) including system supportive trade between TSOs. Positive sign is export from Finland to Estonia.

Usage

```r
border_commercial_electricity_flow_FI_EE(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/140

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_commercial_electricity_flow_FI_EE(start_time_utc = start, end_time_utc = end, user_key = key)
summary(df)
## End(Not run)
```
border_commercial_electricity_flow_FI_SE1

Commercial transmission of electricity between FI-SE1

Description

Commercial transmission of electricity (dayahead market and intraday market) between Finland (FI) and Northern Sweden (SE1). Positive sign is export from Finland to Sweden.

Usage

```r
border_commercial_electricity_flow_FI_SE1(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/31

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_commercial_electricity_flow_FI_SE1(start_time_utc = start,
                                               end_time_utc = end,
                                               user_key = key)
summary(df)

## End(Not run)
```


border_commercial_electricity_flow_FI_SE3

Commercial transmission of electricity between FI-SE3

Description

Commercial electricity flow (dayahead market and intraday market) between Finland (FI) and Central Sweden (SE3). Positive sign is export from Finland to Sweden.

Usage

\[
\text{border_commercial_electricity_flow_FI_SE3}(\text{start_time_utc} = \text{NA}, \text{end_time_utc} = \text{NA}, \text{user_key} = \text{NA})
\]

Arguments

- \text{start_time_utc}: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- \text{end_time_utc}: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- \text{user_key}: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/32

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_commercial_electricity_flow_FI_SE3(start_time_utc = start,
                                                end_time_utc = end,
                                                user_key = key)
summary(df)
## End(Not run)
```
**border_da_trans_cap_EE_FI_official**

*Day-ahead transmission capacity EE-FI - official*

---

**Description**

Day-ahead transmission capacity from Estonia (EE) to Finland (FI). Transmission capacity is given hourly for every hour of the next day. Each hour is given one value. Day-ahead transmission capacity Fingrid will publish every day in the afternoon. This capacity will not changed after publication. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

**Usage**

```r
border_da_trans_cap_EE_FI_official(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

**Arguments**

- `start_time_utc` - Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` - End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` - Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/112

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_da_trans_cap_EE_FI_official(start_time_utc = start,
                                         end_time_utc = end,
                                         user_key = key)
summary(df)

## End(Not run)
```
border_da_trans_cap_FI_EE_official

Day-ahead transmission capacity FI-EE - official

Description

Day-ahead transmission capacity from Finland (FI) to Estonia (EE). Transmission capacity is given hourly for every hour of the next day. Each hour is given one value. Day-ahead transmission capacity Fingrid will publish every day in the afternoon. This capacity will not changed after publication. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

Usage

```r
border_da_trans_cap_FI_EE_official(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_da_trans_cap_FI_EE_official(start_time_utc = start,
                                         end_time_utc = end,
                                         user_key = key)
summary(df)
```

## End(Not run)
Description

Day-ahead transmission capacity from Finland (FI) to North-Sweden (SE1). Transmission capacity is given hourly for every hour of the next day. Each hour is given one value. Day-ahead transmission capacity Fingrid will publish every day in the afternoon. This capacity will not changed after publication. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

Usage

border_da_trans_cap_FI_SE1_official(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/26

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- border_da_trans_cap_FI_SE1_official(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)
summary(df)

## End(Not run)
border_da_trans_cap_FI_SE1_planned

Day-ahead transmission capacity FI-SE1 - planned

Description

Planned day-ahead transmission capacity from Finland (FI) to North-Sweden (SE1). Transmission capacity is given hourly for every next week hour. Each week’s hour is given one value. Planned weekly transmission capacity Fingrid will publish every Tuesday. Information will be updated if there are changes to the previous plan timetable or capacity. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

Usage

```r
border_da_trans_cap_FI_SE1_planned(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/143

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"

df <- border_da_trans_cap_FI_SE1_planned(start_time_utc = start,
                                         end_time_utc = end,
                                         user_key = key)
summary(df)

## End(Not run)
```
**border_da_trans_cap_FI_SE3_official**

*Day-ahead transmission capacity FI-SE3 - official*

**Description**
Day-ahead transmission capacity from Finland (FI) to Central-Sweden (SE3). Transmission capacity is given hourly for every hour of the next day. Each hour is given one value. Day-ahead transmission capacity Fingrid will publish every day in the afternoon. This capacity will not changed after publication. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

**Usage**
```r
border_da_trans_cap_FI_SE3_official(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**
- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**
A data frame object with time series data having period 1 h and unit type MW.

**See Also**

**Examples**
```r
### Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_da_trans_cap_FI_SE3_official(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)
summary(df)
```

### End(Not run)
border_da_trans_cap_FI_SE3_planned

Day-ahead transmission capacity FI-SE3 - planned

Description

Planned day-ahead transmission capacity from Finland (FI) to Central-Sweden (SE3). Transmission capacity is given hourly for every next week hour. Each week’s hour is given one value. Planned weekly transmission capacity Fingrid will publish every Tuesday. Information will be updated if there are changes to the previous plan timetable or capacity. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

Usage

```r
border_da_trans_cap_FI_SE3_planned(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- border_da_trans_cap_FI_SE3_planned(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)
summary(df)

## End(Not run)
```
border_da_trans_cap_SE1_FI_official

*Day-ahead transmission capacity SE1-FI - official*

**Description**

Day-ahead transmission capacity from North-Sweden (SE1) to Finland (FI). Transmission capacity is given hourly for every hour of the next day. Each hour is given one value. Day-ahead transmission capacity Fingrid will publish every day in the afternoon. This capacity will not changed after publication. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

**Usage**

```r
border_da_trans_cap_SE1_FI_official(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/24

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_da_trans_cap_SE1_FI_official(start_time_utc = start,
                                         end_time_utc = end,
                                         user_key = key)
summary(df)
```

## End(Not run)
Day-ahead transmission capacity SE1-FI - planned

Description

Planned day-ahead transmission capacity from North-Sweden (SE1) to Finland (FI). Transmission capacity is given hourly for every next week hour. Each week’s hour is given one value. Planned weekly transmission capacity Fingrid will publish every Tuesday. Information will be updated if there are changes to the previous plan timetable or capacity. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

Usage

```r
border_da_trans_cap_SE1_FI_planned(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/142

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_da_trans_cap_SE1_FI_planned(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)
```

## End(Not run)
Description

Day-ahead transmission capacity from Central-Sweden (SE3) to Finland (FI). Transmission capacity is given hourly for every hour of the next day. Each hour is given one value. Day-ahead transmission capacity Fingrid will publish every day in the afternoon. This capacity will not changed after publication. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

Usage

```r
border_da_trans_cap_SE3_FI_official(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_da_trans_cap_SE3_FI_official(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)
```

## End(Not run)
border_da_trans_cap_SE3_FI_planned

Day-ahead transmission capacity SE3-FI - planned

Description

Planned day-ahead transmission capacity from Central-Sweden (SE3) to Finland (FI). Transmission capacity is given hourly for every next week hour. Each week’s hour is given one value. Planned weekly transmission capacity Fingrid will publish every Tuesday. Information will be updated if there are changes to the previous plan timetable or capacity. Transmission capacity mean the capability of the electricity system to supply electricity to the market without compromising the system security.

Usage

```r
border_da_trans_cap_SE3_FI_planned(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/144

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
A <- border_da_trans_cap_SE3_FI_planned(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
supply(df)
## End(Not run)
```
**border_id_trans_cap_EE_FI**

Intraday transmission capacity EE-FI

**Description**

Transmission capacity to be given to intraday market EE-FI

**Usage**

```r
border_id_trans_cap_EE_FI(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/110

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_id_trans_cap_EE_FI(start_time_utc = start,
                               end_time_utc = end,
                               user_key = key)
summary(df)
```

## End(Not run)
Intraday transmission capacity EE-FI - real time data

Description

Transmission capacity to be given to intraday market EE-FI. After Elspot trades have been closed, real time intraday capacity is equivalent to the allocated intraday capacity. The real time capacity is updated after each intraday trade so that it corresponds to real time situation.

Usage

```r
border_id_trans_cap_EE_FI_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/111

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_id_trans_cap_EE_FI_RTD(start_time_utc = start, end_time_utc = end, user_key = key)
summarize(df)
## End(Not run)```
border_id_trans_cap_FI_EE

Intraday transmission capacity FI-EE

Description

Transmission capacity to be given to intraday market FI-EE

Usage

```r
border_id_trans_cap_FI_EE(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/113

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_id_trans_cap_FI_EE(start_time_utc = start,
                                 end_time_utc = end,
                                 user_key = key)
summary(df)
## End(Not run)
```
border_id_trans_cap_FI_EE_RTD

Intraday transmission capacity FI-EE - real time data

Description

Transmission capacity to be given to intraday market FI-EE. After Elspot trades have been closed, real time intraday capacity is equivalent to the allocated intraday capacity. The real time capacity is updated after each intraday trade so that it corresponds to real time situation.

Usage

```r
border_id_trans_cap_FI_EE_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_id_trans_cap_FI_EE_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
border_id_trans_cap_FI_SE1

Intraday transmission capacity FI - SE1

Description

Transmission capacity for intraday market from Finland to Northern Sweden (FI - SE1). For intraday market capacity is given as free capacity after dayahead market. Capacity is published once a day and not updated.

Usage

```r
border_id_trans_cap_FI_SE1(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`   End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`    Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/44

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- border_id_trans_cap_FI_SE1(start_time_utc = start,
                                  end_time_utc = end,
                                  user_key = key)
summary(df)
## End(Not run)
```
border_id_trans_cap_FI_SE3

Intraday transmission capacity FI-SE3

Description

Transmission capacity for intraday market from Finland to Mid Sweden (FI - SE3). For intraday market capacity is given as free capacity after dayahead market. Capacity is published once a day and not updated.

Usage

```r
border_id_trans_cap_FI_SE3(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- border_id_trans_cap_FI_SE3(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
## End(Not run)
```
**border_id_trans_cap_SE1_FI**

*Intraday transmission capacity SE1-FI*

**Description**

Transmission capacity for intraday market from Northern Sweden to Finland (SE1-FI). For intraday market capacity is given as free capacity after dayahead market. Capacity is published once a day and not updated.

**Usage**

```r
border_id_trans_cap_SE1_FI(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc`  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MW.

**See Also**


**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- border_id_trans_cap_SE1_FI(start_time_utc = start,
                                  end_time_utc = end,
                                  user_key = key)
summary(df)
## End(Not run)
```
Description

Transmission capacity for intraday market from Mid Sweden to Finland (SE3-FI). Capacity for intraday market is given as free capacity after dayahead market. Capacity is published once a day and not updated.

Usage

```r
border_id_trans_cap_SE3_FI(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_id_trans_cap_SE3_FI(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
```

## End(Not run)
Transmission of electricity between Finland and Estonia

Description

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. Average data can be found correctly on the European transparency platform: https://transparency.entsoe.eu/transmission-domain/physicalFlow/show Measured electrical transmission between Finland and Estonia HVDC tile lines (Estlink 1 and Estlink 2). Positive sign means transmission from Finland to Estonia. Negative sign means transmission from Estonia to Finland. The value is updated once every 15 minutes after the hour shift. Each day before noon the values of the previous day are updated with more accurate measurement values. The average shown every quarter is the average of the past quarter, i.e. the value coming with a time stamp of 14:15 is the average from 14:00-14:15. The Data before 13.06.2023 is in hourly resolution.

Usage

```r
border_measured_electricity_flow_FI_EE(  
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- border_measured_electricity_flow_FI_EE(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)
```
border_measured_electricity_flow_FI_NO

Transmission of electricity between Finland and Norway

Description

The values in the data have been erroneously instantaneous values. The data will be corrected to a 15-minute average. We’ll let you know when the fix is done. Average data can be found correctly on the European transparency platform: https://transparency.entsoe.eu/transmission-domain/physicalFlow/showMeasured electrical transmission between Finland and Norway 220kV tie line. Positive sign means transmission from Finland to Norway. Negative sign means transmission from Norway to Finland. The value is updated once every 15 minutes after the hour shift. Each day before noon the values of the previous day are updated with more accurate measurement values. The Data before 13.06.2023 is in hourly resolution.

Usage

border_measured_electricity_flow_FI_NO(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_measured_electricity_flow_FI_NO(start_time_utc = start,
    user_key = key)
summary(df)
```

## End(Not run)

---

**border_measured_electricity_flow_FI_SE1**

*Transmission of electricity between Finland and Northern Sweden - measured every 15 minutes*

---

**Description**

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. Average data can be found correctly on the European transparency platform: [https://transparency.entsoe.eu/transmission-domain/physicalFlow/showMeasured](https://transparency.entsoe.eu/transmission-domain/physicalFlow/showMeasured) transmission of electricity between Finland and Northern Sweden (SE1). Positive sign means transmission from Finland to Northern Sweden (SE1). Negative sign means transmission from Northern Sweden (SE1) to Finland. The average shown every quarter is the average of the past quarter, i.e. the value coming with a time stamp of 14:15 is the average from 14:00-14:15. The Data before 13.06.2023 is in hourly resolution.

**Usage**

```r
border_measured_electricity_flow_FI_SE1(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

**Arguments**

- **start_time_utc** Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc** End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key** Character array holding API-key. Free from [https://data.fingrid.fi/en/instructions](https://data.fingrid.fi/en/instructions)

**Value**

A data frame object with time series data having period 15 min and unit type MWh/h.
### border_measured_electricity_flow_FI_SE3

**Transmission of electricity between Finland and Central Sweden - measured every 15 minutes**

**Description**

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. Average data can be found correctly on the European transparency platform: https://transparency.entsoe.eu/transmission-domain/physicalFlow/showMeasured transmission of electricity between Finland and Central Sweden (SE3). Positive sign means transmission from Finland to Central Sweden (SE3). Negative sign means transmission from Northern Sweden (SE1) to Finland. The average shown every quarter is the average of the past quarter, i.e. the value coming with a time stamp of 14:15 is the average from 14:00-14:15. The Data before 13.06.2023 is in hourly resolution.

**Usage**

```r
border_measured_electricity_flow_FI_SE3(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc`  Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`  End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions
**Value**

A data frame object with time series data having period 15 min and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/61

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- border_measured_electricity_flow_FI_SE3(start_time_utc = start,
                        end_time_utc = end,
                        user_key = key)
summary(df)
## End(Not run)
```

---

**congestion_income_FI_EE**

*Congestion income between FI-EE*

**Description**

Congestion income between Finland (FI) and Estonia (EE). Congestion income is published on ENTSO-E’s Transparency Platform, which can be founded here: https://transparency.entsoe.eu/transmission/r2/dailyImplicitAllocationsCongestionIncome/show. There are historical values to be found from Open Data until the beginning of February 2017. After February 2017 updated data as well as historical data can be founded from ENTSO-E’s Transparency Platform. Congestion income is calculated as follows: congestion income (/h) = commercial flow on day ahead market (MW) * area price difference (/MWh). Congestion originates in the situation where transmission capacity between bidding zones is not sufficient to fulfill the market demand and the congestion splits the bidding zones into separate price areas. Congestion income arises from the different prices that the sellers receive and the buyers pay when electricity flows from the higher price area to the lower price area. The power exchange receives the difference, which it then pays to the Transmission System Operators (TSOs). The TSOs spend the received congestion income on increasing the transmission capacity on its cross-border interconnectors according to the EU regulation.

**Usage**

```r
congestion_income_FI_EE(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```
Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- congestion_income_FI_SE1(start_time_utc = start,
                                 end_time_utc = end,
                                 user_key = key)
summary(df)
## End(Not run)
```

Description

Congestion income between Finland (FI) and Northern Sweden (SE1). Congestion income is published on ENTSO-E’s Transparency Platform, which can be founded here: https://transparency.entsoe.eu/transmission/r2/data . There are historical values to be found from Open Data until the beginning of February 2017. After February 2017 updated data as well as historical data can be founded from ENTSO-E’s Transparency Platform. Congestion income is calculated as follows: congestion income (/h) = commercial flow on day ahead market (MW) * area price difference (/MWh)

Congestion originates in the situation where transmission capacity between bidding zones is not sufficient to fulfill the market demand and the congestion splits the bidding zones into separate price areas. Congestion income arises from the different prices that the sellers receive and the buyers pay when electricity flows from the higher price area to the lower price area. The seller acting in a lower price area receives lower price for electricity compared to the price the other party pays for electricity in the higher price area, and the power exchange receives surplus income, which it then pays to the Transmission System Operators (TSOs). The TSOs spend the received congestion income on increasing the transmission capacity on its cross-border interconnectors according to the EU regulation.
Usage

congestion_income_FI_SE1(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR.

See Also

https://data.fingrid.fi/en/datasets/70

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- congestion_income_FI_SE1(start_time_utc = start,
end_time_utc = end,
user_key = key)
summary(df)
## End(Not run)
receives lower price for electricity compared to the price the other party pays for electricity in the higher price area, and the power exchange receives surplus income, which it then pays to the Transmission System Operators (TSOs). The TSOs spend the received congestion income on increasing the transmission capacity on its cross-border interconnectors according to the EU regulation.

Usage

congestion_income_FI_SE3(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR.

See Also

https://data.fingrid.fi/en/datasets/71

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- congestion_income_FI_SE3(start_time_utc = start,
                                   end_time_utc = end,
                                   user_key = key)
summary(df)
## End(Not run)
```

**electricity_consumption_FI**

*Electricity consumption in Finland*

Description

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. Average data can be found correctly on the European transparency platform: https://transparency.entsoe.eu/load-domain/r2/totalLoadR2/showElectricity consumption in Finland is based on Fingrid’s production measurements. Minor part of production
which is not measured is estimated. The consumption is calculated as follows: Consumption = Production + Import - Export. The average shown every quarter is the average of the past quarter, i.e. the value coming with a time stamp of 14:15 is the average from 14:00-14:15. The Data before 13.06.2023 is in hourly resolution.

Usage

electricity_consumption_FI(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- electricity_consumption_FI(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)
## End(Not run)
```

---

electricity_consumption_forecast_FI

*Electricity consumption forecast*

**Description**

Electricity consumption forecast of Finland. The forecast is made by Fingrid. The Data before 21.04.2024 is in 5 minute resolution.
Usage

```r
electricity_consumption_forecast_FI(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/166

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"

df <- electricity_consumption_forecast_FI(start_time_utc = start,
                                        end_time_utc = end,
                                        user_key = key)

summary(df)
## End(Not run)
```

Description

A consumption forecast for the next 24 hours made by Fingrid. Forecast is published on previous day at 12:00 EET. The Data before 21.04.2024 is in 5 minute resolution.
Usage

electricity_consumption_forecast_FI_DA(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/165

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- electricity_consumption_forecast_FI_DA(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)
summary(df)

## End(Not run)

electricity_production_FI

Electricity production in Finland

Description

The values in the data have been erroneously instantaneous values. From February 21, 2024, the
data are correct 15-minute averages. Average data can be found correctly on the European trans-
parency platform: https://transparency.entsoe.eu/generation/r2/actualGenerationPerProductionType/show
Electricity production in Finland are based on Fingrid’s measurements. Minor part of production
which is not measured is estimated. The average shown every quarter is the average of the past quar-
ter, i.e. the value coming with a time stamp of 14:15 is the average from 14:00-14:15. The Data
before 13.06.2023 is in hourly resolution.
Usage

electricity_production_FI(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/74

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- electricity_production_FI(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
## End(Not run)

description

electricity_production_forecast15_FI_DA

Electricity production prediction - updated every 15 minutes

Description

The calculation of production forecast in Finland is based on the production plans that balance responsible parties has reported to Fingrid. Production forecast is updated every 15 minutes. The Data before 03.06.2023 is in hourly resolution.
Usage

electricity_production_forecast15_FI_DA(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- electricity_production_forecast15_FI_DA(start_time_utc = start,
                                             end_time_utc = end,
                                             user_key = key)
summary(df)

## End(Not run)

---

**electricity_production_forecast_FI_DA**

*Electricity production prediction - premilinary*

Description

15 minutes electricity generation forecast is based on the production plans that balance responsible parties have reported to Fingrid. The forecast is published daily by 6:00 pm for the next day, and it is not updated to match the updated production plans that balance responsible parties send to Fingrid. The Data before 10.06.2023 is in hourly resolution.
Usage

electricity_production_forecast_FI_DA(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

  start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
  end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
  user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also


Examples

  ## Not run:
  library(finnishgrid)
  start = "2024-06-01T00:00:00.000Z"  # UTC
  end = "2024-06-03T00:00:00.000Z"  # UTC
  key = "MY_SUPER_SECRET"
  df <- electricity_production_forecast_FI_DA(start_time_utc = start,
                                               end_time_utc = end,
                                               user_key = key)
  summary(df)
  ## End(Not run)

electricity_solar_pwr_production_forecast_daily_upd

Solar power generation forecast - updated once a day

Description

Solar power generation forecasts for the next day. Forecast is updated every day at 12 p.m. EET. Length of the forecast is 36 hours. Overlapping hours are overwritten. Solar forecasts are based on weather forecasts and estimates of installed PV capacity and location in Finland. Total PV capacity is based on yearly capacity statistics from the Finnish energy authority and estimates on installation rate of new capacity. Location information is a very rough estimate based on Finnish distribution grid operators information. The Data before 28.03.2024 is in hourly resolution.
Usage

```r
electricity_solar_pwr_production_forecast_daily_upd(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- electricity_solar_pwr_production_forecast_daily_upd(start_time_utc = start,
                                                         end_time_utc = end,
                                                         user_key = key)
summary(df)
## End(Not run)
```

---

electricity_solar_pwr_production_forecast_quart_upd

*Solar power generation forecast - updated every 15 minutes*

Description

Solar power generation forecast for the next 36 hours. Updated every 15 minutes. Solar forecasts are based on weather forecasts and estimates of installed PV capacity and location in Finland. Total PV capacity is based on yearly capacity statistics from the Finnish energy authority and estimates on installation rate of new capacity. Location information is a very rough estimate based on Finnish distribution grid operators information. The Data before 31.05.2023 is in hourly resolution.
Usage

```r
electricity_solar_pwr_production_forecast_quart_upd(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- electricity_solar_pwr_production_forecast_quart_upd(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)
## End(Not run)
```

declaration

### Description

This is the total solar power production capacity used in Fingrid’s solar power forecast. It is based on the small scale production statistics gathered by the Energy authority. It is also updated with estimates based on information that’s provided to Fingrid. This total capacity information can be used, for example, to calculate the rate of production of solar power, by comparing it to the forecasted solar production series by Fingrid. This capacity information cannot however be considered as the official amount of solar production capacity in Finland, as it is updated manually and by using estimates.
Usage

```r
electricity_solar_pwr_total_cap(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc`  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- electricity_solar_pwr_total_cap(start_time_utc = start,
end_time_utc = end,
user_key = key)
summary(df)
## End(Not run)
```

description

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. The older average data can be found correctly on the European transparency platform: https://transparency.entsoe.eu/generation/r2/actualGenerationPerProductionType/showFinnish 15 min wind power generation is a sum of measurements from wind parks supplied to Fingrid and of the estimate Fingrid makes from non-measured wind parks. Non-measured wind parks are about two percent of the production capacity. The average shown every quarter is the average of the past quarter, i.e. the value coming with a time stamp of 14:15 is the average from 14:00-14:15. The Data before 13.06.2023 is in hourly resolution.
Usage

```r
electricity_wind_pwr_production(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/75

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- electricity_wind_pwr_production(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)

## End(Not run)
```

Description

Finnish wind power generation forecasts for the next day. Forecast is updated every day at 12 p.m. EET. Length of the forecast is 36 hours. Overlapping hours are overwritten. The forecast is based on weather forecasts and data about the location, size and capacity of wind turbines. The weather data sourced from multiple providers. The Data before 28.03.2024 is in hourly resolution.
electricity_wind_pwr_production_forecast_quart_upd

Usage

```r
electricity_wind_pwr_production_forecast_daily_upd(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/246

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- electricity_wind_pwr_production_forecast_daily_upd(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```

electricity_wind_pwr_production_forecast_quart_upd

Wind power generation forecast - updated every 15 minutes

Description

Finnish wind power generation forecast for the next 36 hours. Updated every 15 minutes. The forecast is based on weather forecasts and data about the location, size and capacity of wind turbines. The weather data sourced from multiple providers. The Data before 31.05.2023 is in hourly resolution.
electricity_wind_pwr_total_cap

Usage

```r
electricity_wind_pwr_production_forecast_quart_upd(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/245

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- electricity_wind_pwr_production_forecast_quart_upd(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)
## End(Not run)
```

electricity_wind_pwr_total_cap

Total production capacity used in the wind power forecast

Description

This is the total wind production capacity used in Fingrid’s wind power forecast. It is based on capacity information gathered by Fingrid. This total capacity information can be used, for example, to calculate the rate of production of wind power, by comparing it to the actual wind production series by Fingrid. This capacity information cannot however be considered as the official amount of wind production capacity in Finland, as it is updated manually.
Usage

electricity_wind_pwr_total_cap(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- electricity_wind_pwr_total_cap(start_time_utc = start,
                                   end_time_utc = end,
                                   user_key = key)
summary(df)
```

esg_emission_factor_elec_consumption_FI_RTD

Emission factor for electricity consumed in Finland - real time data

Description

Estimate of carbon dioxide of produced electricity, which is consumed in Finland. The emissions are estimated by taking Finland’s electricity production, electricity import as well as electricity export into account. The data is updated every 3 minutes.
Usage

esg_emission_factor_elec_consumption_FI_RTD(
   start_time_utc = NA,
   end_time_utc = NA,
   user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type gCO2/kWh.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- esg_emission_factor_elec_consumption_FI_RTD(start_time_utc = start,
   end_time_utc = end,
   user_key = key)
summary(df)
## End(Not run)

Emission factor of electricity production in Finland - real time data

Description

Near in real time calculated carbon dioxide emission estimate of electricity production in Finland. The emissions are estimated by summing each product of different electricity production type and their emission factor together, and by dividing the sum by Finland’s total electricity production. The data is updated every 3 minutes.
Usage

```r
esg_emission_factor_elec_production_FI_RTD(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type gCO2/kWh.

See Also

https://data.fingrid.fi/en/datasets/266

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- esg_emission_factor_elec_production_FI_RTD(start_time_utc = start,
                                                end_time_utc = end,
                                                user_key = key)
summary(df)

## End(Not run)
```

Description

The volume of received frequency containment reserve for disturbances downwards regulation (FCR-D down) bids. The volume of bids will be published 22:00 (EET) on previous evening. FCR-D downwards regulation is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency below 50.5 Hz during disturbances.
Usage

```r
cfr_d_hourlymarket_bidsum_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- fcr_d_hourlymarket_bidsum_down(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```

Description

The volume of received frequency containment reserve for disturbances upwards regulation (FCR-D up) bids. The volume of bids will be published 22:45 (EET) on previous evening. FCR-D (up) is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency above 49.5 Hz during disturbances. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.
Usage

fcr_d_hourlymarket_bidsum_up(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"

df <- fcr_d_hourlymarket_bidsum_up(start_time_utc = start,
                                    end_time_utc = end,
                                    user_key = key)

summary(df)

## End(Not run)

fcr_d_hourlymarket_prices_down

Frequency containment reserves for disturbances downwards regulation, hourly market prices

Description

Hourly prices (/MW,h) of procured frequency containment reserve for disturbances downwards regulation (FCR-D down) in Finnish hourly market for each CET-timezone day is published previous evening at 22:45 (EET). FCR-D down is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency below 50.5 Hz during disturbances. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.
Usage

fcr_d_hourlymarket_prices_down(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type €/MW.

See Also

https://data.fingrid.fi/en/datasets/283

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY SUPER SECRET"
df <- fcr_d_hourlymarket_prices_down(start_time_utc = start,
                                      end_time_utc = end,
                                      user_key = key)
summary(df)
## End(Not run)
```

fcr_d_hourlymarket_prices_up

Frequency containment reserves for disturbances upwards regulation, hourly market prices

Description

Hourly prices (/MW,h) of procured frequency containment reserve for disturbances upwards regulation (FCR-D up) in Finnish hourly market for each CET-timezone day is published previous evening at 22:45 (EET). FCR-D (up) is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency above 49,5 Hz during disturbances. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.
Usage

```r
fcr_d_hourlymarket_prices_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.

Value

A data frame object with time series data having period 1 h and unit type EUR/MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- fcr_d_hourlymarket_prices_up(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```

Description

Hourly volume of procured frequency containment reserve for disturbances downwards regulation (FCR-D down) in Finnish hourly market for each CET-timezone day is published previous evening at 22:45 (EET). FCR-D downwards regulation is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency below 50.5 Hz during disturbances. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.
Usage

fcr_d_hourlymarket_procured_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc   End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key       Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.00Z"  # UTC
end = "2024-06-03T00:00:00.00Z"  # UTC
key = "MY_SUPER_SECRET"
df <- fcr_d_hourlymarket_procured_down(start_time_utc = start,
                           end_time_utc = end,
                           user_key = key)
summary(df)
## End(Not run)

---

fcr_d_hourlymarket_procured_up

Frequency containment reserve for disturbances upwards regulation,
procured volumes in hourly market

Description

Hourly volume of procured frequency containment reserve for disturbances upwards regulation
(FCR-D up) in Finnish hourly market for each CET-timezone day is published previous evening at
22:45 (EET). FCR-D (up) is the frequency containment reserve used in the Nordic synchronous sys-
tem that aims to keep the frequency above 49.5 Hz during disturbances. Hourly market is a reserve
market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most
expensive procured bid.
Usage

```r
fcr_d_hourlymarket_procured_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
cr = "MY_SUPER_SECRET"
fe <- fcr_d_hourlymarket_procured_up(start_time_utc = start,
  end_time_utc = end,
  user_key = dc
)summary(df)
## End(Not run)
```

Description

The volume of the Nordic trade of frequency containment reserve for disturbances downward regulation (FCR-D down) capacity. Positive numbers indicate import of capacity to Finland and negative numbers indicate export of capacity from Finland. The data contains the traded capacity for Sweden and Norway. The data will be published 22:45 (EET) on previous evening. FCR-D down is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency below 50.5 Hz during disturbances. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.
Usage

fcr_d_nordictrade_down(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/320

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- fcr_d_nordictrade_down(start_time_utc = start,
   end_time_utc = end,
   user_key = key)
summary(df)
## End(Not run)

---

fcr_d_nordictrade_up  Frequency containment reserves for disturbances upwards regulation, nordic trade

Description

The volume of the nordic trade of frequency containment reserve for disturbances upwards regulation (FCR-D up) capacity. Positive numbers indicate import of capacity to Finland and negative numbers indicate export of capacity from Finland. The data contains the traded capacity for Sweden and Norway. The data will be published 22:45 (EET) on previous evening. FCR-D (up) is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency above 49.5 Hz during disturbances. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.

Usage

fcr_d_nordictrade_up(start_time_utc = NA, end_time_utc = NA, user_key = NA)
Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/289

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- fcr_d_nordictrade_up(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)

## End(Not run)
fcr_d_yearlymarket_plans_up

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- fcr_d_yearlymarket_plans_down(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
supply(df)
## End(Not run)

fcr_d_yearlymarket_plans_up

Frequency containment reserves for disturbances upwards regulation, reserve plans in the yearly market

Description

The hourly sum of reserve plans for frequency containment reserve for disturbances upwards regulation (FCR-D up) in the yearly market. The data will be published 22:45 (EET) on previous evening. FCR-D (up) is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency above 49.5 Hz during disturbances. Yearly market is a reserve market operated by Fingrid. Hourly procured volumes vary according to the reserve plans submitted by the balancing service providers and the price is constant over the whole year.

Usage

fcr_d_yearlymarket_plans_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/290

Examples

```r
## Not run:
library(finnishgrid)
start = \"2024-06-01T00:00:00.000Z\" # UTC
der = \"2024-06-03T00:00:00.000Z\" # UTC
key = \"MY_SUPER_SECRET\"
df <- fcr_d_yearlymarket_plans_up(start_time_utc = start,
                                 end_time_utc = end,
                                 user_key = key)
summary(df)
## End(Not run)
```

Description

The values in the data have been erroneously instantaneous values. From February 21, 2024, the data are correct 15-minute averages. Hourly values can be found correctly on the European transparency platform: https://transparency.entsoe.eu/balancing/r2/activationAndActivatedBalancingReserves/show Activated Frequency Containment Reserve for Normal operation (FCR-N) is published one hour after the hour in question, for example the value for hour 07-08 is published at 9 o’clock. FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Activated FCR-N volume (MWh) is calculated on the basis of the frequency in the Nordic synchronous system and maintained Finnish FCR-N capacity. Value is activated net average power. Positive value means that the frequency has been in average below 50.0 Hz during the hour, and reserve has been activated as up-regulation. Respectively, negative value means that the frequency has been in average above 50.0 Hz, and reserve has been activated as down-regulation. The Data before 13.06.2023 is in hourly resolution.

Usage

```r
fcr_n_activated(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```
fcr_n_activated_down

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 15 min and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/123

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- fcr_n_activated(start_time_utc = start,
                   end_time_utc = end,
                   user_key = key)
summary(df)
## End(Not run)
```

fcr_n_activated_down  Frequency Containment Reserve for Normal operation, activated down-regulation

Description

FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Activated FCR-N volume down (MW) is calculated on the basis of the frequency in the Nordic synchronous system and maintained Finnish FCR-N capacity. Value is the average activated down-regulation power. Negative value means that the frequency has been above 50.0 Hz. and reserve has been activated as down-regulation.

Usage

fcr_n_activated_down(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions
fcr_n_activated_up

**Value**

A data frame object with time series data having period 15 min and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/343

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- fcr_n_activated_down(start_time_utc = start,
                           end_time_utc = end,
                           user_key = key)
summary(df)
## End(Not run)
```

---

**fcr_n_activated_up**  
*Frequency Containment Reserve for Normal operation, activated up-regulation*

**Description**

FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Activated FCR-N volume up (MW) is calculated on the basis of the frequency in the Nordic synchronous system and maintained Finnish FCR-N capacity. Value is the average activated up-regulation power. Positive value means that the frequency has been below 50.0 Hz during the quarter, and reserve has been activated as up-regulation.

**Usage**

```
fcr_n_activated_up(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

**Arguments**

- **start_time_utc**  
  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ

- **end_time_utc**  
  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ

- **user_key**  
  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 15 min and unit type MW.
fcr_n_foreign_trade

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- fcr_n_activated_up(start_time_utc = start,
                        end_time_utc = end,
                        user_key = key)
summary(df)
## End(Not run)
```

---

fcr_n_foreign_trade  Frequency Containment Reserve for Normal operation, foreign trade

Description

The volume of the foreign trade of frequency containment reserve for normal operation (FCR-N) capacity. Positive numbers indicate import of capacity to Finland and negative numbers indicate export of capacity from Finland. The data contains the traded capacity for Sweden, Norway, Estonia and Russia*. The data will be published 22:45 (EET) on previous evening. FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.*Procuring reserves from Russia has ended 14.5.2022

Usage

`fcr_n_foreign_trade(start_time_utc = NA, end_time_utc = NA, user_key = NA)`

Arguments

- `start_time_utc`  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- fcr.n.foreign_trade(start_time_utc = start,
                      end_time_utc = end,
                      user_key = key)
summary(df)
## End(Not run)
```

---

### fcr.n_hourlymarket_bidsum

#### Frequency Containment Reserve for Normal operation, hourly market bids

**Description**

The volume of received Frequency Containment Reserves for Normal operation (FCR-N) bids. The volume of bids will be published 22:45 (EET) on previous evening. FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.

**Usage**

```r
fcr.n_hourlymarket_bidsum(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

**Arguments**

- `start_time_utc`  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MW.

**See Also**

Examples

```r
# Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- fcr_n_hourlymarket_prices(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
# End(Not run)
```

Description

Hourly prices (/MW,h) of procured frequency containment reserve for normal operation (FCR-N) in Finnish hourly market for each CET-timezone day is published previous evening at 22:45 (EET). FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.

Usage

```r
fcr_n_hourlymarket_prices(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MW.

See Also

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- fcr_n_hourlymarket_prices(start_time_utc = start,
   end_time_utc = end,
   user_key = key)
summary(df)

## End(Not run)
```

---

**fcr_n_hourlymarket_volumes**

*Frequency Containment Reserve for Normal operation, hourly market volumes*

---

### Description

Hourly volume of procured frequency containment reserve for normal operation (FCR-N) in Finnish hourly market for each CET-timezone day is published previous evening at 22:45 (EET). FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Hourly market is a reserve market operated by Fingrid. Procured volumes vary for each hour and price is the price of the most expensive procured bid.

### Usage

```r
fcr_n_hourlymarket_volumes(
   start_time_utc = NA,
   end_time_utc = NA,
   user_key = NA
)
```

### Arguments

- **start_time_utc** Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc** End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key** Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

### Value

A data frame object with time series data having period 1 h and unit type MW.

### See Also

https://data.fingrid.fi/en/datasets/316
fcr_n_yearlymarket_plans

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- fcr_n_yearlymarket_plans
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- fcr_n_hourlymarket_volumes(start_time_utc = start,

```  

## End(Not run)

---

### fcr_n_yearlymarket_plans

*Frequency Containment Reserve for Normal operation, yearly market plans*

#### Description

The hourly sum of reserve plans for frequency containment reserve for normal operation (FCR-N) in the yearly market. The data will be published 22:45 (EET) on previous evening. FCR-N is the frequency containment reserve used in the Nordic synchronous system that aims to keep the frequency in normal frequency range between 49.9 - 50.1 Hz. Yearly market is a reserve market operated by Fingrid. Hourly procured volumes vary according to the reserve plans submitted by the balancing service providers and the price is constant over the whole year.

#### Usage

```r
fcr_n_yearlymarket_plans(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

#### Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

#### Value

A data frame object with time series data having period 1 h and unit type MW.

#### See Also

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- ffr_price(start_time_utc = start,
                 end_time_utc = end,
                 user_key = key)
summary(df)
## End(Not run)
```

ffr_price

Fast Frequency Reserve FFR, price

Description

The price of procured Fast Frequency Reserve (FFR) (/MW). The price will be published 22:00 (EET) on previous evening. The price is determined by the price of the most expensive procured bid (marginal pricing). The Fast Frequency Reserve (FFR) is procured to handle low-inertia situations. The needed volume of Fast Frequency Reserve depends on the amount of inertia in the power system and the size of the reference incident.

Usage

```r
ffr_price(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type €/MW.

See Also

## Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- ffr_price(start_time_utc = start,
                end_time_utc = end,
                user_key = key)
```

## Description

The volume of procured Fast Frequency Reserve (FFR). The procured volume will be published 22:00 (EET) on previous evening. The Fast Frequency Reserve (FFR) is procured to handle low-inertia situations. The needed volume of Fast Frequency Reserve depends on the amount of inertia in the power system and the size of the reference incident.

## Usage

`ffr_procured(start_time_utc = NA, end_time_utc = NA, user_key = NA)`

## Arguments

- `start_time_utc`:  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`:  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`:  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

## Value

A data frame object with time series data having period 1 h and unit type 1 MW.

## See Also

ffr_procurement_forecast

Fast Frequency Reserve FFR, procurement forecast

Description

The procurement prognosis for Fast Frequency Reserve (FFR) (MW). Fingrid procures FFR based on the procurement prognosis. The prognosis is updated once a day, typically at 11:00 (EET). The Fast Frequency Reserve (FFR) is procured to handle low-inertia situations. The needed volume of Fast Frequency Reserve depends on the amount of inertia in the power system and the size of the reference incident.

Usage

ffr_procurement_forecast(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

### Description

The volume of received Fast Frequency Reserve (FFR) bids. The volume of bids will be published 22:00 (EET) on previous evening. The Fast Frequency Reserve (FFR) is procured to handle low-inertia situations. The needed volume of Fast Frequency Reserve depends on the amount of inertia in the power system and the size of the reference incident.

### Usage

```r
ffr_received_bids(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

### Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

### Value

A data frame object with time series data having period 1 h and unit type MW.

### See Also

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- ffr_received_bids(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)
```

## End(Not run)

---

**get_data**

*Main logic forming the API call.*

**Description**

Main logic forming the API call. API key can be provided as function parameter or environment variable (in .Renviron as FINGRID_OPENDATA_API_KEY). Function parameter has precedence in case both are provided. For API spec see https://data.fingrid.fi/en/pages/api.

**Usage**

```r
get_data(
    api_number = NA,
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA,
    page_size = 20000
)
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>api_number</code></td>
<td>Integer related to the Fingrid Open Data API</td>
</tr>
<tr>
<td><code>start_time_utc</code></td>
<td>Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ</td>
</tr>
<tr>
<td><code>end_time_utc</code></td>
<td>End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ</td>
</tr>
<tr>
<td><code>page_size</code></td>
<td>Integer how many observations are in a single page. Defaults to API maximum 20000.</td>
</tr>
</tbody>
</table>

**Value**

A data frame object that contains wanted open data.
Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"
end = "2024-06-03T00:00:00.000Z"
key = "MY_SUPER_SECRET"
df <- get_data(api_number = 124, # electricity consumption for Finland
               start_time_utc = start,
               end_time_utc = end,
               user_key = key,
               page_size = 20000)
summary(df)

## End(Not run)
```

get_page_data

Returns one page of JSON data

Description

This private function helps with JSON API pagination by returning a single page of observations at once.

Usage

```r
get_page_data(
  page_num, page_size, api_number, start_time_utc, end_time_utc, api_key)
```

Arguments

- **page_num**: Integer which page to retrieve from API.
- **page_size**: Integer how many observations per page are collected.
- **api_number**: Integer related to the Fingrid Open Data API
- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **api_key**: Character array holding API-key. Free from https://data.fingrid.fi/en.

Value

A data frame object that contains a single page from API.
imbalance_consumption_price

The price of consumption imbalance electricity

Description

The price of consumption imbalance power is the price for which Fingrid both purchases imbalance power from a balance responsible party and sells it to one. In the case of regulating hour, the regulation price is used. If no regulation has been made, the Elspot FIN price is used as the purchase and selling price of consumption imbalance power. Data gathering to Excel-sheet or XML format is possible in periods not longer that one year due to limitations in data transmission. Separate consumption imbalance ended when 1.11.2021 01.00 settlement model was changed to single imbalance.

Usage

imbalance_consumption_price(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- imbalance_consumption_price(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
imbalance_incentcomp_DK1

Incentivising Component (IC) DK1

Description

Incentivising Component (IC) DK1 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

```
imbalance_incentcomp_DK1(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from [https://data.fingrid.fi/en/instructions](https://data.fingrid.fi/en/instructions)

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_incentcomp_DK1(start_time_utc = start,
end_time_utc = end,
user_key = key)
summary(df)

## End(Not run)
```
imbalance_incentcomp_DK2

Incentivising Component (IC) DK2

Description

Incentivising Component (IC) DK2 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_DK2(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_incentcomp_DK2(start_time_utc = start,
                               end_time_utc = end,
                               user_key = key)
schema(df)

## End(Not run)
```
Incentivising Component (IC) FI

Description

Incentivising Component (IC) FI. More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_FI(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions.

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also

https://data.fingrid.fi/en/datasets/305

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_incentcomp_FI(start_time_utc = start,
                               end_time_utc = end,
                               user_key = key)
summary(df)
## End(Not run)
```
imbalance_incentcomp_NO1

Incentivising Component (IC) NO1

Description

Incentivising Component (IC) NO1

More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_NO1(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- imbalance_incentcomp_NO1(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
```

## End(Not run)
Description

Incentivising Component (IC) NO2

More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_NO2(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- imbalance_incentcomp_NO2(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
## End(Not run)```
imbalance_incentcomp_NO3

Incentivising Component (IC) NO3

Description

Incentivising Component (IC) NO3: More information about VoAA and IC can be found in the eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_NO3(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also

https://data.fingrid.fi/en/datasets/308

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_incentcomp_NO3(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
## End(Not run)
```
**imbalance_incentcomp_NO4**

*Incentivising Component (IC) NO4*

Description

Incentivising Component (IC) NO4 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

```
imbalance_incentcomp_NO4(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

Arguments

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_incentcomp_NO4(start_time_utc = start,
                              end_time_utc = end,
                              user_key = key)
summary(df)

## End(Not run)
```
Imbalance incentcomp_NO5

Incentivising Component (IC) NO5

Description

Incentivising Component (IC) NO5 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_NO5(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start <- "2024-06-01T00:00:00.000Z" # UTC
df <- imbalance_incentcomp_NO5(start_time_utc = start,
      end_time_utc = end,
      user_key = key)
summary(df)
## End(Not run)
```
imbalance_incentcomp_SE1

Incentivising Component (IC) SE1

Description

Incentivising Component (IC) SE1. More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_SE1(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_incentcomp_SE1(start_time_utc = start,
                                 end_time_utc = end,
                                 user_key = key)
summary(df)
```

## End(Not run)
imbalance_incentcomp_SE2

Incentivising Component (IC)SE2

Description

Incentivising Component (IC)SE2 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

```r
imbalance_incentcomp_SE2(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

Arguments

- `start_time_utc`  Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`   End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also

https://data.fingrid.fi/en/datasets/312

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_incentcomp_SE2(start_time_utc = start,
                                           end_time_utc = end,
                                           user_key = key)
summary(df)
## End(Not run)
```
Imbalance Incentcomp SE3

Incentivising Component (IC) SE3

Description

Incentivising Component (IC) SE3. More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_incentcomp_SE3(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  
Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ

date_time_utc  
End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ

user_key  
Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also

https://data.fingrid.fi/en/datasets/313

Examples

```r
# Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_incentcomp_SE3(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)

# End(Not run)
```
imbalance_incentcomp_SE4

Incentivising Component (IC) SE4

Description

Incentivising Component (IC) SE4 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99999 will be displayed for both.

Usage

imbalance_incentcomp_SE4(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_incentcomp_SE4(start_time_utc = start,
                                  end_time_utc = end,
                                  user_key = key)
summary(df)
## End(Not run)
```
imbalance_power_FI_SE  Imbalance power between Finland and Sweden

Description
The volume of power equals to the difference between measured and commercial transmission between Finland and Sweden. The tradetypes of commercial flow include day ahead, intraday and trades between Fingrid and Svenska Kraftnät during the operational hour. When the value of imbalance power volume is positive Fingrid has sold imbalance power to Sweden. When the value of imbalance power volume is negative Fingrid has bought imbalance power from Sweden.

Usage
imbalance_power_FI_SE(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments
start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value
A data frame object with time series data having period 1 h and unit type MWh/h.

See Also

Examples
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_power_FI_SE(start_time_utc = start,
        end_time_utc = end,
        user_key = key)
summary(df)
## End(Not run)
imbalance_price  

Description

Imbalance price for balance responsible party’s imbalance in Single price-single position settlement from 1.11.2021 01.00. Prices are updated hourly.

Usage

imbalance_price(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- imbalance_price(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
imbalance_production_purchase_price

The buying price of production imbalance electricity

Description

The down-regulating price of the hour is the price of production imbalance power purchased by Fingrid from a balance responsible party. If no down-regulation has been made or if the hour has been defined as an up-regulation hour, the Elspot FIN price is used as the purchase price of production imbalance power. Separate production balance ended when 1.11.2021 01.00 settlement model was changed to single imbalance.

Usage

imbalance_production_purchase_price(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MWh.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- imbalance_production_purchase_price(start_time_utc = start,
end_time_utc = end,
user_key = key)
summary(df)

## End(Not run)
imbalance_production_sales_price

The sales price of production imbalance electricity

Description

The up-regulating price of the hour is the price of production imbalance power sold by Fingrid to a balance responsible party. If no up regulation has been made or if the hour has been defined as a down-regulation hour, the day ahead spot price of Finland is used as the selling price of production imbalance power. Separate production balance ended when 1.11.2021 01.00 settlement model was changed to single imbalance.

Usage

imbalance_production_sales_price(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MWh.

See Also

https://data.fingrid.fi/en/datasets/93

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
der = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_production_sales_price(start_time_utc = start, 
                        end_time_utc = end, 
                        user_key = key)
summary(df)

## End(Not run)
**imbalance_voaa_dk1**  
*Value of Avoided Activation (VoAA) DK1*

**Description**

Value of Avoided Activation (VoAA) DK1. More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99999 will be displayed for both.

**Usage**

```r
imbalance_voaa_dk1(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

**Arguments**

- `start_time_utc`  
  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`  
  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`  
  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

**See Also**


**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_voaa_dk1(start_time_utc = start,
                           end_time_utc = end,
                           user_key = key)
summary(df)
```

## End(Not run)
imbalance_voaa_dk2  

Value of Avoided Activation (VoAA) DK2

Description

Value of Avoided Activation (VoAA) DK2 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_voaa_dk2(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- start_time_utc  
  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc  
  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key  
  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

```r
# Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"

df <- imbalance_voaa_dk2(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)

# End(Not run)
```
**Value of Avoided Activation (VoAA) FI**

**Description**

Value of Avoided Activation (VoAA) FI. More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

**Usage**

```r
imbalance_voaa_fi(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

**Arguments**

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

**See Also**

https://data.fingrid.fi/en/datasets/293

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_voaa_fi(start_time_utc = start,
                        end_time_utc = end,
                        user_key = key)
summary(df)
## End(Not run)
```
imbalance_voaa_no1

Value of Avoided Activation (VoAA) NO1

Description

Value of Avoided Activation (VoAA) NO1. More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_voaa_no1(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also

https://data.fingrid.fi/en/datasets/294

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_voaa_no1(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)
```
imbalance_voaa_no2

Value of Avoided Activation (VoAA) NO2

Description

Value of Avoided Activation (VoAA) NO2
More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_voaa_no2(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_voaa_no2(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
saveRDS(df, "imbalance_voaa_no2.Rds")

## End(Not run)
imbalance_voaa_no3 Value of Avoided Activation (VoAA) NO3

Description
Value of Avoided Activation (VoAA) NO3More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage
imbalance_voaa_no3(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments
start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value
A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also

Examples
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
der = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_voaa_no3(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)
## End(Not run)
Value of Avoided Activation (VoAA) NO4

More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as in the other Nordic countries, but corresponding values are published for informational purposes. In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_voaa_no4(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_voaa_no4(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)

## End(Not run)
Value of Avoided Activation (VoAA) NO5

Description

Value of Avoided Activation (VoAA) NO5 More information about VoAA and IC can be found in 
the eSet handbook (definitions and calculation rules). VoAA and IC are not implemented in Norway as 
in the other Nordic countries, but corresponding values are published for informational purposes. In 
case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed 
for both.

Usage

imbalance_voaa_no5(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc   Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"   # UTC
df <- imbalance_voaa_no5(start_time_utc = start,
end_time_utc = end,
user_key = key)
summary(df)

## End(Not run)
**imbalance_voaa_se1**  
*Value of Avoided Activation (VoAA) SE1*

**Description**

Value of Avoided Activation (VoAA) SE1 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

**Usage**

```r
imbalance_voaa_se1(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

**Arguments**

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

**See Also**


**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_voaa_se1(start_time_utc = start,
                           end_time_utc = end,
                           user_key = key)
summary(df)
## End(Not run)
```
imbalance_voaa_se2  Vältetyn aktiivimin arvo (VoAA) SE2

Description

Value of Avoided Activation (VoAA) SE2 More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_voaa_se2(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also

https://data.fingrid.fi/en/datasets/300

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY SUPER SECRET"

df <- imbalance_voaa_se2(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)

## End(Not run)
```
**imbalance_voaa_se3**  
_value of avoided activation (VoAA) SE3_

### Description

Value of Avoided Activation (VoAA) SE3More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

### Usage

`imbalance_voaa_se3(start_time_utc = NA, end_time_utc = NA, user_key = NA)`

### Arguments

- **start_time_utc**  
  Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- **end_time_utc**  
  End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- **user_key**  
  Character array holding API-key. Free from [https://data.fingrid.fi/en/instructions](https://data.fingrid.fi/en/instructions)

### Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

### See Also


### Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- imbalance_voaa_se3(start_time_utc = start,
                        end_time_utc = end,
                        user_key = key)
summary(df)

## End(Not run)
```
imbalance_voaa_se4  Value of Avoided Activation (VoAA) SE4

Description

Value of Avoided Activation (VoAA) SE4
More information about VoAA and IC can be found in eSett Handbook (definitions and calculation rules). In case VoAA and IC cannot be calculated according to the set rules, the value 99 999 will be displayed for both.

Usage

imbalance_voaa_se4(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc   End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key       Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type 1 €/MWh.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- imbalance_voaa_se4(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)

## End(Not run)
mfrr_cm_hourly_bids_down

Balancing Capacity (mFRR), down, hourly market, bids

Description

Data before 30.11.2022 is test-data. The amount of downwards balancing capacity bids in the balancing capacity market, MW/h. Fingrid procures mFRR capacity through the balancing capacity market, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

Usage

mfrr_cm_hourly_bids_down(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/331

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- mfrr_cm_hourly_bids_down(start_time_utc = start,
                                  end_time_utc = end,
                                  user_key = key)
summary(df)
```

## End(Not run)
Balancing Capacity (mFRR), up, hourly market, bids

Description

Data before 30.11.2022 is test-data. The amount of upwards balancing capacity bids in the balancing capacity market, MW/h. Fingrid procures mFRR capacity through the balancing capacity market, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

Usage

mfrr_cm_hourly_bids_up(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- mfrr_cm_hourly_bids_up(start_time_utc = start,
                              end_time_utc = end,
                              user_key = key)
supply(df)
## End(Not run)
```
**mfrr_cm_hourly_price_down**

*Balancing Capacity (mFRR), down, hourly market, price*

**Description**

Data before 30.11.2022 is test-data. The marginal price of downwards balancing capacity procured from the balancing capacity market, /MW.h. Fingrid procures mFRR capacity through the balancing capacity market auction, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

**Usage**

```r
mfrr_cm_hourly_price_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- **start_time_utc**  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**  Character array holding API-key. Free from [https://data.fingrid.fi/en/instructions](https://data.fingrid.fi/en/instructions)

**Value**

A data frame object with time series data having period 1 h and unit type €/MW.

**See Also**


**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_cm_hourly_price_down(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
mfrr_cm_hourly_price_up

Balancing Capacity Market (mFRR), up, hourly market, price

Description

Data before 30.11.2022 is test-data. The marginal price of upwards balancing capacity procured from the balancing capacity market, /MW,h. Fingrid procures mFRR capacity through the balancing capacity market auction, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

Usage

mfrr_cm_hourly_price_up(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type €/MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_cm_hourly_price_up(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
```

## End(Not run)
mfrr_cm_hourly_procuforecast_down

Balancing Capacity (mFRR), down, hourly market, procurement forecast

Description

Data before 30.11.2022 is test-data. The forecasted amount of downwards balancing capacity procurement (MW/h). Fingrid procures mFRR capacity through the balancing capacity market, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

Usage

mfrr_cm_hourly_procuforecast_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/335

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- mfrr_cm_hourly_procuforecast_down(start_time_utc = start,
                                        end_time_utc = end,
                                        user_key = key)
summary(df)
```

```r
## End(Not run)
```
mfrr_cm_hourly_procuforecast_up

Balancing Capacity (mFRR), up, hourly market, procurement forecast

Description

Data before 30.11.2022 is test-data. The forecasted amount of upwards balancing capacity procurement (MW/h). Fingrid procures mFRR capacity through the balancing capacity market, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

Usage

```r
mfrr_cm_hourly_procuforecast_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY SUPER_SECRET"
df <- mfrr_cm_hourly_procuforecast_up(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
**Description**

Data before 30.11.2022 is test-data. The amount of downwards balancing capacity procured from the balancing capacity market, MW/h. Fingrid procures mFRR capacity through the balancing capacity market auction, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

**Usage**

```r
mfrr_cm_hourly_procured_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss:SSSZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss:SSSZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MW/h.

**See Also**

https://data.fingrid.fi/en/datasets/328

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- mfrr_cm_hourly_procured_down(start_time_utc = start,
                                   end_time_utc = end,
                                   user_key = key)
summary(df)
## End(Not run)
```
mfrr_cm_hourly_procured_EE

Balancing Capacity (mFRR), hourly market, procurement from Estonia

Description

Data before 30.11.2022 is test-data. In addition to the national weekly market, Fingrid also has the possibility to procure mFRR balancing capacity from Estonia. This dataset includes the procured balancing capacity amounts from Estonia, MW/week. The procured amount is published at latest on Friday of the week before the procurement week at 12:00 (EET).

Usage

mfrr_cm_hourly_procured_EE(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW/h.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- mfrr_cm_hourly_procured_EE(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)

## End(Not run)
mfrr_cm_hourly_procured_up

Balancing Capacity (mFRR), up, hourly market, procured volume

Description
Data before 30.11.2022 is test-data. The amount of upwards balancing capacity procured from the balancing capacity market, MW/h. Fingrid procures mFRR capacity through the balancing capacity market auction, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment.

Usage

mfrr_cm_hourly_procured_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value
A data frame object with time series data having period 1 h and unit type MW.

See Also
https://data.fingrid.fi/en/datasets/327

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_cm_hourly_procured_up(start_time_utc = start,
                                  end_time_utc = end,
                                  user_key = key)
summary(df)

## End(Not run)
Balancing Capacity Market price

Description

The price of capacity procured from the balancing capacity market, /MW.h. Fingrid procures mFRR capacity through the balancing capacity market on a weekly auction, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment. The price is published at latest on Friday on the week before the procurement week at 12:00 (EET).

Usage

mfrr_cm_weekly_price(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 vk and unit type €.

See Also

https://data.fingrid.fi/en/datasets/262

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
def <- mfrr_cm_weekly_price(start_time_utc = start,
end_time_utc = end,
user_key = key)
summary(def)
## End(Not run)
```
mfrr_cm_weekly_procured

Balancing Capacity Market results

**Description**

The amount of capacity procured from the balancing capacity market, MW/week. Fingrid procures mFRR capacity through the balancing capacity market on a weekly auction, which is held when needed. Balance service provider pledges itself to leave regulating bids on the regulation market. For that the balance service provider is entitled to capacity payment. The procured amount is published at latest on Friday on the week before the procurement week at 12:00 (EET)

**Usage**

```
mfrr_cm_weekly_procured(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

**Arguments**

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 wk and unit type MW.

**See Also**


**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- mfrr_cm_weekly_procured(start_time_utc = start,
                  end_time_utc = end,
                  user_key = key)
schedule(df)
```

## End(Not run)
mfrr_em_bids_price_last_activated_down_RTD

Down-regulation bids, price of the last activated - real time data

Description

The price of the last activated down-regulation bid. The price is published real-time when Finland is a separate regulation area.

Usage

mfrr_em_bids_price_last_activated_down_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type €/MWh.

See Also

https://data.fingrid.fi/en/datasets/251

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_em_bids_price_last_activated_down_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
The sum of the down-regulation bids in the Balancing energy market

Description

The hourly sum of the down-regulation offers given by Finnish parties to the Balancing energy market is published hourly with one hour delay, e.g. information from hour 07-08 is published at 9 o’clock. Balancing energy market is market place for manual frequency restoration reserve (mFRR) which is used to balance the electricity generation and consumption in real time. The Balancing energy market organized by Fingrid is part of the Nordic Balancing energy market that is called also Regulating power market. Fingrid orders up- or down-regulation from the Balancing energy market. Down-regulation considers increasing of consumption or reducing of generation. Down-regulation bids have negative sign.

Usage

mfrr_em_bids_sum_regulation_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MW.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- mfrr_em_bids_sum_regulation_down(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)
The sum of the up-regulation bids in the balancing energy market

Description

The hourly sum of the up-regulation offers given by Finnish parties to the Balancing energy market is published hourly with one hour delay, e.g., information from hour 07-08 is published at 9 o’clock. Balancing energy market is market place for manual frequency restoration reserve (mFRR) which is used to balance the electricity generation and consumption in real time. The Balancing energy market organized by Fingrid is part of the Nordic Balancing energy market that is called also Regulating power market. Fingrid orders up- or down-regulation from the Balancing energy market. Up-regulation considers increasing of production or reducing of consumption.

Usage

```r
mfrr_em_bids_sum_regulation_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- mfrr_em_bids_sum_regulation_up(start_time_utc = start, end_time_utc = end, user_key = "MY_SUPER_SECRET")
```

---

### End(Not run)
mfrr_em_hour_change_regulation_down

Hour change regulation, down-regulation

Description

In order to reduce problems encountered at the turn of the hour in the Nordic countries or in Finland, the planned production changes will be transferred to begin 15 minutes before or after the planned moment.

Usage

mfrr_em_hour_change_regulation_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/239

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_em_hour_change_regulation_down(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)
summary(df)

## End(Not run)
mfrr_em_hour_change_regulation_up

Description

In order to reduce problems encountered at the turn of the hour in the Nordic countries or in Finland, the planned production changes will be transferred to begin 15 minutes before or after the planned moment.

Usage

```r
mfrr_em_hour_change_regulation_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- mfrr_em_hour_change_regulation_up(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
**mfrr_em_ordered_regulations_down**

*Ordered down-regulations from Balancing energy market in Finland*

**Description**

Ordered down-regulations from Balancing energy market in Finland. The volume of ordered down-regulations from Balancing energy market in Finland is published hourly with two hours delay, eg. information from hour 06-07 is published at 9 o’clock. Balancing energy market is market place for manual frequency restoration reserve (mFRR) which is used to balance the electricity generation and consumption in real time. The Balancing energy market organized by Fingrid is part of the Nordic Balancing energy market that is called also Regulating power market. Fingrid orders up- or down-regulation from the Balancing energy market. Down-regulation considers increasing of consumption or reducing of generation. Down-regulation volume has negative sign.

**Usage**

```r
mfrr_em_ordered_regulations_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MWh/h.

**See Also**

https://data.fingrid.fi/en/datasets/33

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_em_ordered_regulations_down(start_time_utc = start,
                                        end_time_utc = end,
                                        user_key = key)
summary(df)
```
Ordered up-regulations from Balancing energy market in Finland

Description

Ordered up-regulations from Balancing energy market in Finland. The volume of ordered up-regulations from Balancing energy market in Finland is published hourly with two hours delay, eg. information from hour 06-07 is published at 9 o’clock. Balancing energy market is market place for manual frequency restoration reserve (mFRR) which is used to balance the electricity generation and consumption in real time. The Balancing energy market organized by Fingrid is part of the Nordic Balancing energy market that is called also Regulating power market. Fingrid orders up- or down-regulation from the Balancing energy market. Up-regulation considers increasing of generation or reducing of consumption.

Usage

mfrr_em_ordered_regulations_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/34

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
der = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
   df <- mfrr_em_ordered_regulations_up(start_time_utc = start,
## Description

Other power transactions which are necessary in view of the power system.

## Usage

```r
mfrr_em_other_pwr_regulation_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

## Arguments

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

## Value

A data frame object with time series data having period 1 h and unit type MWh/h.

## See Also


## Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_em_other_pwr_regulation_down(start_time_utc = start,
                                         end_time_utc = end,
                                         user_key = key)
summary(df)
```

## End(Not run)
Other power transactions, up-regulation

Description

Other power transactions which are necessary in view of the power system.

Usage

```r
mfrr_em_other_pwr_regulation_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- mfrr_em_other_pwr_regulation_up(start_time_utc = start,
end_time_utc = end,
user_key = key)
summary(df)

## End(Not run)
```
**mfrr_em_price_last_activated_bid_RTD**

*Price of the last activated up-regulation bid - real time data*

**Description**

The price of the last activated up-regulation bid. The price is published real-time when Finland is a separate regulation area.

**Usage**

```r
mfrr_em_price_last_activated_bid_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc`  
  Start time in UTC. Character array YYYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`  
  End time in UTC. Character array YYYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`  
  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type €/MWh.

**See Also**


**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_em_price_last_activated_bid_RTD(start_time_utc = start,
                                         end_time_utc = end,
                                         user_key = key)
summary(df)

## End(Not run)
```
Description

Down-regulation price in the Balancing energy market. The price of the cheapest regulating bid used in the balancing power market during the particular hour; however, at the most the price for price area Finland in Nord Pool Spot (Elspot FIN). Down-regulating price in Finland is the price of the most expensive down-regulating bid used in the Balancing energy market during the hour in question; however, it is at the most the day ahead market price for the price area Finland. Down-regulating price for each hour is published hourly with one hour delay, eg. information from hour 07-08 is published at 9 o’clock. Balancing energy market is market place for manual frequency restoration reserve (mFRR) which is used to balance the electricity generation and consumption in real time. The Balancing energy market organized by Fingrid is part of the Nordic Balancing energy market that is called also Regulating power market. Fingrid orders up- or down-regulation from the Balancing energy market. Down-regulation considers increasing of consumption or reducing of generation.

Usage

```r
mfrr_em_price_regulation_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MWh.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
date = "2024-06-03T00:00:00.000Z" # UTC
```

Up-regulating price in the Balancing energy market

Description

Up-regulating price in Finland is the price of the most expensive up-regulating bid used in the Balancing energy market during the hour in question; however, it is at least the day ahead market price for the price area Finland. Up-regulating price for each hour is published hourly with one hour delay, e.g. information from hour 07-08 is published at 9 o’clock. Balancing energy market is market place for manual frequency restoration reserve (mFRR) which is used to balance the electricity generation and consumption in real time. The Balancing energy market organized by Fingrid is part of the Nordic Balancing energy market that is called also Regulating power market. Fingrid orders up- or down-regulation from the Balancing energy market. Up-regulation considers increasing of production or reducing of consumption.

Usage

```r
mfrr_em_price_regulation_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type EUR/MWh.

See Also

https://data.fingrid.fi/en/datasets/244
mfrr_em_special_regulation_down

Special regulation, down-regulation

Description

Regulation which takes place in the regulating power market by Fingrid for reasons other than the needs of national balance management

Usage

mfrr_em_special_regulation_down(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type MWh/h.

See Also

https://data.fingrid.fi/en/datasets/118
### mfrr_em_special_regulation_up

#### Special regulation, up-regulation

**Description**

Regulation which takes place in the regulating power market by Fingrid for reasons other than the needs of national balance management.

**Usage**

```r
mfrr_em_special_regulation_up(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- **start_time_utc**: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- **end_time_utc**: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ.
- **user_key**: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 1 h and unit type MWh/h.

**See Also**

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00Z" # UTC
der = "2024-06-03T00:00:00Z" # UTC
key = "MY_SUPER_SECRET"
df <- mfrr_em_special_regulation_up(start_time_utc = start,
                                       end_time_utc = end,
                                       user_key = key)
summary(df)

## End(Not run)
```

---

**nscut_measured_flow**  
Measured transmission of electricity in Finland from north to south

### Description

Measured electricity flow in North-South cut in Finland (cut P1). In the graph flow from North to South is positive. The Data before 28.03.2024 is in hourly resolution.

### Usage

```r
nscut_measured_flow(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

### Arguments

- **start_time_utc**  
  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**  
  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**  
  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

### Value

A data frame object with time series data having period 1 min and unit type MWh/h.

### See Also

https://data.fingrid.fi/en/datasets/30

### Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00Z" # UTC
der = "2024-06-03T00:00:00Z" # UTC
key = "MY_SUPER_SECRET"
df <- nscut_measured_flow(start_time_utc = start,
                           end_time_utc = end,
                           user_key = key)
summary(df)
```

```r
## End(Not run)
```
Planned weekly capacity from north to south

### Description

Planned weekly capacity on North-South cut in Finland (cut P1) from North to South. Planned outages are included in the weekly capacity, information is not updated after disturbances.

### Usage

```r
nscut_weekly_plan_cap_NS(start_time_utc = NA, end_time_utc = NA, user_key = NA)
```

### Arguments

- `start_time_utc`: Start time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `end_time_utc`: End time in UTC. Character array `YYYY-MM-ddTHH:mm:ss.sssZ`
- `user_key`: Character array holding API-key. Free from [https://data.fingrid.fi/en/instructions](https://data.fingrid.fi/en/instructions)

### Value

A data frame object with time series data having period 1 h and unit type MWh/h.

### See Also


### Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- nscut_weekly_plan_cap_NS(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)

## End(Not run)```
Planned weekly capacity from south to north

Description

Planned weekly capacity on North-South cut in Finland (cut P1) from South to North. Planned outages are included in the weekly capacity, information is not updated after disturbances.

Usage

nscut_weekly_plan_cap_SN(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 h and unit type Mwh/h.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- nscut_weekly_plan_cap_SN(start_time_utc = start,
                                 end_time_utc = end,
                                 user_key = key)
summary(df)
## End(Not run)
Description

Cogeneration of district heating based on the real-time measurements in Fingrid’s operation control system. The data is updated every 3 minutes. Cogeneration means power plants that produce both electricity and district heating or process steam (combined heat and power, CHP).

Usage

```r
powersys_cogeneration_district_heating_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/201

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY SUPER_SECRET"
df <- powersys_cogeneration_district_heating_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
powersys_cumulative_surplus_RTD

_Surplus/deficit, cumulative - real time data_

**Description**

Information is based on the real time measurements in Fingrid’s power control system. Power deficit/surplus represents the balance between production and consumption in Finland, taking into account imports and exports. It is calculated as the difference between the measured net import/export and the confirmed net exchange program between Finland and the other Nordic countries. The cumulative production deficit/surplus is the hourly energy generated from the difference. Sign convention: production deficit -, surplus +. The data is updated every 3 minutes.

**Usage**

```r
powersys_cumulative_surplus_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc`  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 3 min and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/186

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- powersys_cumulative_surplus_RTD(start_time_utc = start,
                                      end_time_utc = end,
                                      user_key = key)
summary(df)
```

## End(Not run)
Description
Electricity consumption in Finland is calculated based on production and import/export. The data is updated every 3 minutes. Production information and import/export are based on the real-time measurements in Fingrid’s operation control system.

Usage
powersys_electricity_consumption_FI_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value
A data frame object with time series data having period 3 min and unit type MW.

See Also

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- powersys_electricity_consumption_FI_RTD(start_time_utc = start,
                                              end_time_utc = end,
                                              user_key = key)
summary(df)
## End(Not run)
powersys_electricity_netimport

Net import/export of electricity - real time data

Description

Net import to Finland and net export from Finland. The data is updated every 3 minutes. Production information and import/export are based on the real-time measurements in Fingrid’s operation control system.

Usage

powersys_electricity_netimport(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/194

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"

df <- powersys_electricity_netimport(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)

## End(Not run)
Electricity production in Finland - real time data

Description

Electricity production in Finland based on the real-time measurements in Fingrid’s operation control system. The data is updated every 3 minutes.

Usage

```r
powersys_electricity_production_FI_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- powersys_electricity_production_FI_RTD(start_time_utc = start, end_time_utc = end, user_key = key)
summary(df)

## End(Not run)
```
powersys_electricity_production_reservetotal_RTD

Electricity production, reserve power plants and small-scale production - real time data

Description
Reserve power plants electrical production is based on the real-time measurements in Fingrid’s operation control system. Estimated small-scale production is added, of which there are no measurements available. The data is updated every 3 minutes.

Usage

powersys_electricity_production_reservetotal_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value
A data frame object with time series data having period 3 min and unit type MW.

See Also

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- powersys_electricity_production_reservetotal_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)

## End(Not run)
Electricity shortage status

Electricity shortage status. An electricity shortage occurs when electricity production and imports are not enough to cover electricity consumption. In such cases, it is necessary to restrict consumption to stop the power system from crashing altogether. Fingrid informs citizens on its website(https://www.fingrid.fi/en/grid/information-regarding-electricity-shortages/) and with a press release in accordance with the three-step procedure when the situation possibly escalates.* 0 = Normal 1 = Electricity shortage possible 2 = High risk of electricity shortage 3 = Electricity shortage

The data is updated every 3 minutes.

Usage

```r
powersys_electricity_shortage_status_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type 0-3.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- powersys_electricity_shortage_status_RTD(start_time_utc = start,
                                               end_time_utc = end,
                                               user_key = key)
summary(df)
```

## End(Not run)
Description

Frequency of the power system based on the real-time measurements in Fingrid’s operation control system. The data is updated every 3 minutes.

Usage

powersys_frequency_RTD(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type Hz.

See Also

https://data.fingrid.fi/en/datasets/177

Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- powersys_frequency_RTD(start_time_utc = start,
                          end_time_utc = end,
                          user_key = key)
summary(df)
## End(Not run)
Hydro power production - real time data

Description

Hydro power production in Finland based on the real-time measurements in Fingrid’s operation control system. The data is updated every 3 minutes.

Usage

powersys_hydro_power_production_RTD(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- powersys_hydro_power_production_RTD(start_time_utc = start,
                                           end_time_utc = end,
                                           user_key = key)
summary(df)
## End(Not run)
```
Industrial cogeneration - real time data

Description

Cogeneration of industry based on the real-time measurements in Fingrid’s operation control system. The data is updated every 3 minutes. Cogeneration means power plants that produce both electricity and district heating or process steam (combined heat and power, CHP).

Usage

```r
powersys_industrial_cogeneration_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"

df <- powersys_industrial_cogeneration_RTD(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)

summary(df)

## End(Not run)
powersys_kinetic_energy_nordic_pwr_sys_RTD

Kinetic energy of the Nordic power system - real time data

Description

Real-time estimate of the kinetic energy of the Nordic power system calculated by the Nordic transmission system operators. The data is updated every 1 minute. Historical data as of 27.3.2015 available.

Usage

```
powersys_kinetic_energy_nordic_pwr_sys_RTD(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

Arguments

- **start_time_utc**  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 1 min and unit type 1 GWs.

See Also


Examples

```
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- powersys_kinetic_energy_nordic_pwr_sys_RTD(start_time_utc = start,
                                               end_time_utc = end,
                                               user_key = key)
summary(df)
## End(Not run)
```
powersys_nuclear_power_production_RTD

Nuclear power production - real time data

Description

Nuclear power production in Finland based on the real-time measurements in Fingrid’s operation control system. The data is updated every 3 minutes. Due to the fire on our Olkiluoto substation the total amount of nuclear power measurement has been incorrect between 18 July at 09:00 to 20 July at 13:00. Data corrected 25.1.2019.

Usage

powersys_nuclear_power_production_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

- start_time_utc: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- end_time_utc: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- user_key: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also

https://data.fingrid.fi/en/datasets/188

Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- powersys_nuclear_power_production_RTD(start_time_utc = start,
                                          end_time_utc = end,
                                          user_key = key)
summary(df)
## End(Not run)
```
powersys_peak_load_power_RTD

*Peak load power - real time data*

**Description**

Activated peak load power based on the real-time measurements in Fingrid’s operation control system including peak load reserve activations and trial runs during winter period. The data is updated every 3 minutes.

**Usage**

```r
powersys_peak_load_power_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

**Arguments**

- `start_time_utc` Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc` End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key` Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 3 min and unit type MW.

**See Also**

https://data.fingrid.fi/en/datasets/183

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"
df <- powersys_peak_load_power_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
## End(Not run)
```
Description

Finland’s energy production surplus/deficit. Information is based on the real time measurements in Fingrid’s power control system. Power deficit/surplus represents the balance between power production and consumption in Finland, taking into account imports and exports. Power deficit/surplus is calculated as the difference between the measured net import/export and the confirmed net exchange program between Finland and the other Nordic countries. Sign convention: production deficit -, surplus + The data is updated every 3 minutes.

Usage

powersys_production_surplus(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
end = "2024-06-03T00:00:00.000Z" # UTC
key = "MY_SUPER_SECRET"

df <- powersys_production_surplus(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)

## End(Not run)
powersys_state_RTD  

Power system state - real time data

Description

Different states of the power system - traffic lights: 1=green, 2=yellow, 3=red, 4=black, 5=blue*

Green: Power system is in normal secure state.* Yellow: Power system is in endangered state. The adequacy of the electricity is endangered or the power system doesn’t fulfill the security standards.*

Red: Power system is in disturbed state. Load shedding has happened in order to keep the adequacy and security of the power system or there is a remarkable risk to a wide black out. * Black: An extremely serious disturbance or a wide black out in Finland.* Blue: The network is being restored after an extremely serious disturbance or a wide blackout. The data is updated every 3 minutes.

Usage

powersys_state_RTD(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type no.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.00Z"  # UTC
df <- powersys_state_RTD(start_time_utc = start, 
                          end_time_utc = end,
                          user_key = key)
summary(df)
```

## End(Not run)
powersys_temp_helsinki_RTD

Temperature in Helsinki - real time data

Description

Outside air temperature measurement at Tammisto substation. The data is updated every 3 minutes.

Usage

```r
powersys_temp_helsinki_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- `start_time_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type C.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- powersys_temp_helsinki_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)

## End(Not run)
```
powersys_temp_jyvaskyla_RTD

Temperature in Jyväskylä - real time data

Description
Outside air temperature measurement at Petäjävesi substation. The data is updated every 3 minutes.

Usage
powersys_temp_jyvaskyla_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments

  start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
  end_time_utc   End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
  user_key       Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value
A data frame object with time series data having period 3 min and unit type C.

See Also

Examples
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- powersys_temp_jyvaskyla_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)

## End(Not run)
powersys_temp_oulu_RTD

Temperature in Oulu - real time data

Description

Outside air temperature measurement at Leväsuo substation. The data is updated every 3 minutes.

Usage

powersys_temp_oulu_RTD(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc   End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key       Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type C.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- powersys_temp_oulu_RTD(start_time_utc = start,
                            end_time_utc = end,
                            user_key = key)
summary(df)
## End(Not run)
```
**powersys_temp_rovaniemi_RTD**

*Temperature in Rovaniemi - real time data*

**Description**

Outside air temperature measurement at Valajaskoski substation. The data is updated every 3 minutes.

**Usage**

```r
powersys_temp_rovaniemi_RTD(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)
```

**Arguments**

- `start_time_utc`  Start time in UTC. Character array YYYYY-MM-ddTHH:mm:ss.sssZ
- `end_time_utc`    End time in UTC. Character array YYYYY-MM-ddTHH:mm:ss.sssZ
- `user_key`        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 3 min and unit type C.

**See Also**

https://data.fingrid.fi/en/datasets/185

**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
end = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- powersys_temp_rovaniemi_RTD(start_time_utc = start, 
                                   end_time_utc = end, 
                                   user_key = key)
summary(df)

## End(Not run)
```
powersys_time_deviation_RTD

Time deviation - real time data

Description

Time deviation is the time difference in seconds between a clock running according to the frequency of the grid and a reference clock independent of the frequency of the grid. The data is updated every 3 minutes.

Usage

powersys_time_deviation_RTD(
    start_time_utc = NA,
    end_time_utc = NA,
    user_key = NA
)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type sec.

See Also


Examples

## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
der = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- powersys_time_deviation_RTD(start_time_utc = start,
    end_time_utc = end,
    user_key = key)
summary(df)

## End(Not run)
Transmission between Finland and Estonia - real time data

Description

Power transmission between Finland and Estonia HVDC tie lines (Estlink 1 and Estlink 2). Data is based on the real-time measurements in Fingrid’s operation control system. Positive sign means transmission from Finland to Estonia. Negative sign means transmission from Estonia to Finland. The data is updated every 3 minutes.

Usage

powersys_trans_FI_EE_RTD(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- powersys_trans_FI_EE_RTD(start_time_utc = start,
                               end_time_utc = end,
                               user_key = key)
summary(df)
## End(Not run)
```
Description

Power transmission between Finland and Norway 220kV AC tie line. Data is based on the real-time measurements in Fingrid’s operation control system. Positive sign means transmission from Finland to Norway. Negative sign means transmission from Norway to Finland. The data is updated every 3 minutes.

Usage

powersys_trans_FI_NO_RTD(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- powersys_trans_FI_NO_RTD(start_time_utc = start,
                                end_time_utc = end,
                                user_key = key)
summary(df)
## End(Not run)
```
transmission between Sweden and Åland - real time data

Description

Power transmission between Åland and Sweden based on the real-time measurements in Fingrid’s operation control system. Åland is a part of SE3 (Central-Sweden) bidding zone. Positive sign means transmission from Åland to Sweden. Negative sign means transmission from Sweden to Åland. The data is updated every 3 minutes.

Usage

powersys_trans_FI_OO_RTD(start_time_utc = NA, end_time_utc = NA, user_key = NA)

Arguments

start_time_utc Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" # UTC
df <- powersys_trans_FI_OO_RTD(start_time_utc = start,
                              end_time_utc = end,
                              user_key = key)
summary(df)
## End(Not run)
```
Transmission between Finland and Northern Sweden - real time data

Description

Power transmission between Northern Sweden (SE1) and Finland (FI) 400kV AC tie line. Data is based on the real-time measurements in Fingrid’s operation control system. Positive sign means transmission from Finland to Northern Sweden (SE1). Negative sign means transmission from Northern Sweden (SE1) to Finland. The data is updated every 3 minutes.

Usage

```r
powersys_trans_FI_SE1_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)
```

Arguments

- **start_time_utc**  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **end_time_utc**  End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- **user_key**  Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value

A data frame object with time series data having period 3 min and unit type MW.

See Also


Examples

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
df <- powersys_trans_FI_SE1_RTD(start_time_utc = start,
  end_time_utc = end,
  user_key = key)
summary(df)
```

## End(Not run)
Transmission between Finland and Central Sweden - real time data

Description
Power transmission between Central Sweden (SE3) and Finland (FI) HVDC tie lines. Data is based on the real-time measurements in Fingrid’s operation control system. Positive sign means transmission from Finland to Central Sweden (SE3). Negative sign means transmission from Central Sweden (SE3) to Finland. The data is updated every 3 minutes.

Usage
powersys_trans_FI_SE3_RTD(
  start_time_utc = NA,
  end_time_utc = NA,
  user_key = NA
)

Arguments
start_time_utc  Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
end_time_utc    End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
user_key        Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

Value
A data frame object with time series data having period 3 min and unit type MWh/h.

See Also

Examples
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z"  # UTC
der = "2024-06-03T00:00:00.000Z"  # UTC
key = "MY_SUPER_SECRET"
df <- powersys_trans_FI_SE3_RTD(start_time_utc = start,
                              end_time_utc = end,
                              user_key = key)
summary(df)
## End(Not run)
powersys\_wind\_pwr\_production\_RTD

*Wind power production - real time data*

**Description**

Wind power production based on the real-time measurements in Fingrid’s operation control system. About two percent of the production capacity is estimated as measurements aren’t available. The data is updated every 3 minutes.

**Usage**

```r
powersys\_wind\_pwr\_production\_RTD(
  start\_time\_utc = NA,
  end\_time\_utc = NA,
  user\_key = NA
)
```

**Arguments**

- `start\_time\_utc`: Start time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `end\_time\_utc`: End time in UTC. Character array YYYY-MM-ddTHH:mm:ss.sssZ
- `user\_key`: Character array holding API-key. Free from https://data.fingrid.fi/en/instructions

**Value**

A data frame object with time series data having period 3 min and unit type MW.

**See Also**


**Examples**

```r
## Not run:
library(finnishgrid)
start = "2024-06-01T00:00:00.000Z" \# UTC
df <- powersys\_wind\_pwr\_production\_RTD(
  start\_time\_utc = start,
  end\_time\_utc = end,
  user\_key = key
)
summary(df)

## End(Not run)
```
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