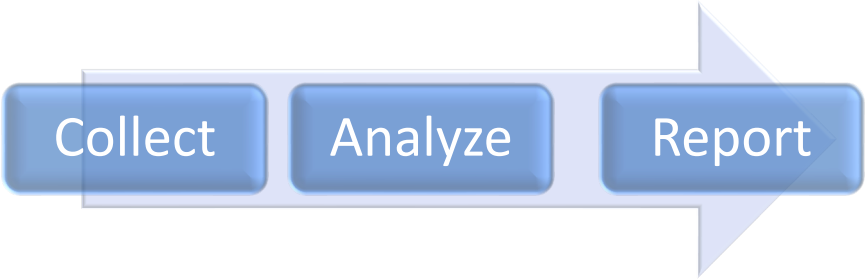
energy prices



Energy Prices Calculation Methodology: Natural Gas and Electricity for the EU and UK

Introduction:

Energy prices play a crucial role in both daily life and broader economic activities. Accurate end-user prices for natural gas and electricity directly impact consumer spending, inflation, and business operations. This document outlines the methodology employed by Energy Prices to calculate reliable average energy prices across the European Union (EU) and the United Kingdom (UK).

The methodology combines data from various sources, including individual respondents, national regulatory authorities, and local news reports, ensuring that the calculations reflect current, real-world pricing conditions. By validating these inputs with data from European energy utilities, we create a robust framework that accurately reflects energy prices across the region.

Data sources:

Our methodology draws from three key data sources:

Respondents:

Individuals and commercial entities provide data on the prices they pay for energy (per kilowatt-hour or cubic meter). These respondents report prices based on their current contractual agreements, and in some cases, receive compensation for their participation.

Energy regulators:

We maintain a collaboration with national regulatory authorities across the EU and UK. Regulators provide updates on energy tariffs, helping us to maintain data integrity.

News articles:

Local news outlets often report on changes in energy prices. Investigative journalism may uncover new pricing details affecting households and commercial entities, making this a valuable source of information.

Data pre-processing:

Once data is collected, it undergoes several stages of processing to ensure accuracy and consistency:

Data cleaning:

We check the consistency of data by comparing current inputs from respondents with their previous submissions. Incomplete data is removed, and extreme outliers are flagged for review. All data is anonymized before further processing.

Data standardization:

To ensure uniformity, we standardize all data into common units. For example, cubic meters of natural gas are converted to kilowatt-hours, and prices reported in currencies other than euros are converted based on the current exchange rate at the time of reporting. All prices are reported in euro/kWh.

Normalization:

Energy consumption patterns differ between consumers, so we categorize respondents into four distinct consumption groups (see Appendix 1). This normalization process ensures that the data is comparable across similar consumption levels.

Data analysis:

We calculate average energy prices using a weighted average method. This ensures that the prices we report are representative of different consumption categories.

General notes:

- EU Average Gross Calorific Value for natural gas is set at 38.48 (MJ/m3) is recognized.
- There is insufficient data to report on the natural gas markets for **Cyprus** and Malta in all categories. For **Finland** there is insufficient data to report on the natural gas prices for households.

Weighted Averages:

Each respondent's data is weighted based on the size of their consumption, their location, and the type of energy contract they hold (fixed or variable).

Consumption Patterns:

We apply a bandwidth to energy consumption to categorize respondents into households, office buildings, manufacturing plants, and industrial plants. These categories help ensure that price calculations reflect real-world consumption levels.

Contract Models:

We distinguish between fixed-price contracts and variable-price contracts when calculating average prices. The prevalence of these contracts in each country influences the weight given to the respondent's input.

Data Consistency and Validation:

To maintain data accuracy, we perform several consistency checks:

1. **Cross-verification:**
   We compare data from respondents, energy regulators, and news reports. Significant deviations between sources are flagged for further investigation.
2. **Historical comparison:**
   We analyse current data in the context of historical trends to detect anomalies or unusual pricing patterns.
3. **Validation with Energy Utilities:**
   Cross-checking results with data from energy utilities. If discrepancies are found, we prioritize the findings from Energy Prices' methodology after careful investigation.

Price Components:

End-user energy prices consist of multiple components. These vary between households and commercial entities:

Households:

a. Natural gas or electricity market price
b. Main transportation costs (natural gas) or transmission costs (electricity)
   Local distribution to households
c. Local distribution costs
d. Administrative costs (e.g. standing charges, metering fees)
e. Applicable taxes (excise duties, VAT, green taxes)

Commercial Entities:

a. Natural gas or electricity market price
b. Main transportation costs (natural gas) or transmission costs (electricity)
c. Local distribution (when applicable)
d. Administrative costs
e. Applicable taxes and duties (recoverable taxes like VAT are **not** included in the final price)

Presentation:

Energy Prices publishes the final energy cost data for end-users across the EU and UK, broken down by country and consumption category, and month of the year. For example, the average price an office building had to pay for electricity in Croatia, in February 2022, was 0.1290 euro/kWh.

Energy price data is typically published within the first 10 working days of the following month. For example, data for September is published in mid-October. The results are made available primarily in Microsoft Excel format for easy accessibility and analysis.

Appendices:

1. Consumption categories
2. Respondent Distribution by Country

Appendix 1: Consumption Categories

We apply the following annual consumption levels to categorize respondents:
The bandwidth applied to annual consumption overall is 20%, unless otherwise specified in the data publication.

1. Households

Commodity	Annual consumption
Electricity	3,500 kWh
Natural gas	15,000 kWh

2. Commercial - Office building

Commodity	Annual consumption
Electricity	100 MWh
Natural gas	500 MWh

3. Commercial – Manufacturing plant

Commodity	Annual consumption
Electricity	2 GWh
Natural gas	10 GWh

4. Commercial – Industrial plant

Commodity	Annual consumption
Electricity	100 GWh
Natural gas	500 GWh

Appendix 2: Respondent Distribution by Country

The table below shows the number of respondents contributing data, categorized by households and commercial entities:

Country	Households	Commercial entities
Austria	94	12
Belgium	181	18
Bulgaria	88	7
Croatia	47	5
Cyprus	56	5
Czech Republic	55	8
Denmark	106	10
Estonia	25	12
Finland	77	15
France	86	19
Germany	72	21
Greece	87	12
Hungary	19	8
Ireland	54	12
Italy	68	14
Latvia	12	4
Lithuania	18	6
Luxembourg	60	9
Malta	25	4
Netherlands	135	23
Poland	52	16
Portugal	56	11
Romania	32	7
Slovakia	19	7
Slovenia	34	8
Spain	89	16
Sweden	77	15
United Kingdom	78	15