Elda: Guidelines

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:
- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

Contents

Introduction

Elda, which stands for 'Electricity Data Assistant,' provides key data on the European power sector from 2018 onwards. This data includes indicators related to electricity generation, CO2eq emissions, electricity demand, wholesale day-ahead electricity prices, cumulative installed capacity, and electricity cross-border flows. The data is available at hourly, daily, monthly, and yearly levels for all indicators, except for installed capacity, for which only annual-level data is available. Elda offers users data on all these indicators, encompassing information up until 11 pm yesterday. Specifically, regarding price data, it provides the most up-to-date information, including values for today up until 11 pm.

Elda's data primarily originates from the ENTSO-E transparency platform, supplemented by Eurostat's monthly and annual data. In the case of the UK and Switzerland, their national sources are utilized. Elda does not delve into the national sources of individual countries, which may result in minor discrepancies compared to the national dataset. While the ENTSO-E and Eurostat data also stem from national sources, the reasons for these slight misalignments remain unclear to us. Nonetheless, for certain countries, we have made corrections based on feedback received from our national associations to align more closely with national sources.

Elda's yearly data, up to 2021, is expected to be more accurate, as it is exclusively sourced from the Eurostat annual dataset (with the exception of prices, which consistently come from the ENTSO-E transparency platform). For further information on data sources, please consult the explanations provided for each indicator.

For Cyprus, Malta, Switzerland and Ireland, data at hourly and daily level are not available due to limitations with the data sources. Hence, for these countries, if a user navigates 'hourly' or 'daily' data for some indicators, Elda will show 'no data available for selection'. More details on the exceptions can be found under the explanation of each indicators.

Electricity Generation

Electricity generation provides data on the gross electricity generated in a country or region, including auxiliary consumption in power plants. This data is available both as a total, disaggregated figure and with a breakdown of the generation technologies contributing to it. With the exception of a few countries, this data is available at hourly, daily, monthly, and yearly intervals.

Time zone
All data reported at Central European Time (CET).

Units
Yearly – TWh
Monthly, Daily and Hourly - GWh

Scope
EU-27 + UK+ Switzerland + Norway

Methodology
This data is primarily sourced from Eurostat and the ENTSO-E transparency platform (ENTSO-E TP), with a few exceptions for certain countries. Hourly data is consistently obtained from the ENTSO-E transparency platform. Daily data is calculated by aggregating the hourly data, while monthly data is sourced from Eurostat's monthly data whenever possible. For the latest two or three months, Eurostat data is typically unavailable. In such cases, monthly data is calculated using the previous year's Eurostat data and the year-over-year difference between ENTSO-E data. This data will be updated when Eurostat makes its monthly data available. Yearly data is sourced from Eurostat's annual data whenever possible. However, there is usually a delay in the publication of annual data in Eurostat. Therefore, the current year and the previous year's data are not available in Eurostat. Consequently, this data is calculated by aggregating the monthly dataset. This data will be updated when Eurostat updates its data. Due to this methodology, the aggregated daily and monthly data may not match the monthly and yearly data.

Accuracy
The yearly data until the year before the previous year (until 2021 when we are in 2023) is the most accurate because it is sourced from the complete dataset of Eurostat, which also provides the gross electricity generated. As for the yearly data of the current year and the previous year, they are taken from Eurostat's monthly dataset or adjusted with ENTSO-E's data. Since these datasets provide net electricity generated (excluding auxiliary consumption), this data is not perfect. We derive the gross electricity generated from the net electricity generation by applying a certain percentage of auxiliary consumption for each technology. Regarding the hourly and daily data sourced from ENTSO-E's dataset, it may not be perfect as well. As ENTSO-E's data is known to have some gaps and issues, we always attempt to rectify this by making logical assumptions to ensure dataset completeness.

Exceptions
Malta - Malta's data is only available at a monthly and yearly granularity since hourly data is not available in the ENTSO-E transparency platform. Therefore, it is sourced exclusively from Eurostat. When Eurostat's data is unavailable for recent months, the previous year's Eurostat data is temporarily used and updated when Eurostat's data becomes available.

Cyprus - Hourly data for Cyprus is not available in the ENTSO-E TP from 2023 onwards. Hence, hourly and daily data from 2023 onwards is not accessible through Elda. A similar approach to the one mentioned above is followed.

Ireland - Hourly data for Ireland in the ENTSO-E TP contains many gaps and issues and is not reliable. Therefore, Elda currently does not provide Ireland's hourly and daily data. The monthly and yearly data is made available using Eurostat's data.

UK - UK's data is sourced from the Elexon data portal if the ENTSO-E TP data is not available (due to Brexit, data has been unavailable since 2020). The Elexon data portal data is incomplete because it only includes data from major producers. Therefore, the hourly, daily, and monthly data for the UK is not perfect. The yearly data for the UK is sourced from Ember's open data platform.

Switzerland - Switzerland's data in the ENTSO-E TP does not include conventional fossil fuel plants' data. Hence, Elda does not report hourly and daily data for Switzerland as it could mislead users. Only the monthly and yearly data is available through Elda, which is sourced from Swiss Federal Office for Energy and Ember's open data platform respectively.

CO$_2$eq emissions

CO2eq emissions represent the CO2 equivalent emissions resulting from electricity generation in a specific country or region. It does not account for the emissions of imported electricity. This data is available both as a total, disaggregated figure and with a breakdown of the generation technologies causing it. With the exception of a few countries, this data is available at hourly, daily, monthly, and yearly intervals.

Time zone
All data reported at Central European Time (CET).

Units
CO2eq emissions
Yearly – MtCO2eq
Monthly, Daily and Hourly - ktCO2eq

CO2eq emissions intensity
g-CO2e/kWh

Scope
EU-27 + UK+ Switzerland + Norway

Methodology
This is calculated based on the CO2 equivalent emission factor of each power-producing technology. To calculate the CO2 equivalent emissions from a country's electricity generation, the electricity generated from each technology (in kWh) is multiplied by the emission factor (in gCO2/kWh), taking into account the efficiency of the technology. To calculate CO2eq emissions intensity, the total emissions of a country or region are divided by the total electricity generated. Emissions from renewable and nuclear power plants are considered to be zero.

Accuracy
Ideally, the emission factor should have been considered based on individual power plants. Therefore, the estimated emissions may not be perfect. However, the CO2 emissions intensity we have estimated is approaching the CO2 emissions intensity reported by the European Environmental Agency. Additionally, the calculated emissions will depend on the accuracy of the calculated electricity generation. As yearly granularity of electricity generation is more accurate, the same applies to emissions.

Exceptions
Since emissions are calculated based on electricity generation, the exceptions related to electricity generation also apply to CO2eq emissions. For more details, please refer to the exceptions in the electricity generation section.

Electricity Demand

Electricity demand is calculated as the final consumption of electricity in a certain country or region. With the exception of a few countries, this data is available at hourly, daily, monthly, and yearly granularity.

Time zone
All data reported at Central European Time (CET).

Units
Yearly – TWh
Monthly, Daily and Hourly - GWh

Scope
EU-27 + UK+ Switzerland + Norway

Methodology
For hourly granularity, this is represented as the load taken from the load data available in the ENTSO-E TP. Daily data is an aggregation of the hourly dataset. However, for monthly and yearly granularity, electricity demand is calculated as the sum of electricity generated and net imports.

Accuracy
As this is calculated from the electricity generation and net imports, the accuracy will depend on those datasets. Please refer to the accuracy of the electricity generation and net imports.

Exceptions
Malta - Malta's electricity demand is only available at a monthly and yearly granularity since the electricity generation data is also only available at a monthly and yearly granularity. This limitation exists because the hourly data of electricity generation and electricity load is not available in the ENTSO-E transparency platform.

Cyprus - Since Cyprus is isolated from the rest of the countries, there is no net import of electricity for Cyprus. Therefore, for Cyprus, the demand is considered to be equal to the electricity generated. Since ENTSO-TP doesn't have the hourly electricity data for Cyprus, only monthly and yearly electricity data are available.
Ireland - Hourly data for Ireland in the ENTSO-E TP has many gaps and issues and is not reliable. Therefore, Elda currently does not provide Ireland's hourly and daily data. The monthly and yearly data are made available using Eurostat's data.

Electricity Price

The Electricity Price reported by Elda represents the wholesale day-ahead electricity market price for each bidding zone. Please note that this is not the retail price which are paid by the consumers. If a country has multiple bidding zones, only bidding zone prices are reported; a country average or proxy is not provided. Therefore, for Italy, Sweden, Denmark, and Norway, where there are multiple bidding zones, users must select the corresponding bidding zone to view the price. In the future version, we will include simple average prices for these countries with multiple bidding zones.

Time zone
All data reported at Central European Time (CET).

Units
Euro/MWh

Scope
EU (no cyprus & Malta) + UK+ Switzerland + Norway

Methodology
Except for the UK, this data is sourced exclusively from ENTSO-E TP. For the UK, the data is obtained from the Elexon data portal. Unlike other indicators, the data for daily, monthly, and yearly values represents averages and not sums. The EU average is a simple average (without considering electricity traded) of the day-ahead electricity prices in the bidding zones. A comparison of the EU minimum, maximum, and average can be made using Elda. The EU minimum and maximum represent the averages of the minimum and maximum hourly prices in the EU's bidding zones.

Accuracy
As this data is sourced from ENTSO-TP, and this particular dataset is known to be of good quality, Elda's electricity price data is also of good quality. However, ENTSO-TP occasionally has some gaps for certain hours in its dataset. Elda reports these prices as they are and does not fill the gaps in the ENTSO-E TP dataset. Therefore, if the price for a specific hour is missing in ENTSO-TP, this data will also be unavailable in Elda. When calculating averages for daily, monthly, and yearly granularity, this missing data will not be included. However, the number of gaps in ENTSO-E TP is known to be very low, and the dataset's accuracy will not be seriously affected.

Exceptions
Ireland - The price data reported in ENTSO-TP for Ireland is known to have issues with a large number of gaps. Therefore, users might encounter 'no data available for selection' for many hours in Ireland. It is known that the quality of this dataset will be improved in the ENTSO-E TP in the future.

Cyprus and Malta - Since there is no liquid wholesale electricity market in these countries and no prices are reported in ENTSO-TP, Elda does not display the electricity prices in these countries.
UK - The prices reported are based on the data received from APX in the Elexon data portal.

Germany/Austria/Luxembourg - Until October 2018, Germany, Austria, and Luxembourg had a single bidding zone, and then Austria was split from this bidding zone. Therefore, hourly data for January to September 2018 can only be found under Germany/Austria/Luxembourg.

Italy - Since Italy has multiple bidding zones, users should refer to the bidding zones North Italy, South Italy, Sicily, Sardinia, Centre-North Italy, and Centre-South Italy for prices in Italy.

Denmark - Since the country has two bidding zones, users should refer to Denmark_1 and Denmark_2 for prices.

Sweden - Since the country has four bidding zones, users should refer to Sweden_1, Sweden_2, Sweden_3, and Sweden_4 for prices.

Norway - Since the country has multiple bidding zones, users should refer to Norway_1, Norway_2, Norway_3, Norway_4, and Norway_5 for prices.

Capacity

Capacity reported by Elda is the cumulative installed electricity production capacity of a country/region. This data is only reported at yearly granularity.

Units
MW

Scope
EU-27 + UK + Switzerland + Norway

Methodology
The capacity data is sourced from Eurostat and ENTSO-E TP. Since the fossil fuel and biofuels capacity data are not disaggregated in Eurostat, it is always sourced from ENTSO-TP. As ENTSO-E TP does not report self-production capacity and small power plants' capacity, for renewable capacities, Eurostat's data is used whenever available. However, since there is a delay in Eurostat's reporting, the capacity for the current year and the previous year (2023 and 2022 when we are in 2023) is not available in Eurostat. For these years, the capacity is estimated using historic Eurostat data and the year-over-year difference in ENTSO-E TP data.

For EU installed capacity, the member states' capacity data is aggregated, and this is further curated based on other sources such as technology associations (Wind Europe for Wind and Solar Power Europe for solar). Therefore, the aggregated value of all member states' capacity might not match the EU capacity reported by Elda.

Accuracy
The historic data (from the year before the previous year) will be more accurate since the renewables capacity is sourced from Eurostat. The data for the current year and the previous year might not be perfect as it is estimated based on Eurostat and ENTSO-E datasets.

Exceptions
Cyprus and Malta - The data of these countries are not reported in the ENTSO-E TP. Hence, the data for these countries are collected from their national sources and Eurostat (for historic years).

Switzerland - The data of Switzerland reported in the ENTSO-E TP is incomplete. Hence, the data for Switzerland is collected from Swiss Federal of Energy and IRENA's renewable energy capacity statistics.

UK - The capacity data of the UK is from DUKES (Digest of UK Energy Statistics).

Cross-Border-Flows

Cross-border flows data shown by Elda pertains to the electricity flowing across the borders of the EU, as well as the electricity flowing to and from EU countries. Elda provides information on the net cross-border flows between two countries, which represents the net export data between them. Additionally, Elda reports the total net cross-border flow of a country, representing its net export data with its neighbors. Elda also provides data on the net cross-border flow of the EU and its neighboring countries. The net cross-border flow is reported as net export, where a positive value indicates export, and a negative value indicates import.

Units
Yearly – GWh
Monthly, Daily and Hourly – MWh

Scope
EU-27 + UK + Switzerland + Norway

Methodology
The hourly cross-border data is sourced from ENTSO-E TP, and daily values are the aggregated sum of the hourly data. However, the monthly data for EU member states is sourced from Eurostat's monthly data, and the yearly values are the aggregated sum of the monthly data. When the data is unavailable in Eurostat, ENTSO-TP data is used and updated when Eurostat's data becomes available. The net-cross-border data for the EU is calculated from the member states' data.

Accuracy
The accuracy of this data depends on ENTSO-E TP and Eurostat data. Elda does not make any additional corrections to this dataset.

Exceptions
Cyprus – Cyprus currently has no operating interconnection with European countries, so there is no data to report

Dowloading Data

Elda allows a user to download the chart and the data associated with it and also the bulk data of a user's choice. A chart can be downloaded as a png file and the data associated with it as csv file. The option to download this can be found on the top right corner of every chart. Depending on the chart types, a user may find option to modify the date range of the chart. By default, the data shown will be for the current/previous day, month and year depending on the granularity you choose.

Downloading data in bulk can be done by clicking that can be found on the bottom right of the webpage. Following data are available for download:
- Cross-border-flows (MWh): This is about the electricity flowing from one country to all its neighbours. User can choose a country (zone) with the periodicity and date range to download the data. The downloaded dataset will have the data of the power flow from the selected country to each of its neighbours.

- Net-cross-border-flows (MWh): This provides the net value of electricity flowing between the selected country and all its neighbours . A positive value indicates the selected country is a net exporter to the mentioned neighbour, while a negative value indicates the selected country is a net importer from the mentioned neighbour.

- Total-cross-border-flows (MWh): This provides data on the electricity flowing out of a country by aggregating the flows with all its neighbors. Here the flow between each neighbour will not be shown.

- Total-net-cross-border-flows (MWh): This provides the net value of total cross-border flow data, which represents the sum of the power flow out of and into the country.

- Generation-per-type (TWh): The generation data of a country disaggregated with the fuels contributing to the electricity generation along with the total value.

- Generation-share: The data of share of each technology contributing to the electricity generation.

- CO2-emissions (kgCO_2eq): The CO2 equivalent emissions from the power generation of a country with split of contributing technologies.

- CO2-intensity (g-CO_2eq/kWh) The CO2 equivalent emissions intensity of the power sector of the selected country for the selected period and time.

- Installed-capacity (MW): The cumulative installed power production capacity for the selected year for the selected country.

- Load: The final electricity consumption (MWh) data of the selected country for the selected period.

- Price (Euro/MWh): The wholesale day-ahead electricity prices of the selected bidding zone. If the user chooses daily, monthly or yearly, please note that these are average values calculated from the hourly prices.

Contact Us

As you read the methodology, we have made every effort to report the present data with the best possible quality. However, there are limitations with sources for some countries. Moreover, as the data on this platform is updated and calculated automatically by fetching data from source APIs, we have limitations in curating the data for every country using national sources. Nevertheless, if you identify major errors in the dataset for a certain country, please report them to us, and we will be happy to correct them. Also, please use your laptops or desktop computers to get the best performance of Elda. Additionally, if you have any questions or suggestions for improving Elda, please contact aolikathodi@eurelectric.org.

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development
- Growth, added-value, efficiency

Environmental Leadership
- Commitment, innovation, pro-activeness

Social Responsibility
- Transparency, ethics, accountability