



A WARM THANK YOU

TO THE ENERGY MARKET AUTHORITIES,
REGULATORS, ENERGY SUPPLIERS AND
RETAILERS, AND DISTRIBUTORS FOR THEIR
TIME AND COOPERATION TO ENSURE THE
QUALITY OF OUR RESEARCH AND DATA
THROUGHOUT THE PAST YEAR

WISHING YOU HAPPY HOLIDAYS
AND A PROSPEROUS 2022

THE HEPI PROJECT TEAM





E-CONTROL



Household Energy Price Index for Europe

DECEMBER 23, 2021

December Prices Just Released

The most up-to-date picture of European household electricity and gas prices: VaasaETT and two leading European energy market authorities collaborate to track monthly energy prices in 33 European countries.

Energie-Control Austria, the Hungarian Energy and Public Utility Regulatory Authority (MEKH) and VaasaETT are delighted to publish the results of our study of residential electricity and gas prices covering 33 European countries. Our price survey now includes every EU Member State in addition to members of the European Energy Community, Great Britain, Norway and Switzerland.

We would like to use this opportunity to thank the energy market authorities, energy suppliers and distributors for their time and cooperation to ensure the quality of our data.

If you would like to know more about the latest developments in residential energy prices, visit our project webpage at www.energypriceindex.com and subscribe to the free monthly update of the HEPI index for Europe.

IN THIS MONTH'S EDITION

Electricity price increases in Amsterdam, Athens, Brussels, Bucharest, Copenhagen, Dublin, Helsinki, Luxembourg City, Madrid, Nicosia, Oslo, Stockholm, Tallinn, Vienna and Warsaw

Electricity price decreases in Berlin, London, Paris, Prague and Riga

Natural gas price increases in Amsterdam, Athens, Copenhagen, London, Luxembourg City, Paris, Prague, Riga, Rome, Sofia and Vienna

Natural gas price decreases in Berlin, Bern and Brussels

Story of the month

["France shuts down nuclear reactors amid the deepening energy crisis"](#)

European Energy Price Development

Figure 1 shows the evolution of residential energy and distribution prices excluding taxes between January 2009 and December 2021 in 15 European capital cities. The index is calculated by weighing prices in each of the capital cities by the respective national electricity or gas residential consumption.

Residential electricity prices steadily decreased over the first half of 2009 and reached a trough at 96 index points in June 2009 as the economic crisis took its toll on demand and wholesale prices plummeted. Prices started to recover in the second half of 2009 together with (temporary) green shoots in economic activity and a general feeling that the worst of the crisis was behind us. They have been on an upward trend since then. The index for electricity reached as high as 116 index points in October 2014. Since then, it faltered and remained around 108 index points in 2016 and 2017. During 2019, the index was fluctuating around 115 and 119 points. However, the recent developments on the wholesale markets due to COVID-19 restrictions dropped the index rate down to 112 points in 2020. During 2021, the index has shown an increasing trend and it currently stands at the record-high level of 171 points.

The economic downturn which impacted energy demand and wholesale prices in 2009 is much more visible in the development of residential gas prices. The gas price index dropped significantly in 2009 and reached its lowest value only in February 2010 at 81 index points (nine months after the lowest value in the electricity price index). Retail prices started to recover in the winter of 2010 when a cold wave hit many parts of Europe. The index steadily increased until the beginning of 2013. It remained between 105 and 110 index points ever since despite a significant drop in natural gas prices on international markets during the year 2015. In 2016 however, gas prices plummeted reaching a 6-year low in September 2016 at 92 points. After a small hike up to 95 points in March 2017, a bigger one followed to 102 points in November 2018. Following the decreasing trend of the past two years, the gas price index is constantly increasing, surpassing November 2018 levels and reaching 165 index points in December 2021.

When examining the averages of the end-user prices for both electricity and gas, the following changes can be observed; from a year ago, December 2020, the electricity bills in all EU capitals have increased by 31% while the gas bills have increased by 52%.

Figure 1 Evolution of residential energy and distribution prices excluding taxes in the EUR-15

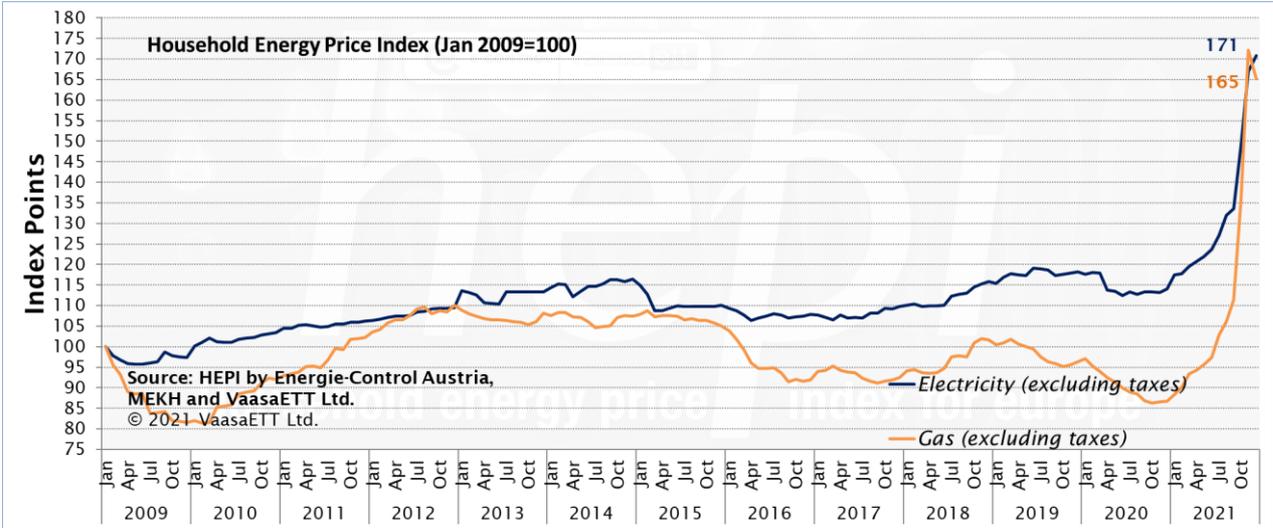
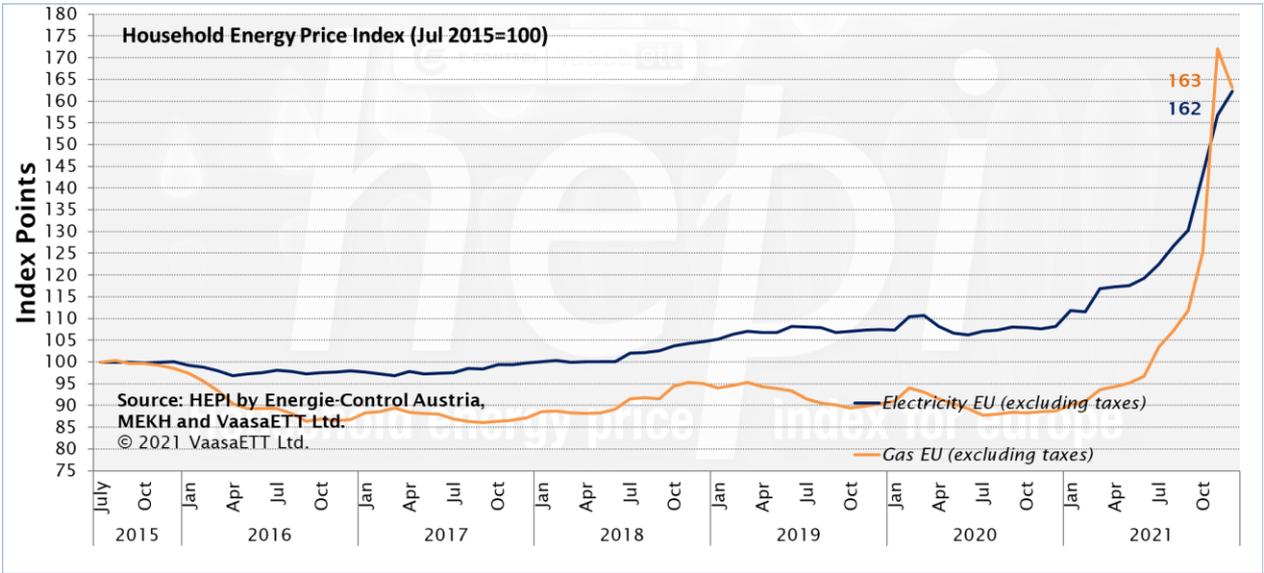


Figure 2 Evolution of residential energy and distribution prices excluding taxes in the EU¹



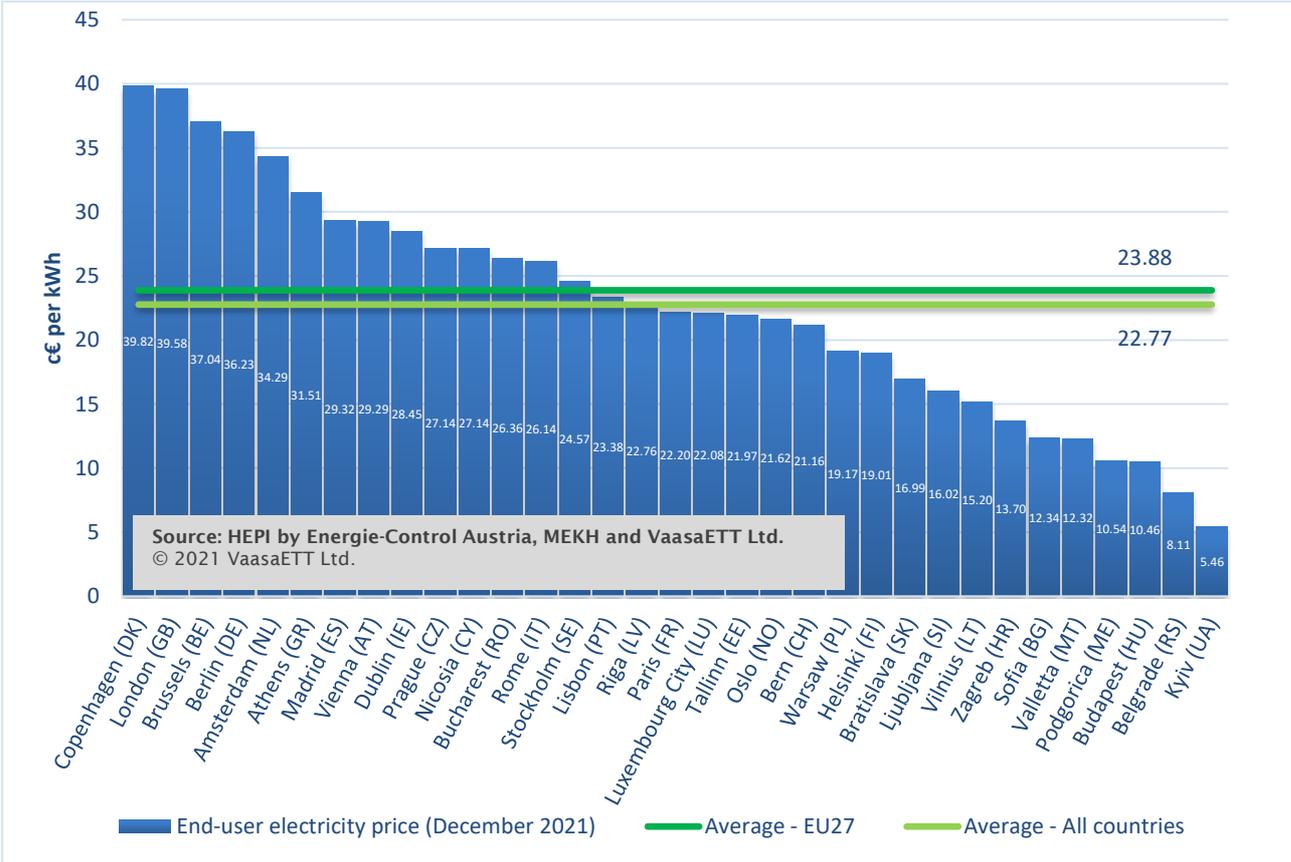
¹ EU-28 values were used between July 2015 - January 2020. EU-27 values are used from February 2020 onwards.

Residential Electricity Prices

Figure 3 shows the end-user price of electricity in the 33 European capital cities as of December 1st, 2021. It shows that depending on where a customer lives in Europe, the price that a customer pays can vary by a ratio of 5. If we include Kyiv, the price varies by a ratio of 7.3. Copenhagen and London are by far the most expensive cities for household customers in Europe, followed by Brussels, Berlin and Amsterdam.

Inhabitants of Kyiv pay the least expensive followed by inhabitants of Belgrade, Budapest and Podgorica. In nominal terms, prices in the capital cities of Central and Eastern Europe (CEE) tend to be lower than average; Prague and Bucharest are the only capital cities among the CEE countries in which the price of electricity is above the European average.

Figure 3 Residential electricity prices including taxes



The most significant changes that took place in the electricity market this month were as follows¹:

- A 22% price increase in Athens, due to increases in the energy component and the energy taxes;
- A 17% price increase in Stockholm, due to an increase in the energy component;
- A 12% price increase in Warsaw, due to an increase in the energy component;
- An 11% price increase in Amsterdam, due to an increase in the energy component;
- An 8% price increase in Nicosia, due to an increase in the energy component;
- A 7% price increase in Madrid, due to increases in the energy component and the energy taxes;
- A 6% price increase in Helsinki, due to an increase in the energy;
- A 5% price increase in Brussels, due to an increase in the energy component;
- A 4% price increase in Copenhagen and Oslo, due to increases in their energy components;
- A 4% price increase in Vienna, due to increases in the energy component and the energy taxes;
- A 3% price increase in Bucharest, Luxembourg City and Tallinn, due to increases in their energy components;
- A 2% price increase in Dublin;
- A 3% price decrease in Berlin;
- A 2% price decrease in London;
- A 2% price decrease in Riga, due to a decrease in the energy component;
- A 1% price decrease in Paris;
- A 1% price decrease in Prague, due to a decrease in the energy component.

In general, the upward trend in European energy prices continued this month, resulting in substantial increases, while about 2/3 of the capital cities studied are standing once again at record high prices. Specifically, those would be Amsterdam, Athens, Belgrade, Bern, Brussels, Bucharest, Copenhagen, Dublin, Helsinki, Kyiv, Luxembourg City, Madrid, Nicosia, Oslo, Rome, Sofia, Stockholm, Tallinn, Valletta, Vienna, Vilnius and Warsaw. The continuous upward trend is attributed to the economic recovery after the resumption of the world activity and the extraordinary weather conditions which led to higher demand, the raw material appreciation (record high natural gas price), which combined with empty gas storages put more pressure on the natural gas price and finally, the record high CO2 emissions allowances.

¹ The change in each capital city is calculated using the prices in their local currency to exclude the impact of exchange rate fluctuations.

In Stockholm, electricity retail price for a typical household has risen by 17% from previous month and by 42% compared to the price of December 2020². Overall, electricity prices in southern Sweden have often been higher than in the northern part. Even though electricity production capacity in southern Sweden is limited, high demand could be met by the production in the northern part of the country. Nevertheless, this is not possible due to the lack of transmission capacity from northern to southern Sweden, resulting in price differences between the North and South³.

Warsaw was one of the few electricity markets that, until recently, had not been affected significantly by the general upward trend. In December, however, the Energy Regulatory Office (ERO) approved price hikes⁴ for both the electricity and natural gas markets. Further increases will enter into force in January 2022, resulting in changes of about 24% and 54% in electricity and gas bills, respectively.

In Amsterdam, both electricity and natural gas retail prices have reached all-time-high levels, reflecting the upward trend of wholesale energy prices. Following the recent market developments, six Dutch suppliers so far have filed for bankruptcy due to surging gas prices⁵.

In many countries, support measures have been announced to mitigate the effect of the increased prices to end-customers. In Spain excise tax and VAT cut measures are already in force and are about to expire on 1 January 2022; the government is considering the extension of the support measures, or even reducing these taxes further to partially halt price rises⁶. The Polish government has announced excise duty and VAT reductions starting from January 2022, as well as a compensation scheme for electricity⁷. In Netherlands, the Dutch Government will lower the energy tax in 2022⁸. At the same time, the new energy taxes announced for 2022 aim to encourage customers to shift from natural gas to electric heating options⁹. In Norway, a compensation scheme has been announced by the government, which intends to cover half of the electricity costs, for the period December 2021 to March 2022, for wholesale prices above 70 ore/kWh¹⁰.

² Nordpool: "[Day-ahead prices](#)", 23.12.2021

³ EI: "[Elpriset 2021 – faktorer som påverkar](#)", 08.12.2021

⁴ Money: "[Gigantyczne podwyżki cen prądu i gazu stają się faktem. URE zatwierdził taryfy](#)", 17.12.2021

⁵ Reuters: "[Small Dutch energy provider collapses amid high gas prices](#)", 17.12.2021

⁶ El Pais: "[El Gobierno prepara más rebajas fiscales tras otro récord en el precio de la luz](#)", 14.12.2021

⁷ Rachuneco: "[Czas przygotować się na wzrost cen prądu w 2022 roku](#)", 21.12.2021

⁸ Milieu Centraal: "[Energiebelasting 2022](#)", 12.2021

⁹ Rijksoverheid: "[Milieubelastingen](#)", 12.2021

¹⁰ Bloomberg: "[Norway to Subsidize Households for Rising Electricity Costs](#)", 11.12.2021

France shuts down nuclear reactors amid the deepening energy crisis

France's main power generator, EDF (Électricité de France), was forced to extend the outage of two nuclear reactors of its power plants and shut down two more due to maintenance and safety reasons. Traditionally, France exports electricity in Europe, however the unexpected halt has already led to a significant increase in imports to cover the internal demand.

As a result of the shutdown, along with other factors such as the low gas reserves in Europe and the low temperatures causing increased demand, the wholesale market prices jumped once more to new record highs not only in France, but also affecting prices in interconnected countries. This extraordinary occurrence is expected to put even more pressure on top of an already unstable European energy market, affecting prices in 2022 for as long as the outages are going to last.

The reactors account for almost 10% of the country's nuclear capacity and the stoppages will result in a loss of about 1 TWh by the end of 2021. To avoid potential blackouts, the government is asking EDF to speed up the reopening of some reactors and is also reimbursing companies for cutting consumption during peak demand hours.

The crisis comes at a time when France has put pressure to the EU to recognise nuclear power as a sustainable, low-carbon energy source that could eventually make Europe independent and less volatile to the fluctuating prices.

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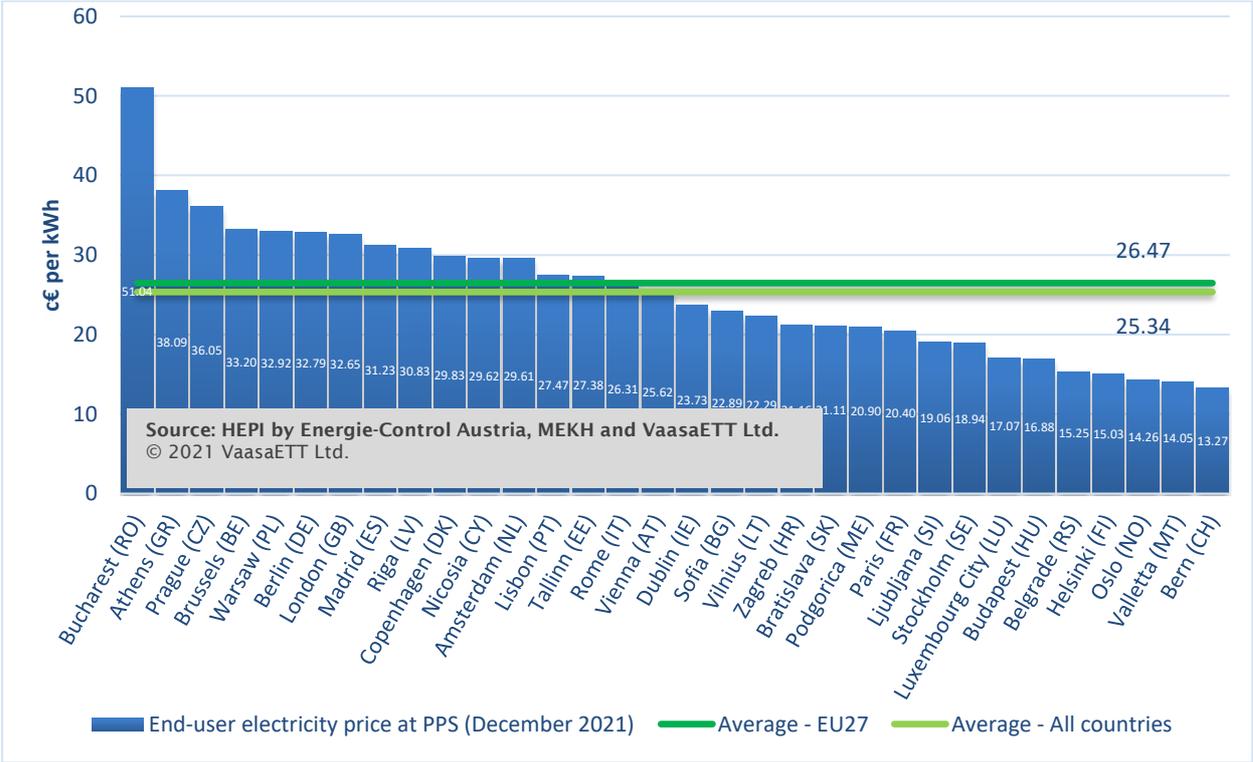
Sources:

[1] REUTERS: "[France's EDF takes more nuclear reactors offline after faults found](#)", 17.12.2021

[2] BusinessDay: "[Nuclear outages could see Europe face energy crunch](#)", 16.12.2021

When adjusted to purchasing power standards (PPS) in each country, the picture changes dramatically. PPS is an artificial common reference currency that eliminates general price level differences between countries. When expressed in PPS, energy prices are thus shown in relation to the cost of other goods and services. The lowest adjusted household electricity prices are found in Bern, Valletta, Oslo and Helsinki, while the highest are currently in Bucharest, Athens, Prague and Brussels. Half of CEE countries end up with electricity prices which are relatively high compared to the general level of prices in the country and above the European average (Figure 4).

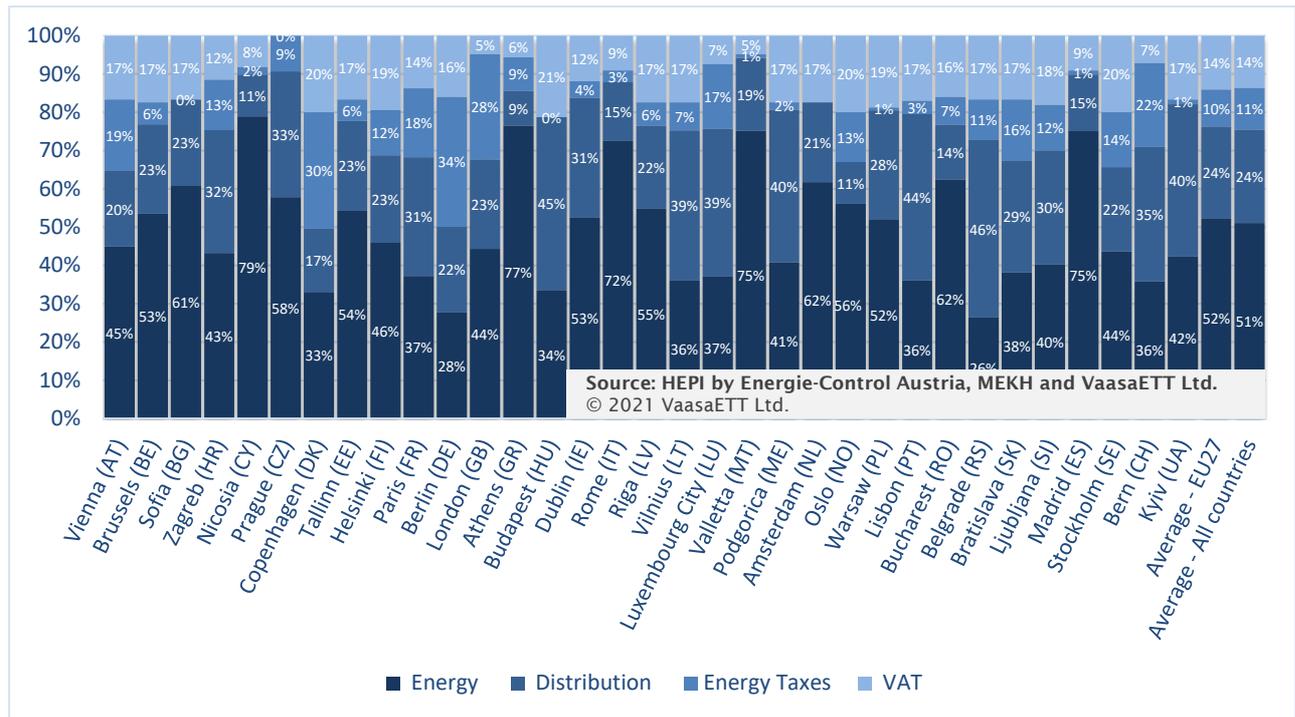
Figure 4 Residential electricity prices including taxes at PPS



Copenhagen is a very unusual case; the cost of energy as a commodity represents just 33% of the end-user electricity price, the third lowest of all surveyed cities, whereas the energy taxes represent an astonishing 30% (about three times Europe’s average) and 50% if we include VAT. A similar case is Berlin where since the introduction of the *Energiewende*, the energy tax component represents 34% of the end-user price of electricity, while the cost of energy as a commodity represents just 28% of the end-user electricity price, which is the lowest among all surveyed cities.

Additionally, starting from January 2020, a typical consumer in Amsterdam pays zero energy tax due to the increased amount of tax credit, which exceeds the indicated energy tax amount. On the contrary, they receive a refund on the exceeding tax credit amount. The aim of this refund is to encourage consumers towards electrification and switching away from gas heating and appliances.

Figure 5 Residential electricity price breakdown¹¹



Residential Gas Prices

Figure 6 shows the price of natural gas paid typically by residential customers in 28 European capital cities as of December 1st, 2021¹². The highest price by very far is paid by inhabitants of Stockholm who pay over twice the European average end-user price and about 1.2 times as much as the inhabitants of the second most expensive city, Copenhagen. This can be explained by the nature of the Swedish gas market; the small size of only 95,000 household gas customers in the whole of Sweden of which 61,000 in the isolated gas network in Stockholm¹³. Amsterdam is currently the third most expensive capital, while Bern stands at the fourth place of the most expensive capitals.

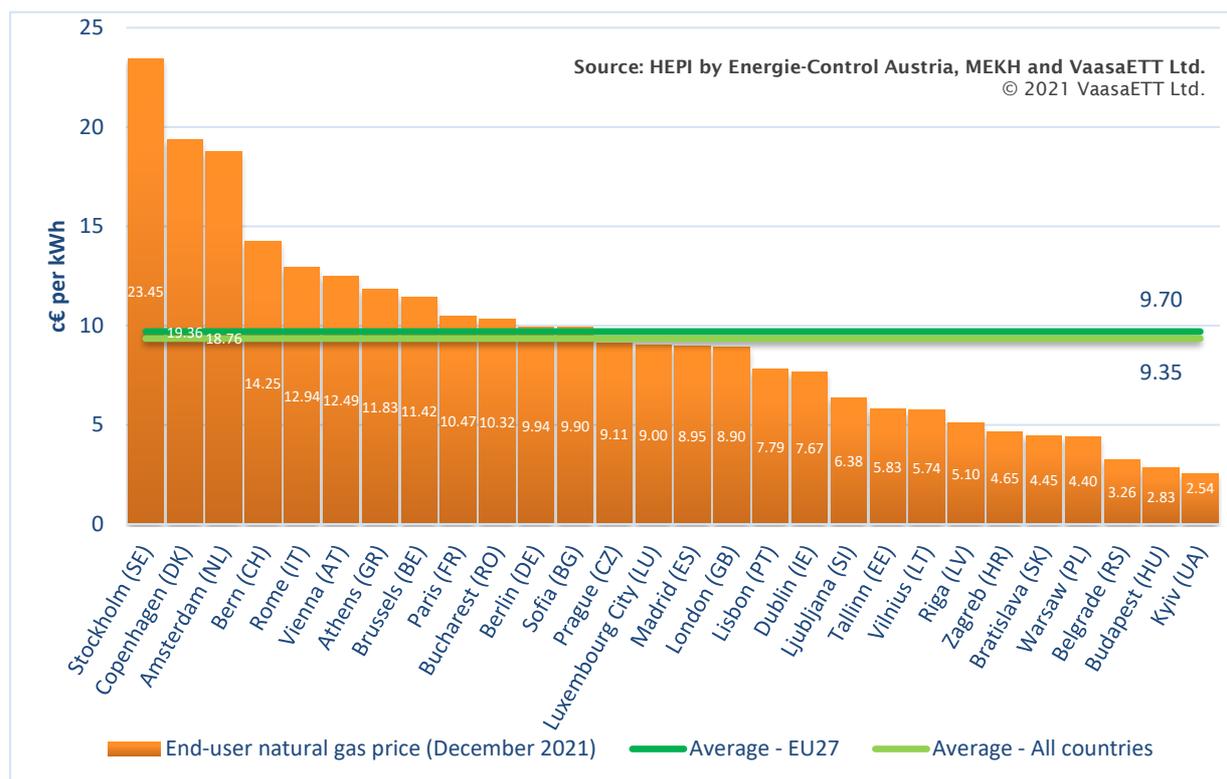
The prices in Stockholm are over 8 times as high as in Budapest, which is the cheapest city for gas in EU, and over 9 times as high if we include Kyiv. Even more pronounced than for electricity, household natural gas is cheapest in the CEE countries.

¹¹ Please note that proportions appearing in the graph are rounded, and due to this may not add up to 100%. Additionally, please note that for Amsterdam, NL, the typical household considered in HEPI research receives a tax refund on their energy tax. When considering this, the end-consumer's bill breakdown is as follows: Energy component 72%, distribution 24%, energy taxes -13%, and VAT 17%.

¹² Please note that Helsinki, Nicosia, Oslo, Podgorica and Valletta have been left out of this analysis on gas prices as there is virtually no residential gas market in these cities.

¹³ The Swedish electricity and natural gas market 2019 Ei (Ei R2020:07).

Figure 6 Residential gas prices including taxes



The most significant changes that took place in the natural gas market this month were as follows ¹⁴:

- A 16% price increase in Athens, due to increases in the energy and distribution components;
- A 15% price increase in Luxembourg City, due to an increase in the energy component;
- A 6% price increase in Sofia, due to an increase in the energy component;
- A 5% price increase in Prague, due to an increase in the energy component;
- A 4% price increase in Amsterdam and Copenhagen, due to increases in their energy components;
- A 4% price increase in Rome, due to an increase in the energy component;
- A 2% price increase in Riga, due to an increase in the energy component;
- A 2% price increase in Vienna, due to increases in the energy component and the energy taxes;
- A 2% price increase in London;
- A 1% price increase in Paris;
- A 19% price decrease in Berlin;
- A 7% price decrease in Brussels, due to a decrease in the energy component;
- A 3% price decrease in Bern, due to a decrease in the energy component.

¹⁴ The change in each capital city is calculated using the prices in their local currency to exclude the impact of exchange rate fluctuations.

The ongoing upward trend in European end-user prices continued its climb in the natural gas market this month, resulting in increases once again, limited however compared to previous months, while about 3/7 of the capital cities studied are standing once again at record high prices. Specifically, those would be Amsterdam, Athens, Bucharest, Copenhagen, Dublin, Luxembourg City, Madrid, Paris, Prague, Rome, Sofia and Vienna. The main reason driving the end-user prices upwards is the low levels of global gas storages, that combined with increased natural gas demand resulted in the highest gas prices on the wholesale market observed in the past years.

In Athens, the consecutive increases in the wholesale market prices have led to an end-user price more than double compared to 6 months ago. Although, the government introduced additional subsidies to mitigate the impact in December, the bills remain significantly high. The government is even considering the extension of subsidies in 2022, based on income and property criteria¹⁵. On the other hand, the large price decrease in Berlin is the reflection of the decreased wholesale price during the first half of November. However, the German wholesale price continued its increasing trend after mid-November, thus further end-user price increases are expected to follow in the near future. The main driver behind Germany's recent wholesale price fluctuations is related with the country's interconnections and natural gas imports/exports^{16,17}.

Similarly to electricity, measures are being taken in several countries to mitigate the impact of the increased natural gas bills. In Bulgaria, to restrain the increase of energy prices, the Bulgarian lawmakers froze the regulated prices for power and heating until March 2022¹⁸; they are also planning a 4-month financial-rescue plan of 1.5 billion leva (0.77 billion Euro) for businesses, distribution companies, and utilities¹⁹. At the same time, the Danish gas grid operator (Energinet) is calling market players to store gas ahead of winter's peak demand²⁰, to help the market move from its current vulnerable state, ensure the stability of supply and avoid extreme price hikes.

In the same vein as for electricity, gas prices at PPS offer a very different outcome from the actual prices. This month, Budapest, Bratislava and Belgrade were the cheapest cities when adjusted to PPS (Figure 7).

¹⁵ Imerisia: [“Ρεύμα - Φυσικό αέριο: Ποδαρικό με αυξήσεις φωτιά το 2022 - Η επίδραση των εκπτώσεων”](#), 19.12.21

¹⁶ Reuters: [“Russian gas flows to Germany through Yamal restart, sending prices lower”](#), 04.11.21

¹⁷ RFE/RL: [“European Natural-Gas Prices Jump Again Following Germany Delay of Nord Stream 2”](#), 17.11.21

¹⁸ Reuters: [“Bulgaria freezes power prices for households until end-March”](#), 16.12.21

¹⁹ Reuters: [“Bulgaria plans \\$866 mln aid to help businesses with soaring energy costs”](#), 21.12.21

²⁰ S&P Global: [“Denmark calls on market players to store gas amid system vulnerability”](#), 03.12.21

Figure 7 Residential gas prices including taxes at PPS

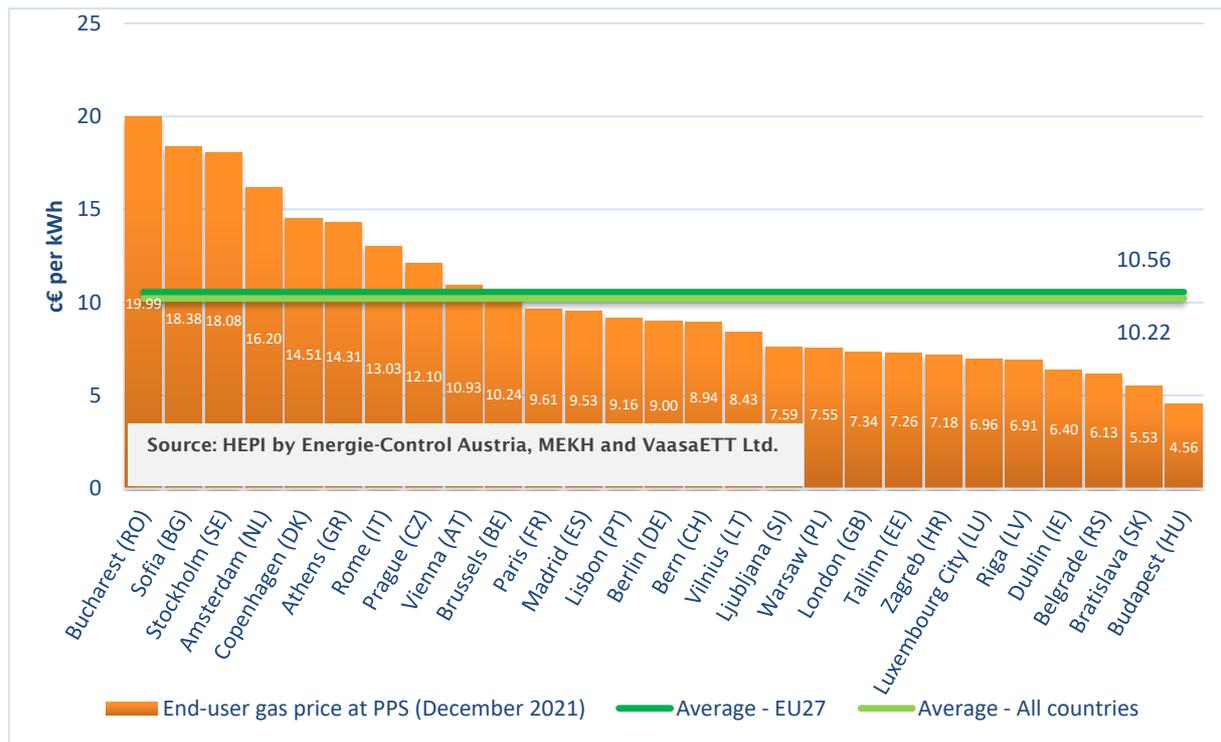
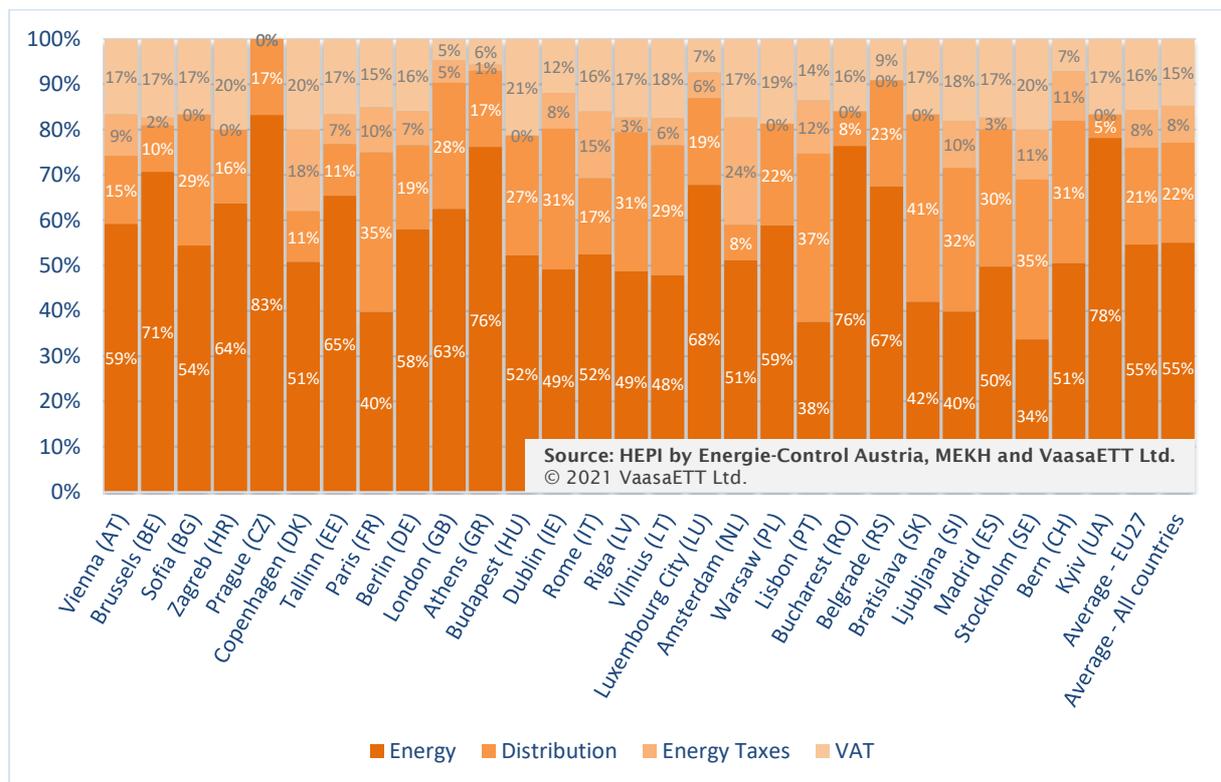


Figure 8 Residential gas price breakdown²¹



²¹ Please note that proportions appearing in the graph are rounded, and due to this may not add up to 100%

Our survey shows that on average, energy (the contestable component of the price) represents 55% of the end-user price of natural gas, distribution 21%, energy taxes 8% and VAT 16% for the European capitals. In the Netherlands, energy taxes are used for nudging the consumers' behaviour and energy use. Even more so starting from January 2020, the energy tax for residential natural gas user is typically 24%. The aim is to encourage the use of electric heating and appliances instead of gas.

Overall, results show that market forces represent only about half of the end-user price both for electricity and gas, whereas national fiscal and regulatory elements are responsible for the other half through distribution tariffs, energy taxes and VAT. In places where the energy component is lower, so is the incentive for customers to look for more competitive offers²².

Visit our project webpage at <http://www.energypriceindex.com> and subscribe to the free monthly update of the HEPI index for Europe.

²² You may download the latest version of VaasaETT's survey of utility customer switching at <http://www.vaasaett.com/projects-2/#ucsrp>.

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Energie-Control Austria

Energie-Control Austria was set up by the legislator on the basis of the new Energy Liberalisation Act and commenced operation on 1 March 2001. Energie-Control is headed by Mr. Wolfgang Urbantschitsch and Mr. Andreas Eigenbauer as managing directors and is entrusted with monitoring, supporting and, where necessary, regulating the implementation of the liberalisation of the Austrian electricity and natural gas markets. **More at:** www.e-control.at

The Hungarian Energy and Public Utility Regulatory Authority

The main responsibilities of the Hungarian Energy and Public Utility Regulatory Authority are consumer protection, providing regulated access to networks and systems, carrying out regulatory competencies in order to maintain security of supply and fostering competition. The scope of the infrastructures, which have to be overseen by the Hungarian Energy and Public Utility Regulatory Authority, has been extended in 2011 with the complete regulation of district heating and in 2012 with the water public utilities. As market progresses are becoming more widespread, we put emphasis on our market monitoring task and we pay specific attention to regional market integration both in electricity and natural gas. **More at:** www.mekh.hu

VaasaETT

VaasaETT is a research and advisory consultancy dedicated to customer related issues in the energy industry. VaasaETT advises its clients based on empirical evidence brought about from extensive research in the area of customer behaviour and competitive market behaviour (including smart energy offerings, demand response, energy efficiency, smart home, smart grid). VaasaETT's unique collaborative approach enables it to draw on an extensive network of several thousand energy practitioners around the world who can contribute to its research activities or take part in industry events it organises allowing VaasaETT to integrate global knowledge and global best practice into its areas of expertise. VaasaETT's truly global focus is reflected by research and strategic support having been provided to a diverse array of organisations on 5 continents including for instance 28 of the Fortune Global 500 companies, the European Commission, Government and public research bodies in Europe, Japan, the UAE, the Middle East and Australia. **More at:** www.vaasaett.com