Package 'standardlastprofile'

May 9, 2026

Title BDEW Standard Load Profiles for Electricity

Description Provides representative standard load profiles (SLPs) for electricity published by the German Association of Energy and Water Industries (BDEW Bundesverband der Energie- und Wasserwirtschaft e.V.) in a tidy format. Covers the 1999 profiles — households (H0), commerce (G0–G6), and agriculture (L0–L2) — and the updated 2025 profiles (H25, G25, L25, P25, S25), which additionally represent households with photovoltaic systems and battery storage. Also provides an interface for generating a standard load profile over a user-defined date range. The 1999 data and methodology are described in VDEW (1999), ``Repräsentative VDEW-Lastprofile'', <https://www.bdew.de/media/documents/1999_Repraesentative-VDEW-Lastprofile.pdf>. The generation algorithm is described in VDEW (2000), ``Anwendung der Repräsentativen VDEW-Lastprofile step-by-step'', <https://www.bdew.de/media/documents/2000131_Anwendung-repraesentativen_Lastprofile-Step-by-step.pdf>. The 2025 profiles are described in BDEW (2025), ``Standardlastprofile Strom'', <https://www.bdew.de/energie/standardlastprofile-strom/>.

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Contents

`slp` *Standard Load Profile Data for Electricity from BDEW*

Description

Data about representative, standard load profiles for electricity from the German Association of Energy and Water Industries (BDEW Bundesverband der Energie- und Wasserwirtschaft e.V.) in a tidy format.

Usage

```
slp
```

Format

A data.frame with 26,784 observations and 5 variables:

profile_id character, identifier for load profile, see 'Details'

period character, one of `'summer'`, `'winter'`, `'transition'` for 1999 profiles; one of `'january'` through `'december'` for 2025 profiles

day character, one of `'saturday'`, `'sunday'`, `'workday'`

timestamp character, format: %H:%M

watts numeric, electric power in watts, normalised to 1,000 kWh/a

Details

There are 96 x 1/4h measurements of electrical power for each combination of `profile_id`, `period` and `day`, which we refer to as the "standard load profile".

In total there are 16 `profile_id` across two generations of profiles:

1999 profiles (based on analysis of 1,209 load profiles of low-voltage electricity consumers in Germany):

- Households: `H0`
- Commercial: `G0`, `G1`, `G2`, `G3`, `G4`, `G5`, `G6`
- Agriculture: `L0`, `L1`, `L2`

2025 profiles (updated profiles published by BDEW in 2025):

- Households: `H25`
- Commercial: `G25`
- Agriculture: `L25`
- Combination profile PV: `P25`
- Combination profile storage and PV: `S25`

The 2025 profiles use calendar months rather than seasons for the `period` column (`'january'` through `'december'`).

Call `slp_info()` for more information and examples.

Period definitions (1999 profiles):

- `summer`: May 15 to September 14
- `winter`: November 1 to March 20
- `transition`: March 21 to May 14, and September 15 to October 31

Day definitions:

- `workday`: Monday to Friday
- `saturday`: Saturdays; Dec 24th and Dec 31st are also treated as Saturdays unless they fall on a Sunday
- `sunday`: Sundays and all public holidays

Units and normalisation:

The source Excel file for the 1999 profiles stores values in watts (W), normalised to an annual consumption of 1,000 kWh/a. The source Excel file for the 2025 profiles stores values in kilowatt-hours (kWh) per 15-minute interval, normalised to 1,000,000 kWh/a. To keep the internal representation consistent and backwards compatible, all 2025 values have been converted to watts normalised to 1,000 kWh/a.

As a result, the `watts` column in both this dataset and the output of `slp_generate()` always represents average electric power in watts, normalised to 1,000 kWh/a. To convert to energy consumed per 15-minute interval in kWh, divide by 4 and by 1,000:

```
watts_to_kwh <- \(x) x / 4 / 1000
```

Source

https://www.bdew.de/energie/standardlastprofile-strom/

https://www.bdew.de/media/documents/Profile.zip

https://www.bdew.de/media/documents/1999_Repraesentative-VDEW-Lastprofile.pdf

Examples

```
head(slp)
```

---

slp_generate *Generate a Standard Load Profile for Electricity*

Description

Generate a standard load profile in watts, normalised to an annual consumption of 1,000 kWh.

Usage

```
slp_generate(
  profile_id,
  start_date,
  end_date,
  holidays = NULL,
  state_code = deprecated()
)
```

Arguments

profile_id	load profile identifier, required
start_date	start date in ISO 8601 format, greater than or equal to "1990-01-01", required
end_date	end date in ISO 8601 format, no later than "2073-12-31", required
holidays	an optional character or Date vector of dates in ISO 8601 format ("YYYY-MM-DD") that are treated as public holidays (and therefore mapped to "sunday" in the algorithm). When supplied, the built-in holiday data are ignored entirely and only the dates in holidays are used.
state_code	**[Deprecated]** Use holidays instead.

Details

In the German electricity market, a standard load profile is a representative pattern of electricity consumption used to forecast demand for customer groups that are not continuously metered. For each distinct combination of profile_id, period, and day there are 96 quarter-hourly measurements of electrical power, normalised to an annual consumption of 1,000 kWh. This function supports data from 1990 to 2073.

See vignette("standardlastprofile") for more details about the algorithm.

Profile IDs:

There are 16 profile IDs across two generations:

1999 profiles:

- `H0`: Households
- `G0`, `G1`, `G2`, `G3`, `G4`, `G5`, `G6`: Commercial
- `L0`, `L1`, `L2`: Agriculture

2025 profiles

In 2025, BDEW published an updated set of standard load profiles reflecting changes in electricity consumption patterns since the original 1999 study. Five new profiles are included:

- `H25`: households — updated version of `H0`
- `G25`: commerce (general) — updated version of `G0`
- `L25`: agriculture — updated version of `L0`
- `P25`: combination profile for households with a photovoltaic (PV) system
- `S25`: combination profile for households with a PV system and battery storage

For descriptions of each profile, call `slp_info()`.

Periods and day types:

1999 profiles use three seasonal periods:

- `summer`: May 15 to September 14
- `winter`: November 1 to March 20
- `transition`: March 21 to May 14, and September 15 to October 31

2025 profiles use calendar months (`january` ... `december`) instead of seasons.

Within each period, days are classified as:

- `workday`: Monday to Friday
- `saturday`: Saturdays; Dec 24th and Dec 31st are also treated as Saturdays unless they fall on a Sunday
- `sunday`: Sundays and all public holidays

Public holidays:

By default, the following nine public holidays observed nationwide across all German states are treated as Sundays:

- New Year's Day (1 January)
- Good Friday
- Easter Monday
- Labour Day (1 May)
- Ascension Day
- Whit Monday
- German Unity Day (3 October)
- Christmas Day (25 December)
- Boxing Day (26 December)

State-level holidays are **not** included by default. These vary by state and can change — for example, Berlin observed a one-time holiday on 8 May 2025 (end of World War II anniversary). Use the `holidays` argument to supply your own dates instead; the built-in data are then ignored entirely.

Units and conversion:

The 1999 source file stores values in watts (W), normalised to 1,000 kWh/a. The 2025 source file stores values in kWh per 15-minute interval, normalised to 1,000,000 kWh/a. To keep all profiles consistent, the 2025 values are converted to watts normalised to 1,000 kWh/a.

To convert to energy consumed per interval in kWh:

```
kwh <- out$watts / 4 / 1000
```

Value

A data.frame with four variables:

- `profile_id`, character, load profile identifier
- `start_time`, POSIXct / POSIXlt, start time
- `end_time`, POSIXct / POSIXlt, end time
- `watts`, numeric, average electric power in watts per 15-minute interval, normalised to an annual consumption of 1,000 kWh

Source

https://www.bdew.de/energie/standardlastprofile-strom/

https://www.bdew.de/media/documents/1999_Repraesentative-VDEW-Lastprofile.pdf

https://www.bdew.de/media/documents/2000131_Anwendung-repraesentativen_Lastprofile-Step-by-step.pdf

Examples

```
start <- "2026-01-01"
end <- "2026-12-31"

# multiple profile IDs are supported
L <- slp_generate(c("L0", "L1", "L2"), start, end)
head(L)

# supply custom holiday dates (e.g. only treat New Year's Day as a holiday)
H0_custom <- slp_generate("H0", start, end, holidays = "2026-01-01")

# Fetch state-level holidays from the nager.Date API and pass them in.
# Each entry in the API response contains two relevant fields:
#   $global  — logical; TRUE = nationwide holiday, FALSE = state-specific
#   $counties — list of ISO 3166-2 state codes (e.g. "DE-BE" for Berlin)
#               when global is FALSE; NULL otherwise
#
# Berlin (DE-BE) observes International Women's Day (March 8) in addition
# to all nationwide holidays. The example below fetches 2027 holidays,
# keeps entries where global is TRUE or "DE-BE" appears in counties, and
# passes the resulting dates to slp_generate().
## Not run:
resp <- httr2::request("https://date.nager.at/api/v3") |>
  httr2::req_url_path_append("PublicHolidays", "2027", "DE") |>
```

```
  httr2::req_perform() |>
  httr2::resp_body_json()

is_berlin <- \(x) isTRUE(x$global) || "DE-BE" %in% unlist(x$counties)
holidays_berlin_2027 <- as.Date(
  vapply(Filter(is_berlin, resp), \(x) x$date, character(1))
)

H0_berlin_2027 <- slp_generate(
  "H0", "2027-01-01", "2027-12-31",
  holidays = holidays_berlin_2027
)

## End(Not run)

# consider only nationwide public holidays (default)
H0_2026 <- slp_generate("H0", start, end)

# when the deprecated state_code and holidays are both supplied, both sets
# of dates are treated as Sundays: user-provided dates from holidays and
# state-specific built-in holidays from state_code are merged
suppressWarnings(
  slp_generate("G0", "2026-04-01", "2026-04-01",
    state_code = "SL", holidays = "2026-04-01") |>
    head()
)

# electric power values are normalised to consumption of ~1,000 kWh/a
sum(H0_2026$watts / 4 / 1000)

# convert watts to kWh per interval using a wrapper
slp_generate_kwh <- \(...) {
  out <- slp_generate(...)
  out$kwh <- out$watts / 4 / 1000
  out
}
H0_kwh <- slp_generate_kwh("H0", start, end)
head(H0_kwh)
```

`slp_info` *Retrieve information on standard load profiles*

Description

Information and examples on standard load profiles from the German Association of Energy and Water Industries (BDEW Bundesverband der Energie- und Wasserwirtschaft e.V.)

Usage

```
slp_info(profile_id, language = c("EN", "DE"))
```

Arguments

profile_id	load profile identifier, required
language	one of "EN" (default) or "DE"

Value

A named list with one element per profile_id. Each element is itself a list with three character components: profile (the identifier), description (a short label), and details (a longer explanation).

Source

https://www.bdew.de/energie/standardlastprofile-strom/

https://www.bdew.de/media/documents/2000131_Anwendung-repraesentativen_Lastprofile-Step-by-step.pdf

https://www.bdew.de/media/documents/Zuordnung_der_VDEW-Lastprofile_zum_Kundengruppenschluessel.pdf

Examples

```
slp_info("G5", language = "DE")

# multiple profile IDs are supported
slp_info(c("G0", "G5"))
```

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