Package 'finnishgrid'

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Type Package

Title 'Fingrid Open Data API' R Client

Version 0.1.0

Description R API client package for 'Fingrid Open Data' 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)

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VignetteBuilder knitr

NeedsCompilation no

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R topics documented:

`activated_aFRR_down` *Activated automatic frequency restoration reserve, up*

Description

Check https://data.fingrid.fi/en/dataset/activated-automatic-frequency-restoration-reserve-up

Usage

```
activated_aFRR_down(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains activated automatic Frequency Restoration Reserve (aFRR) energy, up, in MWh.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- activated_aFRR_down(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

---

activated_aFRR_up *Activated automatic frequency restoration reserve, down*

Description

Check https://data.fingrid.fi/en/dataset/activated-automatic-frequency-restoration-reserve-down

Usage

```
activated_aFRR_up(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains activated automatic Frequency Restoration Reserve (aFRR) energy, down, in MWh.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- activated_aFRR_up(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

---

activated_down_regulation_power

Activated down-regulation power

Description

Check https://data.fingrid.fi/en/dataset/aktivoitu-alassaatoteho

Usage

```
activated_down_regulation_power(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the activated downward power from balancing power market. The value is given for each 15 minutes and indicated the amount of activated power in the end of each 15 minute time period. The values are available starting from December 2018.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- activated_down_regulation_power(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

---

activated_FCRN *Activated frequency containment reserve for normal operation*

Description

Check https://data.fingrid.fi/en/dataset/activated-frequency-containment-reserve-for-normal-operation

Usage

```
activated_FCRN(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains activated Frequency Containment Reserve for Normal operation (FCR-N) is published hourly one hour after the hour in question, for example the value for hour 07-08 is published at 9 o'clock.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- activated_FCRN(
    start_time = start,
    end_time = end,
```

```
    user_key = key)
summary(df)

## End(Not run)
```

`activated_up_regulation_power` *Activated up-regulation power*

Description

Check https://data.fingrid.fi/en/dataset/aktivoitu-ylossaatoteho

Usage

```
activated_up_regulation_power(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the activated upward power from balancing power market. The value is given for each 15 minutes and indicated the amount of activated power in the end of each 15 minute time period. The values are available starting from December 2018.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- activated_up_regulation_power(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

balancing_capacity_market_bids
Balancing Capacity Market bids

Description

Check https://data.fingrid.fi/en/dataset/saatokapasiteettimarkkinat-tarjoukset

Usage

```
balancing_capacity_market_bids(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the amount of bids in the balancing capacity market, MW/week. Fingrid procures mFRR capacity throught the balancing capacity market on a weekly auction, which is held when needed.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- balancing_capacity_market_bids(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

balancing_capacity_market_price *Balancing Capacity Market price*

Description

Check https://data.fingrid.fi/en/dataset/saatokapasiteettimarkkinat-hinta

Usage

```
balancing_capacity_market_price(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the price of capacity procured from the balancing capacity market, EUR/MW,h. Fingrid procures mFRR capacity throught the balancing capacity market on a weekly auction, which is held when needed.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- balancing_capacity_market_price(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

balancing_capacity_market_results
Balancing Capacity Market results

Description

Check https://data.fingrid.fi/en/dataset/saatokapasiteettimarkkinat-toteutunut-hankinta

Usage

```
balancing_capacity_market_results(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the amount of capacity procured from the balancing capacity market, MW/week. Fingrid procures mFRR capacity throught the balancing capacity market on a weekly auction, which is held when needed.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- balancing_capacity_market_results(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`bilateral_trade_capacity_RUS_to_FI` *Bilateral trade capacity RUS-FI*

Description

Check https://data.fingrid.fi/en/dataset/bilateral-trade-capacity-rus-fi

Usage

```
bilateral_trade_capacity_RUS_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the bilateral capacity on the 400 kV connection from Russia (RUS) to Finland (FI) that is reserved to bilateral trade of the following commercial day. The capacity is confirmed by Fingrid and the Russian parties.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- bilateral_trade_capacity_RUS_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`bilateral_trade_FI_to_RUS` *Bilateral trade between Finland and Russia*

Description

Check https://data.fingrid.fi/en/dataset/bilateral-trade-between-finland-and-russia

Usage

```
bilateral_trade_FI_to_RUS(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains bilateral trade between Finland and Russia. Fingrid and the Russian parties confirm the bilateral trades on 400 kV cross-border connection in the morning of the commercial day D for the following commercial day D+1. The confirmed bilateral trades will be bid price-independently on the electricity spot market

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- bilateral_trade_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`biliteral_trade_capacity_FI_to_RUS` *Bilateral trade capacity FI-RUS*

Description

Check https://data.fingrid.fi/en/dataset/bilateral-trade-capacity-fi-rus

Usage

```
biliteral_trade_capacity_FI_to_RUS(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the bilateral capacity on the 400 kV connection from Russia to Finland that is reserved to bilateral trade of the following commercial day. The capacity is confirmed by Fingrid and the Russian parties.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- biliteral_trade_capacity_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`border_transmission_fee_FI_to_RUS` *Cross-border transmission fee, export to Russia*

Description

Check https://data.fingrid.fi/en/dataset/cross-border-transmission-fee-export-to-russia

Usage

```
border_transmission_fee_FI_to_RUS(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hourly cross-border transmission fee (dynamic tariff) for exports to Russia on Fingrid's connections.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- border_transmission_fee_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`border_transmission_fee_RUS_to_FI` *Cross-border transmission fee, import from Russia*

Description

Check https://data.fingrid.fi/en/dataset/cross-border-transmission-fee-import-from-russia

Usage

```
border_transmission_fee_RUS_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hourly cross-border transmission fee (dynamic tariff) for imports from Russia on Fingrid's connections.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- border_transmission_fee_RUS_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

cogeneration_district_heating_RTD *Cogeneration of district heating - real time data*

Description

Check https://data.fingrid.fi/en/dataset/cogeneration

Usage

```
cogeneration_district_heating_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- cogeneration_district_heating_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

commercial_electricity_flow_FI_to_EE
Commercial electricity flow between Finland and Estonia (FI-EE)

Description

Check https://data.fingrid.fi/en/dataset/commercial-flow-fi-ee

Usage

```
commercial_electricity_flow_FI_to_EE(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- commercial_electricity_flow_FI_to_EE(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

commercial_electricity_flow_FI_to_SE1 *Commercial electricity flow between Finland and Northern Sweden (FI-SE1)*

Description

Check https://data.fingrid.fi/en/dataset/commercial-flow-fi-se1

Usage

```
commercial_electricity_flow_FI_to_SE1(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains commercial transmission of electricity (dayahead market and intraday market) between Finland (FI) and Northern Sweden (SE1). Positive sign is export from Finland to Sweden.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- commercial_electricity_flow_FI_to_SE1(start_time = start,
                                            end_time = end,
                                            user_key = key)
summary(df)

## End(Not run)
```

commercial_electricity_flow_FI_to_SE3 *Commercial electricity flow between Finland and Mid Sweden (FI-SE3)*

Description

Check https://data.fingrid.fi/en/dataset/commercial-flow-fi-se3

Usage

```
commercial_electricity_flow_FI_to_SE3(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains commercial electricity flow (dayahead market and intraday market) between Finland (FI) and Central Sweden (SE3). Positive sign is export from Finland to Sweden.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- commercial_electricity_flow_FI_to_SE3(start_time = start,
                                            end_time = end,
                                            user_key = key)
summary(df)

## End(Not run)
```

condensing_power_production_RTD *Condensing power production - real time data*

Description

Check https://data.fingrid.fi/en/dataset/condensing-power-production-real-time-data

Usage

```
condensing_power_production_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains condensing power production based on the real-time measurements in Fingrid's operation control system. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- condensing_power_production_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

congestion_income_FI_EE

Congestion income between Finland and Estonia

Description

Check https://data.fingrid.fi/en/dataset/congestion-income-between-finland-and-estonia

Usage

```
congestion_income_FI_EE(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains congestion income between Finland (FI) and Estonia (EE).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- congestion_income_FI_EE(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

congestion_income_FI_SE1

Congestion income between FI-SE1

Description

Check https://data.fingrid.fi/en/dataset/congestion-income-between-fi-se1

Usage

```
congestion_income_FI_SE1(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains congestion income between Finland (FI) and Northern Sweden (SE1).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- congestion_income_FI_SE1(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

---

congestion_income_FI_SE3

Congestion income between FI and SE3

Description

Check https://data.fingrid.fi/en/dataset/congestion-income-between-fi-se3

Usage

```
congestion_income_FI_SE3(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains congestion income between Finland (FI) and Central Sweden (SE3).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- congestion_income_FI_SE3(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

---

consumption_imbalance_electricity_price

The price of comsumption imbalance electricity

Description

Check https://data.fingrid.fi/en/dataset/the-price-of-comsumption-imbalance-electricity

Usage

```
consumption_imbalance_electricity_price(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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. Separate consumption imbalance ended when 1.11.2021 01.00 settlement model was changed to single imbalance.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- consumption_imbalance_electricity_price(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

---

day_ahead_transmission_capacity_EE_to_FI

Day-ahead transmission capacity EE-FI

Description

Check https://data.fingrid.fi/en/dataset/intra-day-transmission-capacity-ee-fi

Usage

```
day_ahead_transmission_capacity_EE_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- day_ahead_transmission_capacity_EE_to_FI(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`day_ahead_transmission_capacity_FI_to_EE`
Day-ahead transmission capacity FI-EE

Description

Check https://data.fingrid.fi/en/dataset/indra-day-transmission-capacity-fi-ee

Usage

```
day_ahead_transmission_capacity_FI_to_EE(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- day_ahead_transmission_capacity_FI_to_EE(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`day_ahead_transmission_capacity_FI_to_SE1`
Day-ahead transmission capacity FI-SE1

Description

Check https://data.fingrid.fi/en/dataset/vuorokausimarkkinoille-annettu-siirtokapasiteetti-fi-se1

Usage

```
day_ahead_transmission_capacity_FI_to_SE1(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Day-ahead transmission capacity from Finland (FI) to North-Sweden (SE1). Transmission capacity is given hourly for every hour of the next day.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- day_ahead_transmission_capacity_FI_to_SE1(start_time = start,
                                                end_time = end,
                                                user_key = key)
summary(df)

## End(Not run)
```

`day_ahead_transmission_capacity_FI_to_SE3`

Day-ahead transmission capacity FI-SE3

Description

Check https://data.fingrid.fi/en/dataset/vuorokausimarkkinoille-annettu-siirtokapasiteetti-fi-se3

Usage

```
day_ahead_transmission_capacity_FI_to_SE3(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Day-ahead transmission capacity from Finland (FI) to Central-Sweden (SE3). Transmission capacity is given hourly for every hour of the next day.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
```

```
df <- day_ahead_transmission_capacity_FI_to_SE3(start_time = start,
                                                end_time = end,
                                                user_key = key)
summary(df)

## End(Not run)
```

---

day_ahead_transmission_capacity_SE1_to_FI
Day-ahead transmission capacity SE1-FI

Description

Check https://data.fingrid.fi/en/dataset/intra-day-transmission-capacity-se1-fi

Usage

```
day_ahead_transmission_capacity_SE1_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Day-ahead transmission capacity from North-Sweden (SE1) to Finland (FI). Transmission capacity is given hourly for every hour of the next day.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- day_ahead_transmission_capacity_SE1_to_FI(start_time = start,
                                                end_time = end,
                                                user_key = key)
summary(df)

## End(Not run)
```

day_ahead_transmission_capacity_SE3_to_FI
Day-ahead transmission capacity SE3-FI

Description

Check https://data.fingrid.fi/en/dataset/vuorokausimarkkinoille-annettu-siirtokapasiteetti-se3-fi

Usage

```
day_ahead_transmission_capacity_SE3_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Day-ahead transmission capacity from Central-Sweden (SE3) to Finland (FI). Transmission capacity is given hourly for every hour of the next day.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- day_ahead_transmission_capacity_SE3_to_FI(start_time = start,
                                                end_time = end,
                                                user_key = key)
summary(df)

## End(Not run)
```

`down_regulation_price_balancing_energy_market` *Down-regulation price in the Balancing energy market*

Description

Check https://data.fingrid.fi/en/dataset/down-regulation-price-in-the-balancing-energy-market

Usage

```
down_regulation_price_balancing_energy_market(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- down_regulation_price_balancing_energy_market(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_consumption_FI` *Electricity consumption in Finland*

Description

Check https://data.fingrid.fi/en/dataset/electricity-consumption-in-finland

Usage

```
electricity_consumption_FI(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains electricity 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. Updated hourly.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_consumption_FI(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_consumption_FI_RTD` *Electricity consumption in Finland - real time data*

Description

Check https://data.fingrid.fi/en/dataset/electricity-consumption-in-finland-real-time-data

Usage

```
electricity_consumption_FI_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_consumption_FI_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_consumption_forecast_hourly_updated` *Electricity consumption forecast of Finland. Forecast is updated hourly*

Description

Check https://data.fingrid.fi/en/dataset/updated-electricity-consumption-forecast-of-finland

Usage

```
electricity_consumption_forecast_hourly_updated(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains electricity consumption forecast of Finland. The forecast is made by Fingrid and updated hourly.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_consumption_forecast_hourly_updated(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_consumption_forecast_next_24h` *Electricity consumption forecast for the next 24 hours.*

Description

Check https://data.fingrid.fi/en/dataset/an-hourly-comsumption-forecast-for-the-next-24-hours

Usage

```
electricity_consumption_forecast_next_24h(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains an hourly consumption forecast for the next 24 hours made by Fingrid. Forecast is published on previous day at 12:00 EET.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_consumption_forecast_next_24h(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_production_FI` *Electricity production in Finland*

Description

Check https://data.fingrid.fi/en/dataset/electricity-production-in-finland

Usage

```
electricity_production_FI(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hourly electricity production in Finland are based on Fingrid's measurements. Minor part of production which is not measured is estimated. Updated hourly.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_production_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_production_FI_RTD` *Electricity production in Finland - real time data*

Description

Check https://data.fingrid.fi/en/dataset/electricity-production-in-finland-real-time-data

Usage

```
electricity_production_FI_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains electricity production in Finland based on the real-time measurements in Fingrid's operation control system The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_production_FI_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_production_prediction_FI` *Finland's electricity production prediction based on production plans informed to Fingrid*

Description

Check https://data.fingrid.fi/en/dataset/finland-electricity-production-prediction-based-on-production-plans-informed-to-fingrid

Usage

```
electricity_production_prediction_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the calculation of production forecast in Finland, which is based on the production plans that balance responsible parties have reported to Fingrid. Production forecast is updated hourly.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_production_prediction_FI(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`electricity_production_prediction_FI_next_24h_as_hourly_energy` *A tentative production prediction for the next 24 hours as an hourly energy*

Description

Check https://data.fingrid.fi/en/dataset/tentative-production-prediction-for-the-next-24-hours-as-an-hourly-energy

Usage

```
electricity_production_prediction_FI_next_24h_as_hourly_energy(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hourly electricity generation forecast, which 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 hourly.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- electricity_production_prediction_FI_next_24h_as_hourly_energy(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`emission_factor_electricity_consumed_FI_RTD` *Emission factor for electricity consumed in Finland - real time data*

Description

Check https://data.fingrid.fi/en/dataset/suomessa-kulutetun-sahkon-paastokerroin-reaaliaikatieto

Usage

```
emission_factor_electricity_consumed_FI_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- emission_factor_electricity_consumed_FI_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`emission_factor_electricity_production_FI_RTD` *Emission factor of electricity production in Finland - real time data*

Description

Check https://data.fingrid.fi/en/dataset/suomen-sahkontuotannon-paastokerroin-reaaliaikatieto

Usage

```
emission_factor_electricity_production_FI_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- emission_factor_electricity_production_FI_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

exchange_trade_FI_RUS *Exchange trade between Finland and Russia*

Description

Check https://data.fingrid.fi/en/dataset/stock-exchange-between-finland-and-russia

Usage

```
exchange_trade_FI_RUS(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains direct trade volumes derive from freely placed bids in the Nordic day-ahead (Elspot) and intraday (Elbas) electricity markets. Information is updated once the day-ahead market results are public. Information on the intraday trade is updated before the operational hour.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- exchange_trade_FI_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRD_hourly_market_prices *Frequency containment reserves for disturbances, hourly market prices*

Description

Check https://data.fingrid.fi/en/dataset/frequency-containment-reserves-for-disturbances-hourly-market-prices

Usage

```
FCRD_hourly_market_prices(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hourly prices (EUR/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).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRD_hourly_market_prices(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRD_nordic_trade *Frequency containment reserves for disturbances, nordic trade*

Description

Check https://data.fingrid.fi/en/dataset/taajuusohjattu-hairioreservi-ulkomaankauppa

Usage

```
FCRD_nordic_trade(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRD_nordic_trade(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRD_procured_volumes_hourly_market *Frequency containment reserve for disturbances, procured volumes in hourly market*

Description

Check https://data.fingrid.fi/en/dataset/frequency-containment-reserve-for-disturbances-procured-volumes-in-hourly-market

Usage

```
FCRD_procured_volumes_hourly_market(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRD_procured_volumes_hourly_market(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRD_received_bids_hourly_market

Frequency containment reserve for disturbances, received bids in hourly market

Description

Check https://data.fingrid.fi/en/dataset/taajuusohjattu-hairioreservi-tarjousmaarat-tuntimarkkinoilta

Usage

```
FCRD_received_bids_hourly_market(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRD_received_bids_hourly_market(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRD_reserve_plans_yearly_market *Frequency containment reserves for disturbances, reserve plans in the yearly market*

Description

Check https://data.fingrid.fi/en/dataset/taajuusohjattu-hairioreservi-vuosimarkkinasuunnitelmat

Usage

```
FCRD_reserve_plans_yearly_market(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRD_reserve_plans_yearly_market(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRN_foreign_trade *Frequency Containment Reserve for Normal operation, foreign trade*

Description

Check https://data.fingrid.fi/en/dataset/taajuusohjattu-kayttoreservi-ulkomaankauppa

Usage

```
FCRN_foreign_trade(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRN_foreign_trade(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRN_hourly_market_prices *Frequency containment reserve for normal operation, hourly market prices*

Description

Check https://data.fingrid.fi/en/dataset/frequency-containment-reserve-for-normal-operation-prices

Usage

```
FCRN_hourly_market_prices(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hourly prices (EUR/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).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRN_hourly_market_prices(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`FCRN_procured_volumes_hourly_market` *Frequency containment reserves for normal operation, procured volumes in hourly market*

Description

Check https://data.fingrid.fi/en/dataset/frequency-containment-reserves-for-normal-operation-procured-volumes-in-hourly-market

Usage

```
FCRN_procured_volumes_hourly_market(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRN_procured_volumes_hourly_market(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FCRN_received_bids_hourly_market *Frequency containment reserves for normal operation, received bids in hourly market*

Description

Check https://data.fingrid.fi/en/dataset/taajuusohjattu-kayttoreservi-tarjousmaarat-tuntimarkkinoilta

Usage

```
FCRN_received_bids_hourly_market(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRN_received_bids_hourly_market(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

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

Description

Check https://data.fingrid.fi/en/dataset/taajuusohjattu-kayttoreservi-vuosimarkkinasuunnitelmat

Usage

```
FCRN_yearly_market_plans(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FCRN_yearly_market_plans(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FFR_price *Fast Frequency Reserve FFR, price*

Description

Check https://data.fingrid.fi/en/dataset/nopea-taajuusreservi-hinta

Usage

```
FFR_price(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the price of procured Fast Frequency Reserve (FFR) (EUR/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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FFR_price(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FFR_procured_volume *Fast Frequency Reserve FFR, procured volume*

Description

Check https://data.fingrid.fi/en/dataset/nopea-taajuusreservi-hankintamaara

Usage

```
FFR_procured_volume(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FFR_procured_volume(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FFR_procurement_forecast *Fast Frequency Reserve FFR, procurement forecast*

Description

Check https://data.fingrid.fi/en/dataset/nopea-taajuusreservi-hankintaennuste

Usage

```
FFR_procurement_forecast(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FFR_procurement_forecast(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

FFR_received_bids *Fast Frequency Reserve FFR, received bids*

Description

Check https://data.fingrid.fi/en/dataset/nopea-taajuusreservi-tarjoukset

Usage

```
FFR_received_bids(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- FFR_received_bids(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`frequency_RTD` *Frequency - real time data*

Description

Check https://data.fingrid.fi/en/dataset/frequency-real-time-data

Usage

```
frequency_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains frequency of the power system based on the real-time measurements in Fingrid's operation control system. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- frequency_RTD(
    start_time = start,
    end_time = 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

```
get_data(api_number = NA, start_time = NA, end_time = NA, user_key = NA)
```

Arguments

api_number	Integer related to the Fingrid Open Data API
start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains wanted open data.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- get_data(api_number = 124,  # electricity demand for Finland
               start_time = start,
               end_time = end,
               user_key = key)
summary(df)

## End(Not run)
```

hour_change_regulation_down_regulation
Hour change regulation, down-regulation

Description

Check https://data.fingrid.fi/en/dataset/tunninvaihdesaato-alassaato

Usage

```
hour_change_regulation_down_regulation(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hour change regulation, down-regulation. 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- hour_change_regulation_down_regulation(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`hour_change_regulation_up_regulation` *Hour change regulation, up-regulation*

Description

Check https://data.fingrid.fi/en/dataset/hour-change-regulation-up-regulation

Usage

```
hour_change_regulation_up_regulation(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Hour change regulation, up-regulation. 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 transfered to begin 15 minutes before or after the planned moment.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- hour_change_regulation_up_regulation(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

hydro_power_production_RTD *Hydro power production - real time data*

Description

Check https://data.fingrid.fi/en/dataset/hydro-power-production-real-time-data

Usage

```
hydro_power_production_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hydro power production in Finland based on the real-time measurements in Fingrid's operation control system. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- hydro_power_production_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`imbalance_power_FI_to_SE` *Imbalance power between Finland and Sweden*

Description

Check https://data.fingrid.fi/en/dataset/imbalance-power-between-finland-and-sweden

Usage

```
imbalance_power_FI_to_SE(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- imbalance_power_FI_to_SE(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

industrial_cogeneration_RTD *Industrial cogeneration - real time data*

Description

Check https://data.fingrid.fi/en/dataset/industrial-cogeneration-real-time-data

Usage

```
industrial_cogeneration_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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).

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- industrial_cogeneration_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`intraday_transmission_capacity_EE_to_FI_RTD` *Real time intraday transmission capacity EE-FI*

Description

Check https://data.fingrid.fi/en/dataset/real-time-transmission-capacity-to-be-given-to-intraday-market-ee-fi

Usage

```
intraday_transmission_capacity_EE_to_FI_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- intraday_transmission_capacity_EE_to_FI_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`intraday_transmission_capacity_FI_to_EE_RTD` *Real time transmission capacity available for the intraday market FI-EE*

Description

Check https://data.fingrid.fi/en/dataset/real-time-transmission-capacity-to-be-given-to-intraday-market-fi-ee

Usage

```
intraday_transmission_capacity_FI_to_EE_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- intraday_transmission_capacity_FI_to_EE_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`intraday_transmission_capacity_FI_to_RUS` *Intraday transmission capacity FI-RUS*

Description

Check https://data.fingrid.fi/en/dataset/intraday-transmission-capacity-fi-rus

Usage

```
intraday_transmission_capacity_FI_to_RUS(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the capacity given to intraday market means transfer capacity after day-ahead trade from Finland (FI) to Russia (RUS). The indraday capacity between Finland and Russia is updated once a day. The data will not be revised after hourly day-ahead trade.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- intraday_transmission_capacity_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

intraday_transmission_capacity_RUS_to_FI
Intraday transmission capacity RUS-FI

Description

Check https://data.fingrid.fi/en/dataset/intraday-transmission-capacity-rus-fi

Usage

```
intraday_transmission_capacity_RUS_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the capacity given to intraday market means transfer capacity after day-ahead trade from Russia to Finland. The intraday capacity between Finland and Russia is updated once a day.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- intraday_transmission_capacity_RUS_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

kinetic_energy_nordic_power_system_RTD *Kinetic energy of the Nordic power system - real time data*

Description

Check https://data.fingrid.fi/en/dataset/kinetic-energy-nordic-realtime

Usage

```
kinetic_energy_nordic_power_system_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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 2015/3/27 available.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- kinetic_energy_nordic_power_system_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

last_activated_up_regulation_bid
Price of last activated up-regulation bid, real-time publication

Description

Check https://data.fingrid.fi/en/dataset/real-time-price-of-up-regulation

Usage

```
last_activated_up_regulation_bid(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains The price of the last activated up-regulation bid. The price is published real-time when Finland is a separate regulation area.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- last_activated_up_regulation_bid(start_time = start,
                                       end_time = end,
                                       user_key = key)
summary(df)

## End(Not run)
```

`measured_electrical_transmission_FI_to_Aland` *Measured electrical transmission between Finland and Åland*

Description

Check https://data.fingrid.fi/en/dataset/measured-electrical-transmission-between-finland-and-aland

Usage

```
measured_electrical_transmission_FI_to_Aland(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains measured electrical transmission between Finland and Åland islands DC tie line. Positive sign means transmission from Finland to Åland. Negative sign means transmission from Åland to Finland. The value is updated once a day before noon with the values of the previous day.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- measured_electrical_transmission_FI_to_Aland(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

measured_electrical_transmission_FI_to_EE
Measured electrical transmission between Finland and Estonia

Description

Check https://data.fingrid.fi/en/dataset/measured-electrical-transmission-between-finland-and-estonia

Usage

```
measured_electrical_transmission_FI_to_EE(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- measured_electrical_transmission_FI_to_EE(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`measured_electrical_transmission_FI_to_NO` *Measured electrical transmission between Finland and Norway*

Description

Check https://data.fingrid.fi/en/dataset/measured-electrical-transmission-between-finland-and-norway

Usage

```
measured_electrical_transmission_FI_to_NO(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains measured 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- measured_electrical_transmission_FI_to_NO(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`measured_electrical_transmission_FI_to_RUS` *Measured transmission of electricity between Finland and Russia*

Description

Check https://data.fingrid.fi/en/dataset/measured-transmission-of-electricity-between-finland-and-russia

Usage

```
measured_electrical_transmission_FI_to_RUS(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains measured electrical transmission between Finland and Russia. Positive sign means transmission from Finland to Russia. Negative sign means transmission from Russia to Finland.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- measured_electrical_transmission_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`measured_electrical_transmission_FI_to_SE1` *Measured transmission of electiricity between Finland and Northern Sweden*

Description

Check https://data.fingrid.fi/en/dataset/measured-transmission-of-electiricity-between-finland-and-northern-sweden

Usage

```
measured_electrical_transmission_FI_to_SE1(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains measured 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- measured_electrical_transmission_FI_to_SE1(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`measured_electrical_transmission_FI_to_SE3` *Measured electrical transmission between Finland and Central Sweden*

Description

Check https://data.fingrid.fi/en/dataset/measured-electrical-transmission-between-finland-and-central-sweden

Usage

```
measured_electrical_transmission_FI_to_SE3(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains measured electrical transmission between Finland and Central Sweden (SE3) high voltage direct current tie lines. Positive sign means transmission from Finland to Central Sweden (SE3). Negative sign means transmission from Central Sweden (SE3) to Finland.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- measured_electrical_transmission_FI_to_SE3(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

measured_electricity_P1_north_to_south
Measured electricity energy in Finland from north to south

Description

Check https://data.fingrid.fi/en/dataset/measured-electricity-energy-in-finland-from-north-to-south

Usage

```
measured_electricity_P1_north_to_south(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains measured electricity flow in North-South cut in Finland (cut P1). In the graph flow from North to South is positive.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- measured_electricity_P1_north_to_south(start_time = start,
                                             end_time = end,
                                             user_key = key)
summary(df)

## End(Not run)
```

net_import_or_export_electricity_RTD *Net import/export of electricity - real time data*

Description

Check https://data.fingrid.fi/en/dataset/net-import-export-of-electricity-real-time-data

Usage

```
net_import_or_export_electricity_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains net import to Finland and net export from Finland. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- net_import_or_export_electricity_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

nuclear_power_production_RTD *Nuclear power production - real time data*

Description

Check https://data.fingrid.fi/en/dataset/nuclear-power-production-real-time-data

Usage

```
nuclear_power_production_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains nuclear power production in Finland based on the real-time measurements in Fingrid's operation control system. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- nuclear_power_production_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

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

Description

Check https://data.fingrid.fi/en/dataset/ordered-down-regulations-from-balancing-market-in-finland

Usage

```
ordered_down_regulations_balancing_energy_market_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- ordered_down_regulations_balancing_energy_market_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`ordered_up_regulations_balancing_energy_market_FI` *Ordered up-regulations from Balancing energy market in Finland*

Description

Check https://data.fingrid.fi/en/dataset/ordered-up-regulations-from-balancing-energy-market-in-finland

Usage

```
ordered_up_regulations_balancing_energy_market_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- ordered_up_regulations_balancing_energy_market_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

other_power_transactions_down_regulation
Other power transactions, down-regulation

Description

Check https://data.fingrid.fi/en/dataset/other-power-transactions-down-regulation

Usage

```
other_power_transactions_down_regulation(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains other power transactions which are necessary in view of the power system.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- other_power_transactions_down_regulation(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

other_power_transactions_up_regulation
Other power transactions, up-regulation

Description

Check https://data.fingrid.fi/en/dataset/other-power-transactions-up-regulation

Usage

```
other_power_transactions_up_regulation(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains other power transactions which are necessary in view of the power system.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- other_power_transactions_up_regulation(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

other_production_RTD *Other production inc. estimated small-scale production and reserve power plants - real time data*

Description

Check https://data.fingrid.fi/en/dataset/gas-turbine-and-estimated-small-scale-production-real-time-data

Usage

```
other_production_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- other_production_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

peak_load_power_RTD *Peak load power - real time data*

Description

Check https://data.fingrid.fi/en/dataset/peak-load-power-real-time-data

Usage

```
peak_load_power_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- peak_load_power_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`planned_day_ahead_transmission_capacity_FI_to_SE1`
Planned day-ahead transmission capacity FI-SE1

Description

Check https://data.fingrid.fi/en/dataset/planned-transmission-capacity-fi-se1

Usage

```
planned_day_ahead_transmission_capacity_FI_to_SE1(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains planned day-ahead transmission capacity from Finland (FI) to North-Sweden (SE1). Transmission capacity is given hourly for every next week hour.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- planned_day_ahead_transmission_capacity_FI_to_SE1(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`planned_day_ahead_transmission_capacity_FI_to_SE3`
Planned day-ahead transmission capacity FI-SE3

Description

Check https://data.fingrid.fi/en/dataset/suunniteltu-vuorokausimarkkinoille-annettava-siirtokapasiteetti-fi-se3

Usage

```
planned_day_ahead_transmission_capacity_FI_to_SE3(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains planned day-ahead transmission capacity from Finland (FI) to Central-Sweden (SE3). Transmission capacity is given hourly for every next week hour.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- planned_day_ahead_transmission_capacity_FI_to_SE3(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

planned_day_ahead_transmission_capacity_SE1_to_FI
Planned day-ahead transmission capacity SE1-FI

Description

Check https://data.fingrid.fi/en/dataset/planned-transmission-capacity-se1-fi

Usage

```
planned_day_ahead_transmission_capacity_SE1_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains planned day-ahead transmission capacity from North-Sweden (SE1) to Finland (FI). Transmission capacity is given hourly for every next week hour.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- planned_day_ahead_transmission_capacity_SE1_to_FI(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`planned_day_ahead_transmission_capacity_SE3_to_FI` *Planned day-ahead transmission capacity SE3-FI*

Description

Check https://data.fingrid.fi/en/dataset/planned-day-ahead-transmission-capacity-se3-fi

Usage

```
planned_day_ahead_transmission_capacity_SE3_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains planned day-ahead transmission capacity from Central-Sweden (SE3) to Finland (FI). Transmission capacity is given hourly for every next week hour.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- planned_day_ahead_transmission_capacity_SE3_to_FI(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

planned_transmission_capacity_FI_to_RUS
Planned transmission capacity FI-RUS

Description

Check https://data.fingrid.fi/en/dataset/planned-transmission-capacity-fi-rus

Usage

```
planned_transmission_capacity_FI_to_RUS(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains planned transmission capacity from Finland to Russia. Transmission capacity is given hourly for every next week hour.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- planned_transmission_capacity_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

planned_transmission_capacity_RUS_to_FI
Planned transmission capacity RUS-FI

Description

Check https://data.fingrid.fi/en/dataset/planned-transmission-capacity-rus-fi

Usage

```
planned_transmission_capacity_RUS_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains planned transmission capacity from Russia to Finland. Transmission capacity is given hourly for every next week hour.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- planned_transmission_capacity_RUS_to_FI(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

power_system_state_RTD *Power system state - real time data*

Description

Check https://data.fingrid.fi/en/dataset/power-system-state-real-time-data

Usage

```
power_system_state_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains different states of the power system - traffic lights: 1=green, 2=yellow, 3=red, 4=black, 5=blue. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- power_system_state_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

price_last_activated_down_regulation_bid_RTD
Price of last activated down-regulation bid, real-time publication

Description

Check https://data.fingrid.fi/en/dataset/viimeksi-aktivoidun-alassaatotarjouksen-hinta-reaaliaikainen-julkaisu

Usage

```
price_last_activated_down_regulation_bid_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the price of the last activated down-regulation bid. The price is published real-time when Finland is a separate regulation area.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- price_last_activated_down_regulation_bid_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

procured_aFRR_capacity_down
Procured automatic frequency restoration reserve Capacity, down

Description

Check https://data.fingrid.fi/en/dataset/procured-automatic-frequency-restoration-reserve-capacity-down

Usage

```
procured_aFRR_capacity_down(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Procured automatic Frequency Restoration Reserve (aFRR / FRR-A) capacity, down in MW.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- procured_aFRR_capacity_down(start_time = start,
                                  end_time = end,
                                  user_key = key)
summary(df)

## End(Not run)
```

`procured_aFRR_capacity_down_price` *Procured automatic frequency restoration reserve capacity, price, down*

Description

Check https://data.fingrid.fi/en/dataset/procured-afrr-capacity-price-down

Usage

```
procured_aFRR_capacity_down_price(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains volume weighted average price for procured downward automatic Frequency Restoration Reserve (aFRR) capacity, in EUR/MW.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- procured_aFRR_capacity_down_price(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

procured_aFRR_capacity_up *Procured automatic frequency restoration reserve capacity, up*

Description

Check https://data.fingrid.fi/en/dataset/procured-automatic-frequency-restoration-reserve-capacity-up

Usage

```
procured_aFRR_capacity_up(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Procured automatic Frequency Restoration Reserve (aFRR) capacity, up in MW.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- procured_aFRR_capacity_up(start_time = start,
                                end_time = end,
                                user_key = key)
summary(df)

## End(Not run)
```

`procured_aFRR_capacity_up_price` *Procured a FRR capacity price, up*

Description

Check https://data.fingrid.fi/en/dataset/procured-a-frr-capacity-price-up

Usage

```
procured_aFRR_capacity_up_price(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains volume weighted average price for procured upward automatic Frequency Restoration Reserve (aFRR) capacity, in EUR/MW.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- procured_aFRR_capacity_up_price(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

production_imbalance_electricity_buying_price
The buying price of production imbalance electricity

Description

Check https://data.fingrid.fi/en/dataset/the-bying-price-of-production-imbalance-electricity

Usage

```
production_imbalance_electricity_buying_price(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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 setllement model was changed to single imbalance.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- production_imbalance_electricity_buying_price(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`production_imbalance_electricity_sales_price` *The sales price of production imbalance electricity*

Description

Check https://data.fingrid.fi/en/dataset/the-sales-price-of-production-imbalance-electricity

Usage

```
production_imbalance_electricity_sales_price(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- production_imbalance_electricity_sales_price(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

production_surplus_or_deficit_FI_RTD
Production surplus/deficit in Finland - Real time

Description

Check data https://data.fingrid.fi/en/dataset/production-surplus-deficit-in-finland-real-time-data

Usage

```
production_surplus_or_deficit_FI_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- production_surplus_or_deficit_FI_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`solar_power_generation_forecast_updated_daily` *Solar power generation forecast - updated once a day*

Description

Check https://data.fingrid.fi/en/dataset/solar-power-generation-forecast-updated-once-a-day

Usage

```
solar_power_generation_forecast_updated_daily(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- solar_power_generation_forecast_updated_daily(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`solar_power_generation_forecast_updated_hourly` *Solar power generation forecast - updated hourly*

Description

Check https://data.fingrid.fi/en/dataset/solar-power-generation-forecast-updated-every-hour

Usage

```
solar_power_generation_forecast_updated_hourly(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains hourly updated solar power generation forecast for the next 36 hours. 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- solar_power_generation_forecast_updated_hourly(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

special_regulation_down_regulation
Special regulation, down-regulation

Description

Check https://data.fingrid.fi/en/dataset/erikoissaato-alassaato

Usage

```
special_regulation_down_regulation(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains regulation which takes place in the regulating power market by Fingrid for reasons other than the needs of national balance management

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- special_regulation_down_regulation(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

special_regulation_up_regulation
Special regulation, up-regulation

Description

Check https://data.fingrid.fi/en/dataset/special-regulation-up-regulation

Usage

```
special_regulation_up_regulation(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains regulation which takes place in the regulating power market by Fingrid for reasons other than the needs of national balance management

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- special_regulation_up_regulation(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

stock_exchange_capacity_FI_to_RUS
Stock exchange capacity FI-RUS

Description

Check https://data.fingrid.fi/en/dataset/stock-exchange-capacity-fi-rus

Usage

```
stock_exchange_capacity_FI_to_RUS(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the capacity on the 400 kV connection from Finland to Russia is reserved to direct trade of the following commercial day. Fingrid and the Russian parties, who have jointly agreed that the capacity is 140 MW in both directions, daily confirm the capacity.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- stock_exchange_capacity_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

stock_exchange_capacity_RUS_to_FI *Stock exchange capacity RUS-FI*

Description

Check https://data.fingrid.fi/en/dataset/stock-exchange-capacity-rus-fi

Usage

```
stock_exchange_capacity_RUS_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the capacity on the 400 kV connection from Russia to Finland is reserved to direct trade of the following commercial day. Fingrid and the Russian parties, who have jointly agreed that the capacity is 140 MW in both directions, daily confirm the capacity.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- stock_exchange_capacity_RUS_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`sum_down_regulation_bids_balancing_energy_market` *The sum of the down-regulation bids in the Balancing energy market*

Description

Check https://data.fingrid.fi/en/dataset/the-sum-of-the-down-regualtion-bids-in-the-balancing-energy-market

Usage

```
sum_down_regulation_bids_balancing_energy_market(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the hourly sum of the down-regulation offers given by Finnish parties to the Balancing energy market is published hourly with one hour delay, eg. information from hour 07-08 is published at 9 o'clock.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- sum_down_regulation_bids_balancing_energy_market(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

sum_up_regulation_bids_balancing_energy_market
The sum of the up-regulation bids in the balancing energy market.

Description

Check https://data.fingrid.fi/en/dataset/the-sum-of-the-up-regulation-bids-in-the-balancing-energy-market

Usage

```
sum_up_regulation_bids_balancing_energy_market(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the hourly sum of the up-regulation offers given by Finnish parties to the Balancing energy market, which is published hourly with one hour delay, eg. information from hour 07-08 is published at 9 o'clock.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- sum_up_regulation_bids_balancing_energy_market(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

surplus_or_deficit_cumulative_RTD
Surplus/deficit, cumulative - real time data

Description

Check https://data.fingrid.fi/en/dataset/surplus-deficit-cumulative-real-time-data

Usage

```
surplus_or_deficit_cumulative_RTD(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- surplus_or_deficit_cumulative_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

temperature_helsinki_RTD *Temperature in Helsinki - real time data*

Description

Check https://data.fingrid.fi/en/dataset/temperature-in-helsinki-real-time-data

Usage

```
temperature_helsinki_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains outside air temperature measurement at Tammisto substation. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- temperature_helsinki_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`temperature_jyvaskyla_RTD` *Temperature in Jyväskylä - real time data*

Description

Check https://data.fingrid.fi/en/dataset/temperature-in-jyvaskyla-real-time-data

Usage

```
temperature_jyvaskyla_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains outside air temperature measurement at Petäjävesi substation. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- temperature_jyvaskyla_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`temperature_oulu_RTD` *Temperature in Oulu - real time data*

Description

Check https://data.fingrid.fi/en/dataset/temperature-in-oulu-real-time-data

Usage

```
temperature_oulu_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains outside air temperature measurement at Leväsuo substation. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- temperature_oulu_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

temperature_rovaniemi_RTD *Temperature in Rovaniemi - real time data*

Description

Check https://data.fingrid.fi/en/dataset/temperature-in-rovaniemi-real-time-data

Usage

```
temperature_rovaniemi_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains outside air temperature measurement at Valajaskoski substation. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- temperature_rovaniemi_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`time_deviation_RTD` *Time deviation - real time data*

Description

Check https://data.fingrid.fi/en/dataset/time-deviation-real-time-data

Usage

```
time_deviation_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- time_deviation_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`total_solar_production_used_in_forecast` *Total solar production capacity used in the solar power forecast*

Description

Check https://data.fingrid.fi/en/dataset/total-solar-production-capacity

Usage

```
total_solar_production_used_in_forecast(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- total_solar_production_used_in_forecast(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`total_wind_production_used_in_forecast` *Total wind production capacity used in the wind power forecast*

Description

Check https://data.fingrid.fi/en/dataset/total-wind-production-capacity

Usage

```
total_wind_production_used_in_forecast(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the total wind production capacity used in Fingrid's wind power forecast. It is based on capacity information gathered by Fingrid.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- total_wind_production_used_in_forecast(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_Aland_to_SE_RTD` *Transmission between Sweden and Åland - real time data*

Description

Check https://data.fingrid.fi/en/dataset/transmission-between-sweden-and-aland-real-time-data

Usage

```
transmission_Aland_to_SE_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_Aland_to_SE_RTD(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

transmission_capacity_FI_to_RUS
Transmission capacity FI-RUS

Description

Check https://data.fingrid.fi/en/dataset/summakapasiteetti-fi-rus

Usage

```
transmission_capacity_FI_to_RUS(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the total commercial transmission capacity of the 400 kV transmission lines from Finland to Russia owned by Fingrid. The technical capacity on 400 kV lines from Russia to Finland is 1400 MW or 1000 MW, depending whether the NWPP power plant that is located in St. Petersburg area is connected to the Finnish or the Russian power system. Fingrid has reserved 100 MW of transmission capacity from Russia to Finland to buy reserve power. The technical maximum capacity from Finland to Russia is 350 MW, of which Fingrid has reserved 30 MW to buy reserve power.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_capacity_intraday_market_FI_to_EE` *Transmission capacity given to intraday market FI-EE*

Description

Check https://data.fingrid.fi/en/dataset/intraday-markkinoille-annettu-siirtokapasiteetti-ee-fi

Usage

```
transmission_capacity_intraday_market_FI_to_EE(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains transmission capacity to be given to intraday market FI-EE.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_intraday_market_FI_to_EE(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_capacity_intraday_market_FI_to_SE1` *Transmission capacity for intraday market from Finland to Northern Sweden (FI - SE1)*

Description

Check https://data.fingrid.fi/en/dataset/transmission-capacity-to-be-given-to-intraday-market-fi-se1

Usage

```
transmission_capacity_intraday_market_FI_to_SE1(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_intraday_market_FI_to_SE1(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_capacity_intraday_market_FI_to_SE3` *Transmission capacity for intraday market from Finland to Mid Sweden (FI - SE3)*

Description

Check https://data.fingrid.fi/en/dataset/transmission-capacity-to-be-given-to-intraday-market-fi-se3

Usage

```
transmission_capacity_intraday_market_FI_to_SE3(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_intraday_market_FI_to_SE3(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_capacity_intraday_market_SE1_to_FI` *Transmission capacity for intraday market from Northern Sweden to Finland (SE1-FI)*

Description

Check https://data.fingrid.fi/en/dataset/transmission-capacity-to-be-given-to-intraday-market-se1-fi

Usage

```
transmission_capacity_intraday_market_SE1_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_intraday_market_SE1_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_capacity_intraday_market_SE3_to_FI` *Transmission capacity for intraday market from Mid Sweden and Finland (SE3-FI)*

Description

Check https://data.fingrid.fi/en/dataset/transmission-capacity-to-be-given-to-intraday-market-se3-fi

Usage

```
transmission_capacity_intraday_market_SE3_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_intraday_market_SE3_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

transmission_capacity_RUS_to_FI
Transmission capacity RUS-FI

Description

Check https://data.fingrid.fi/en/dataset/transmission-capacity-rus-fi

Usage

```
transmission_capacity_RUS_to_FI(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains the total commercial transmission capacity of the 400 kV transmission lines from Russia to Finland owned by Fingrid.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_RUS_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_capacity_to_be_given_intraday_market_EE_to_FI` *Transmission capacity to be given to intraday market EE-FI*

Description

Check https://data.fingrid.fi/en/dataset/transmission-capacity-to-be-given-to-intraday-market-ee-fi

Usage

```
transmission_capacity_to_be_given_intraday_market_EE_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains transmission capacity to be given to intraday market EE - FI

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_capacity_to_be_given_intraday_market_EE_to_FI(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

transmission_FI_to_EE_RTD *Transmission between Finland and Estonia - real time data*

Description

Check https://data.fingrid.fi/en/dataset/transmission-between-finland-and-estonia-real-time-data

Usage

```
transmission_FI_to_EE_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_FI_to_EE_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_FI_to_NO_RTD` *Transmission between Finland and Norway - real time data*

Description

Check https://data.fingrid.fi/en/dataset/transmission-between-finland-and-norway-real-time-data

Usage

```
transmission_FI_to_NO_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_FI_to_NO_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

transmission_FI_to_RUS_RTD *Transmission between Finland and Russia - real time data*

Description

Check https://data.fingrid.fi/en/dataset/transmission-between-finland-and-russia-real-time-data

Usage

```
transmission_FI_to_RUS_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains power transmission between Finland and Russia based on the real-time measurements in Fingrid's operation control system. Positive sign means transmission from Finland to Russia. Negative sign means transmission from Russia to Finland. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_FI_to_RUS_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`transmission_FI_to_SE1_RTD` *Transmission between Finland and Northern Sweden - real time data*

Description

Check https://data.fingrid.fi/en/dataset/transmission-between-finland-and-northern-sweden-real-time-data

Usage

```
transmission_FI_to_SE1_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_FI_to_SE1_RTD(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

transmission_FI_to_SE3_RTD
Transmission between Finland and Central Sweden - real time data

Description

Check https://data.fingrid.fi/en/dataset/transmission-between-finland-and-central-sweden-real-time-data

Usage

```
transmission_FI_to_SE3_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- transmission_FI_to_SE3_RTD(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

unused_bilateral_trade_capacity_RUS_to_FI
Unused bilateral trade capacity RUS-FI

Description

Check https://data.fingrid.fi/en/dataset/unused-bilateral-trade-capacity-rus-fi

Usage

```
unused_bilateral_trade_capacity_RUS_to_FI(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains unused bilateral trade capacity from Russia (RUS) to Finland (FI). The capacity of electricity transmission in bilateral trade can be left unused if the parties do not import the maximum amount of electricity to Finland.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- unused_bilateral_trade_capacity_RUS_to_FI(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`unused_biliteral_trade_capacity_FI_to_RUS` *Unused bilateral trade capacity FI-RUS*

Description

Check https://data.fingrid.fi/en/dataset/unused-bilateral-trade-capacity-fi-rus

Usage

```
unused_biliteral_trade_capacity_FI_to_RUS(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Unused bilateral trade capacity from Finland (FI) to Russia (RUS). The capacity of electricity transmission in bilateral trade can be left unused if the parties do not export the maximum amount of electricity to Russia.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- unused_biliteral_trade_capacity_FI_to_RUS(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`up_regulation_price_balancing_energy_market` *Up-regulating price in the Balancing energy market*

Description

Check https://data.fingrid.fi/en/dataset/up-regulating-price-in-the-balancing-energy-market

Usage

```
up_regulation_price_balancing_energy_market(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains up-regulating price in Finland, which 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, eg. information from hour 07-08 is published at 9 o'clock.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- up_regulation_price_balancing_energy_market(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`weekly_planned_capacity_P1_north_to_south` *Planned weekly capacity from north to south defined by Fingrid*

Description

Check https://data.fingrid.fi/en/dataset/planned-weekly-capacity-from-north-to-south-defined-by-fingrid

Usage

```
weekly_planned_capacity_P1_north_to_south(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- weekly_planned_capacity_P1_north_to_south(start_time = start,
                                                end_time = end,
                                                user_key = key)
summary(df)

## End(Not run)
```

`weekly_planned_capacity_P1_south_to_north` *Planned weekly capacity from south to north defined by Fingrid*

Description

Check https://data.fingrid.fi/en/dataset/planned-weekly-capacity-from-south-to-north-defined-by-fingrid

Usage

```
weekly_planned_capacity_P1_south_to_north(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- weekly_planned_capacity_P1_south_to_north(start_time = start,
                                                end_time = end,
                                                user_key = key)
summary(df)

## End(Not run)
```

wind_power_generation_forecast_daily_updated
Wind power generation forecast - updated once a day

Description

Check https://data.fingrid.fi/en/dataset/wind-power-generation-forecast-updated-once-a-day

Usage

```
wind_power_generation_forecast_daily_updated(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- wind_power_generation_forecast_daily_updated(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`wind_power_generation_forecast_hourly_updated` *Wind power generation forecast - updated hourly*

Description

Check https://data.fingrid.fi/en/dataset/wind-power-generation-forecast-updated-every-hour

Usage

```
wind_power_generation_forecast_hourly_updated(
  start_time = NA,
  end_time = NA,
  user_key = NA
)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains Finnish wind power generation forecast for the next 36 hours. Updated hourly. 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.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- wind_power_generation_forecast_hourly_updated(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

wind_power_hourly_data *Wind power generation - hourly data*

Description

Check https://data.fingrid.fi/en/dataset/wind-power-generation

Usage

```
wind_power_hourly_data(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

start_time	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
end_time	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
user_key	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains finnish hourly 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 a tenth of the production capacity.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- wind_power_hourly_data(start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

`wind_power_production_RTD` *Wind power production - real time data*

Description

Check https://data.fingrid.fi/en/dataset/wind-power-production-real-time-data

Usage

```
wind_power_production_RTD(start_time = NA, end_time = NA, user_key = NA)
```

Arguments

`start_time`	Start time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`end_time`	End time in UTC with offset. Character array in ISO8601, YYYY-MM-ddTHH:mm:ssZ
`user_key`	Character array holding API-key. Free from https://data.fingrid.fi/open-data-forms/registration/

Value

A data frame object that contains wind power production based on the real-time measurements in Fingrid's operation control system. About a tenth of the production capacity is estimated as measurements aren't available. The data is updated every 3 minutes.

Examples

```
## Not run:
library(finnishgrid)
start = "2021-01-01T00:00:00+0200"  # UTC+2 offset, Helsinki time
end = "2021-01-10T00:00:00+0200"    # UTC+2 offset, Helsinki time
key = "MY_SUPER_SECRET"
df <- wind_power_production_RTD(
    start_time = start,
    end_time = end,
    user_key = key)
summary(df)

## End(Not run)
```

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