FORBEG

A European comparison of electricity and natural gas prices for residential, small professional and large industrial consumers

May 2023

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List of acronyms

AMR	Automatic meter reading
BE	Belgium
BT	Basse Tension It encompasses consumers connected to the distribution grid on a voltage level < 1 kV.
CHP	Combined Heat and Power
CU	Consumption unit
CHPC	Combined Heat and Power Certificates
DCM	Distribution Charging Methodology
DE	Germany (abbreviation from ‘Deutschland’)
DSO	Distribution System Operator
EAN	European Article Number
EEAG	Guidelines on State aid for environmental protection and energy 2014-2020
EHV	Extra-High Voltage
FR	France
FPS	Federal Public Service (see FOD in Dutch or SPF in French)
GC	Green Certificates
GRAPA	La Garantie de revenus aux personnes âgées
GRDF	Gaz Réseau Distribution France
HH	Half Hourly
HHI-Index	Herfindahl-Hirschman Index
HS	Hoogspanning
HT	Haute Tension
IGO	Inkomensgarantie voor ouderen
kV	kilo Volt
kWh	kilo Watt-hour
KWKG	Kraft-Wärme-Kopplungsgesetz (see CHP in English)
LS	Laagspanning It encompasses consumers connected to the distribution grid on a voltage level < 1 kV.

LT	Long-term
LTSO	Local Transmission System Operator
MPA	Meter Point Administration Number
MS	Middenspanning It encompasses consumers connected to the distribution grid on a voltage level ranging from 1 to 26 kV.
MT	Moyenne Tension It encompasses consumers connected to the distribution grid on a voltage level ranging from 1 to 26 kV.
MWh	Mega Watt-hour
NBB	National Belgian Bank
NCG	NetConnect Germany
NHH	Non-Half Hourly
NL	The Netherlands
OFGEM	Office of Gas and Electricity Markets (UK)
PPP	Purchasing Power Parities
PSO	Public Service Obligation
PSWC	Public Social Welfare Centre
RTI	Reference Tax Income
SME	Small and medium-sized enterprise
SR	Switching rate
ST	Short-term
TRANS-HS	TRANS-HS comes from “Transformatorstation hoogspanning” for which DSOs are directly connected to the transformer stations.
TRANS-MT	TRANS-MT comes from “Transformation moyenne tension” for which DSOs are directly connected to the transformer stations.
TSO	Transmission System Operator
UK	The United Kingdom
VAT	Value-Added Tax
YMR	Yearly meter reading

1. Executive summary

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English version

In this study, the prices of electricity and natural gas for residential, small professional and industrial consumers are compared between Belgium and four of its neighbouring countries (France, Germany, the Netherlands and the UK). When deemed more relevant, the results of this study are presented at regional level rather than on a countrywide basis.

This report focuses explicitly on energy prices in force in January 2023, except for residential profiles that take prices in force in February 2023. This exception is linked to the data collection process, initiated at the end of January, where the price comparison tools in some countries/regions were already only displaying prices applicable as of February 2023.[1] As for last year's edition, this is an important aspect to keep in mind considering the current volatility of electricity and natural gas prices. Due to an economic situation that remains challenging in Europe this year, we have decided to take the same approach as last year regarding the measures taken by the different governments to reduce energy prices. We therefore also include in this study an overview of the measures that were implemented after January 2023 in chapter 8 "Comparison of social measures for residential consumers" when relevant. We believe this represents a better way to assess the electricity and natural gas price impact on the adjusted disposable household's income than only focusing on what was in place in February 2023.

Before going into the details of the methodology, we would like to summarise here the most relevant changes observed in comparison with the situation of January 2022:

- For electricity, we can draw different conclusions depending on whether it is about small or large profiles. For residential and SSME profiles, a relatively small evolution in the total electricity price is observed in most countries, mainly due to support and/or protection mechanisms keeping the commodity price under control. On the other hand, medium-sized and large industrial consumers have been hit by a price shock of the commodity price, the cost per MWh almost having doubled compared to the last year.

- For natural gas, we observe on average an increase in the commodity prices compared to last year, for all professional profiles. This general increase is however much less pronounced than last year in the same period. On the other hand, for residential consumers, we can observe a slight decrease of the total natural gas bill in Belgium, Germany and the Netherlands. France and the UK have seen their price continue to rise, the UK being particularly affected by this price increase.

The **consumer profiles** under review were set by the Terms of Reference of this study and remain in line with the previous comparative studies conducted by PwC for the CREG and the VREG[2]. In total, 13 different consumer profiles were studied: 8 for electricity (1 residential, 2 small professional and 5 industrial consumers) and 5 for natural gas (1 residential, 1 small professional and 3 industrial consumers). The tables below synthesize, albeit non-exhaustively, specific characteristics of our consumer profiles for which further hypotheses can be found in chapter 3.

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[1] To avoid any bias when comparing the different countries/regions in scope of this study, it was therefore decided to use the prices in force in February 2023 for residential profiles even when January 2023 prices were still available.

[2] Previous year's studies on the residential and industrial consumers can be found on the CREG website:
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20220513EN.pdf (2022 edition)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20210517EN.pdf (2021 edition)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20200520EN.pdf (2020 edition)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20200520-errata.pdf (errata 2020 edition)

Electricity consumer profiles

Profile	Consumer type	Annual demand (MWh)	Contracted capacity (kW)	Annual peak (kW)
E-RES	Residential	3,5	7,4	-
E-SSME	Small professional	30	37,5	30
E-BSME	Small professional	160	125	100
E0	Industrial	2.000	625	500
E1	Industrial	10.000	2.500	2.000
E2	Industrial	25.000	5.000	5.000
E3	Industrial	100.000	13.000	13.000
E4	Industrial	500.000	62.500	62.500

Natural gas consumer profiles

Profile	Consumer type	Annual demand (MWh)	Contracted capacity (kW)
G-RES	Residential	23,26	-
G-PRO	Small professional	300	-
G0	Small professional	1.250	-
G1	Industrial	100.000	20.000
G2	Industrial	2.500.000	312.500

The comparison looks at three **components** of the energy bill: commodity costs, network costs and all other costs (taxes, levies and certificate schemes). A fourth component, the VAT, is only considered for both electricity and natural gas residential profiles.

An extensive description of the energy prices composition and components (chapter 4 and 5) precedes price comparison results (chapter 6). Energy costs are analysed following a bottom-up approach, leading to a detailed description of the various price components and their application within the countries considered in this study.

For both electricity and natural gas, this report notes great differences in the price structure between the different regions and countries, including the setting of network costs and tax regimes. This adds an additional layer of complexity for a fair comparison across all countries/regions covered in this study.

Comparison of electricity prices

Comparison of electricity prices for residential and small professional consumers

Compared to last year, the most remarkable difference is the decrease of the commodity price for the E-RES profile in two countries: Belgium and Germany. The Netherlands, the UK, and France to a lesser extent, have seen a global increase of their costs. For residential consumers, similarly as last year, France offers the lowest yearly bill since the standard product for residential consumers remains regulated by the Government. After France, Flanders is the region under review having the second lowest annual electricity bill for residential consumers, closely followed by Brussels and Wallonia[3].

Electricity price by component in EUR/MWh (profile E-RES)

[3] (Brugel, 2022) - It has to be noted that the price comparison tools used for the 3 regions in Belgium, have undergone changes in the price computation methodology, using forward looking prices as from 2023, instead of historical price.

Germany, while not being the cheapest country regarding electricity for residential consumers, has seen its total electricity bill decreasing this type of consumers, which is due to a lower commodity price[4]. On the other hand, the Netherlands is the country where people pay the most, with the highest increase of the "commodity" component. The Netherlands also remains the only country with a "negative" value for "all other costs" component of the invoice, due to tax rebates practiced (i.e. "Belastingvermindering per elektriciteitsaansluiting"). The introduction of a price cap for small consumers (E-RES and E-SSME) in the Netherlands has not helped in maintaining an average competitive position for the country, and is not as effective as the price cap applicable in Germany. It has to be noted that both Belgium and the UK do have a competitive advantage regarding the VAT component as they apply a much lower rate (respectively 6% for Belgium, and 5% in the UK) than other countries in the scope of this study.

For 2023, France remains the cheapest country for the E-SSME profile due to the price guarantee mechanism in place, coupled with strong and appealing incentives and fiscal system. The most notable difference from last year results is the better competitive positions of Belgium, being the only region with a commodity cost that does not increase overall. The Netherlands remains the most expensive country mainly due to its highest commodity costs and fiscal contributions. Total electricity bill for that profile is in Belgium lower than the one observed last year, Flanders now being the cheapest region in Belgium, closely followed by Brussels and finally Wallonia.

Electricity price by component in EUR/MWh (profile E-SSME)

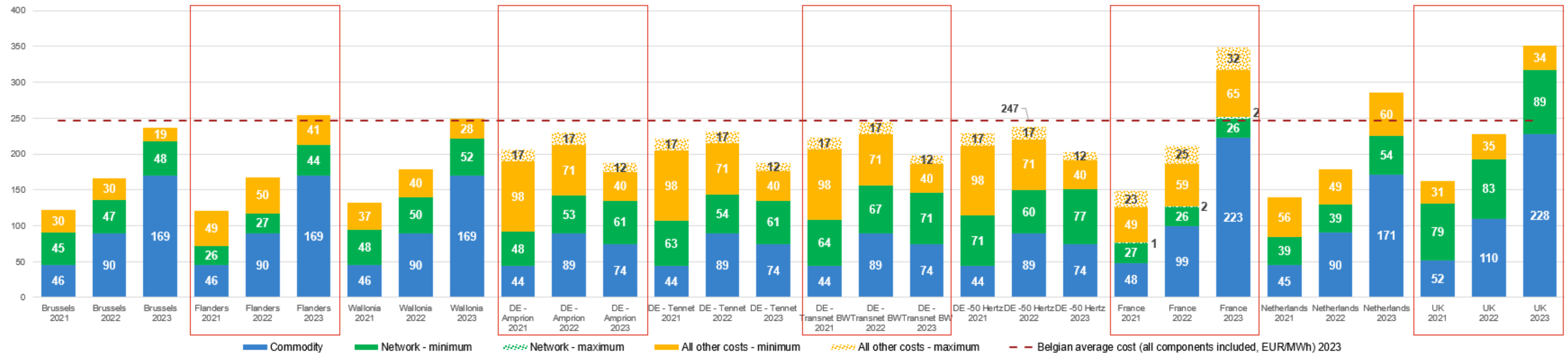
[4] The introduction of a price cap for small consumers for up to 80% of the consumption (including taxes, levies and other costs), limits the cost for residentials to 0,40 EUR/kWh, virtually decreasing the commodity cost when taking network costs, VAT and all other costs are fixed values per year or evolving depending on the electricity consumed, according to the formula:

$$0{,}40 * Yearly\ Consumption = 80\% * (All\ Other\ Costs + Network\ Costs + Commodity\ Costs) * VAT$$

While in Belgium the commodity prices stabilised (and even decreased) across regions since last year for E-RES and E-SSME, it is not true for E-BSME and E0-E4 profiles. There is, for the second year in a row, a significant increase in the commodity price. This increase is also visible in all other countries/regions in the scope of this study, except Germany. The trend can partially be explained by the way energy prices are computed for those profiles. The formula used for the larger profiles in electricity mainly considers the forward prices for 2023 from 2020 (forward 3y), 2021 (forward 2y) and 2022 (forward 1y). As a result, the increase in spot prices in 2022 and 2023 is only partially visible in the final results, as the forward prices that are taken from the last years did not bear all information of higher commodity prices yet. Hence, the forward prices of the previous years have a tendency to minimise the impact of higher prices seen today (which can be up to 4 times their prices of 2 years ago).

For E-BSME profile, and in opposition to previous years, France and the UK are now showing the most expensive electricity bill. Germany displays the most competitive bill because it has lower commodity costs (explained by the price cap applied for 2023). Belgium is the second cheapest country. In Belgium, Brussels is the cheapest region for that profile mainly due to a lower regional taxation scheme and is followed by Wallonia and then Flanders.

Electricity price by component in EUR/MWh (profile E-BSME)



Comparison of electricity prices for industrial consumers

As opposed to the residential and small professional consumers, the large increase of the commodity price in all regions/countries under review remains global for larger consumers except for Germany thanks to its capping mechanism. If all discounts are considered, the lowest cost of electricity for the E0 consumer profile is found in Germany (more precisely Tennet and Amprion regions), followed by the Netherlands and Flanders. A low commodity cost, and potential in the reduction of all other costs (i.e. taxes, levies and certificate systems) mostly explain these lower prices in Germany. If we omit Germany and its capping mechanism, Belgium is in the low average of the annual bills of other countries studied for E0, E1 and E2 profiles, while the UK remains the most expensive.

The result for the Netherlands is highly variable depending on the electro intensity. While it offers average prices that are lower than almost all other countries when the reductions on all other costs apply to electro-intensive consumers, industrial consumers in the Netherlands face a lower competitive position when these reductions do not apply.

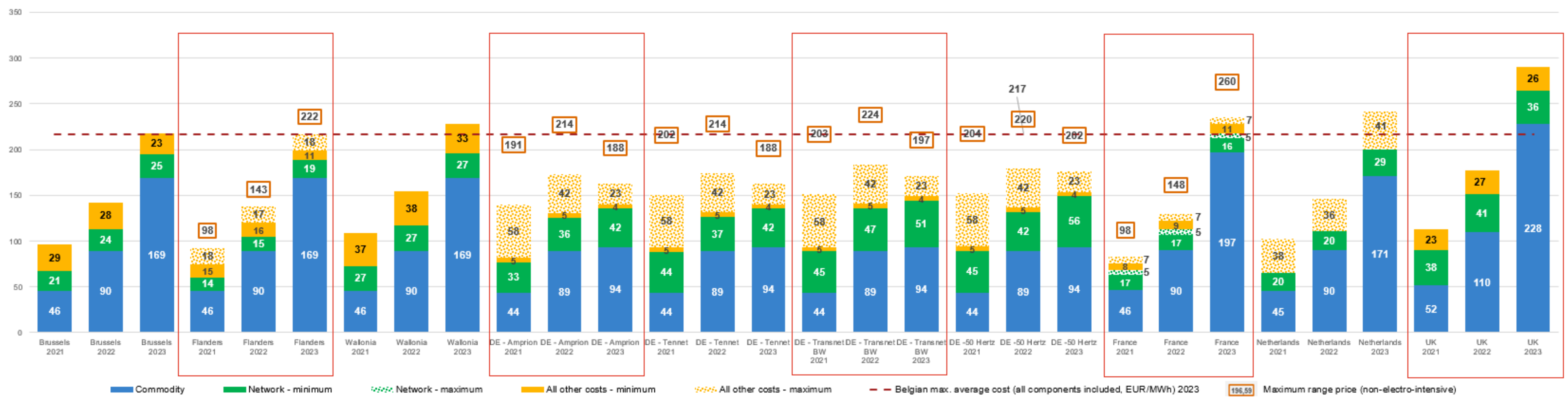
The prices in the UK are the highest, but do not consider the electro-intensity of the consumers in the application of charges.

Within Belgium, the cost of electricity is on average higher in Wallonia, followed by Brussels for E0, E1 and E2 profiles[5]. Flanders can be the cheapest region in Belgium for these three profiles due to lower minimum all other costs and lower network costs. The new distribution tariff structure in Flanders introduced on the 1st of January 2023, has not changed its competitive position for E0 and E1. Taking these different observations into account, it confirms Flanders as a competitive region, for electro-intensive and non-electro intensive consumers. For non-electro intensive consumers, the differences between the three Belgian regions become smaller.

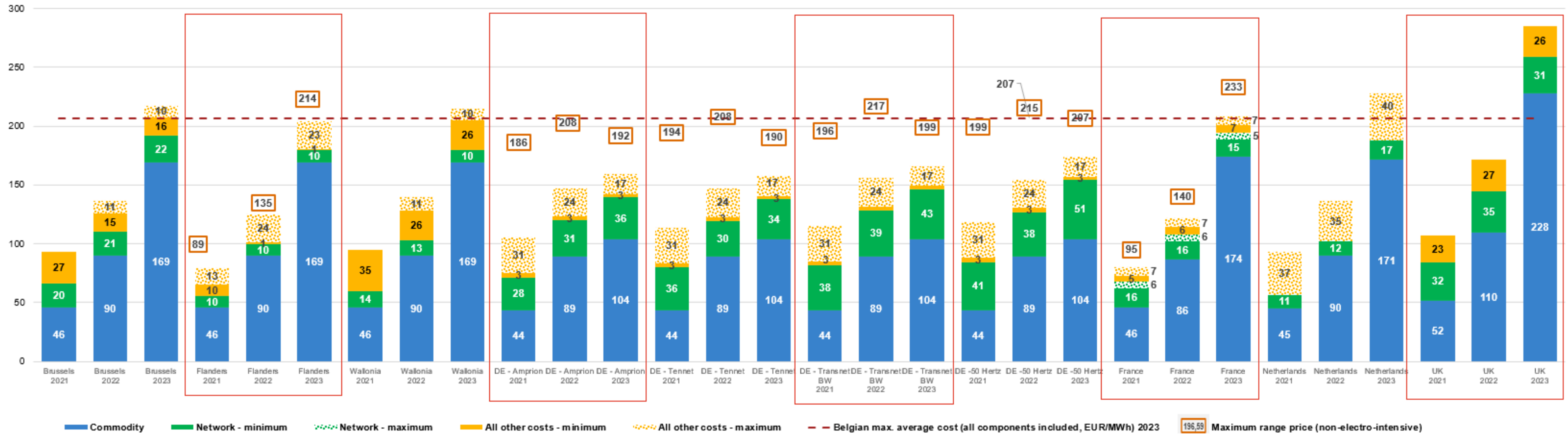
For non-electro-intensive industrial consumers, Belgium is at par with Germany and the Netherlands, while France and the UK are becoming more expensive. The small difference between electro-intensive and non-electro-intensive profiles bills is an advantage for Belgium's competitive position, when comparing non-electro-intensive consumers among themselves. However, it also means that electro-intensive consumers do not possess a reduction scheme that is as advantageous in Belgium as in Germany for instance.

[5] Unlike the previous studies, the degression factor on the Walloon transport costs has been applied in 2023. This degressive factor of the costs according to the electric intensity of the consumer, enables the reduction of transport costs paid by the Walloon E0 and E1 profiles. It is therefore necessary to take this into account when making comparative analyses between Wallonia and other regions, or Belgium and other countries.

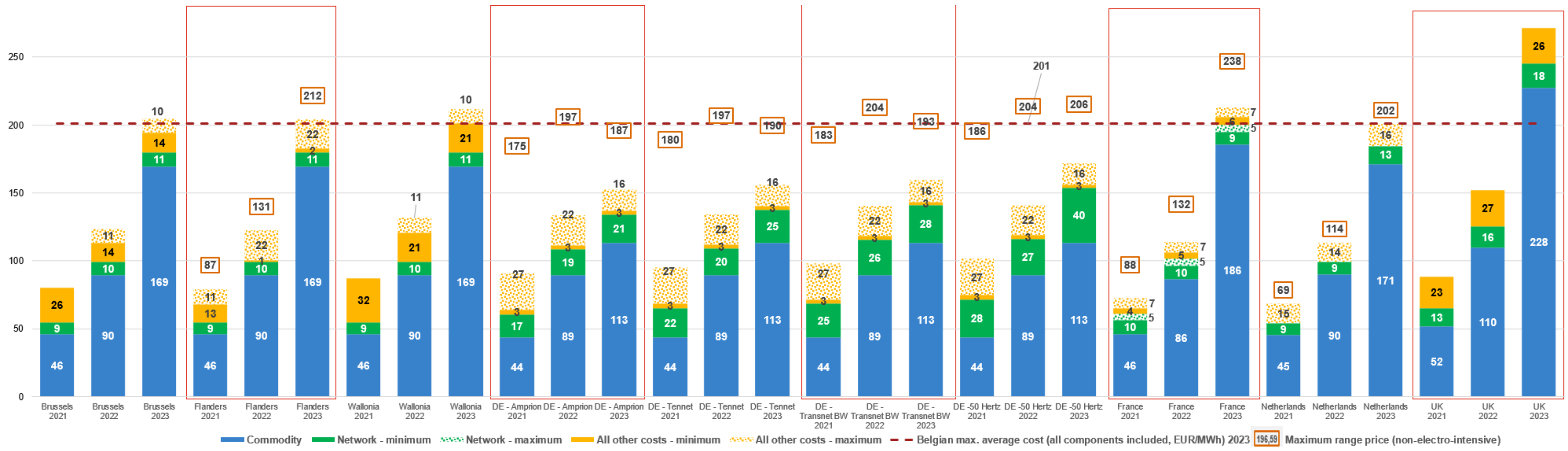
Electricity price by component in EUR/MWh (profile E0)



Electricity price by component in EUR/MWh (profile E1)



Electricity price by component in EUR/MWh (profile E2)



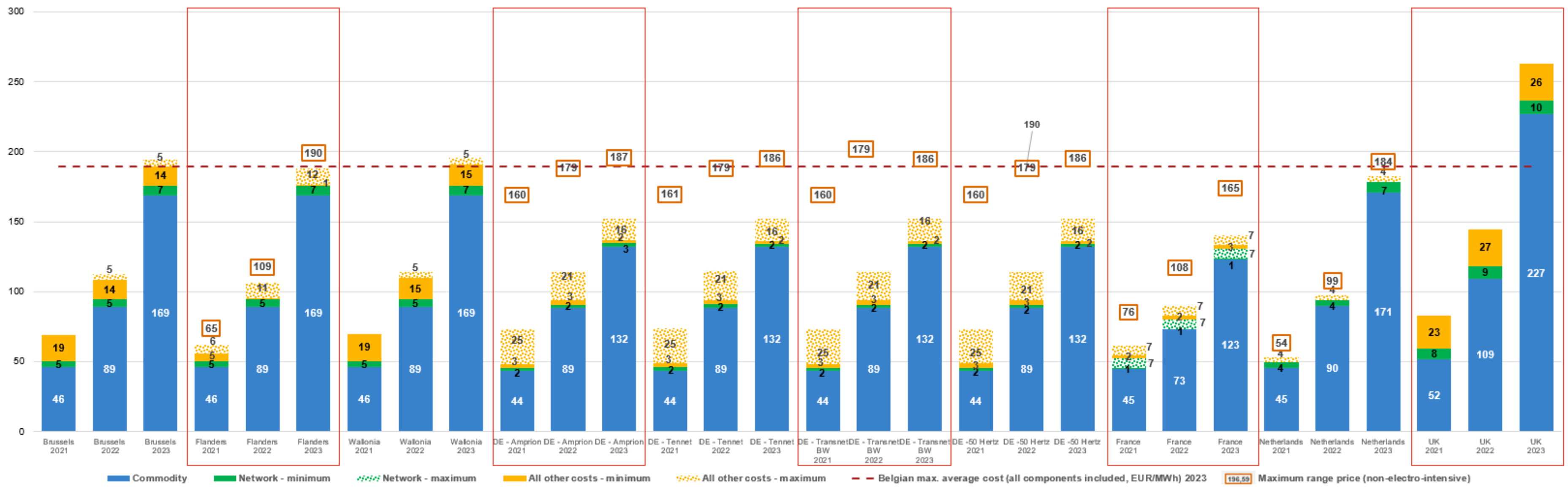
When considering E3 and E4 profiles, France remains the country with the lowest total invoice of all countries under the scope of this study, mainly due to the ARENH[6] mechanism in place. At the other end of the spectrum, the UK remains the most expensive country for E3 and E4 profiles. This is explained by commodity prices that are more than 35% higher than in any other country. For E3 and E4 profiles, we observe two groups of countries. Those facing low converging prices such as France and Germany, and medium-converging prices for the Netherlands and Belgium, while the UK is an outlier.

In Belgium, we observe that for E3 and E4 profiles, Flanders is always the most competitive region for electro-intensive consumers, and its position is challenged for non-electro intensive consumers, which is relatively in line with the result from last year. Since the commodity costs and network costs are harmonised over all Belgian regions, this purely depends on the “all other costs” component. It is important to note that the biggest energy consumer in Brussels is closer to an E3 profile than an E4 one, and the E4 profile is thus a purely theoretical observation for this region due to the absence of very large industrial consumers in the Brussels region.

[6] ARENH stands for « Accès Régulé à l’Électricité Nucléaire Historique » (Regulated Access to Historic Nuclear Electricity). This is a mechanism that allows all alternative suppliers to obtain electricity from EDF (the historical electricity supplier in France) under conditions set by the public authorities.

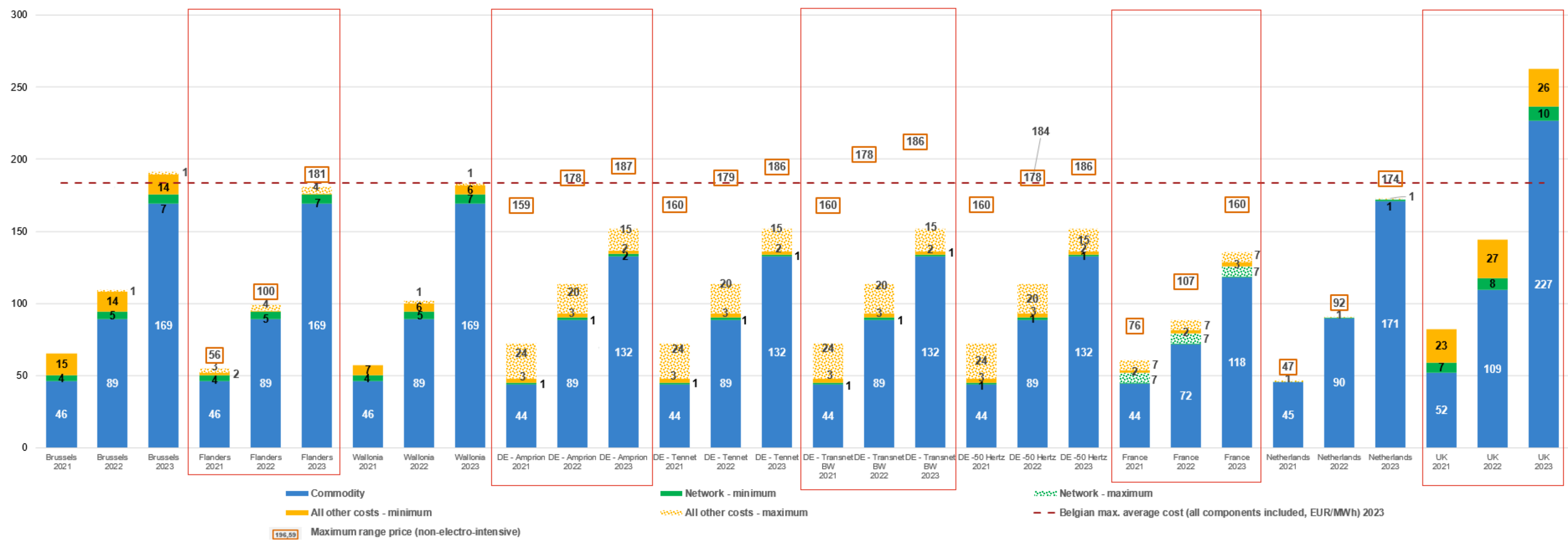
For E3 profile, and despite its lower commodity prices in line with other countries (second to France and Germany), Belgium remains handicapped by higher all other costs, especially in Brussels and Wallonia. The notion of electro-intensity does not provide as much reductions as in Flanders, where the all other costs component is lower than in the other regions. Belgium is on average slightly more expensive, when looking at non-electro intensive profiles, than the Netherlands, but less than the UK and Germany. Belgium's taxes, levies and certification scheme costs would be aligned with those of Germany and the Netherlands if they did not apply reductions for electro-intensive consumers.

Electricity price by component in EUR/MWh (profile E3)



The E4 profile shows a similar trend to the E3 profile, with France being the cheapest country, followed by Germany and the Netherlands. The Netherlands and Belgium are converging regarding the total electricity bill but with differences in their price structure. Compared to the Netherlands, Belgium shows (similarly to the E3 profile) relatively high all other costs components, slightly smaller commodity prices and higher network costs. Once again, the UK remains by far the most expensive country here.

Electricity price by component in EUR/MWh (profile E4)



Regarding electricity for industrial consumers, the report highlights the great complexity due to government interventions to reduce electricity costs for certain categories of large industrial consumers. These interventions aim to influence the burden of grid costs and the components of all other costs (i.e. taxes, levies, certificate systems). Belgium, France, Germany and the Netherlands apply tax reductions/caps granted based on a series of specific economic criteria generally related to electro-intensity. If specific reductions can directly be applied (e.g. network costs reductions in Germany), we have presented the results for the wide range of possibilities. As far as tax reductions are concerned, the criteria (annual offtake from 10 GWh or activity) set by the Netherlands are the least demanding. The application of these reductions leads to a change in the competitive position of the other countries in scope: Germany gains a very competitive position for each profile studied, for consumers who do meet the reduction criteria and thus are electro-intensive; the Netherlands and Flanders, become slightly cheaper; and France remains the most competitive region observed, which is made even more important thanks to these reductions. Finally, France is the only country to have alleviated the increase in commodity cost thanks to the ARENH mechanism, together with Germany, via the introduction of the price cap in 2023. The UK still does not offer a reduction/exemption for electro-intensive consumer, which impacts its relative competitiveness.

Comparison of natural gas prices

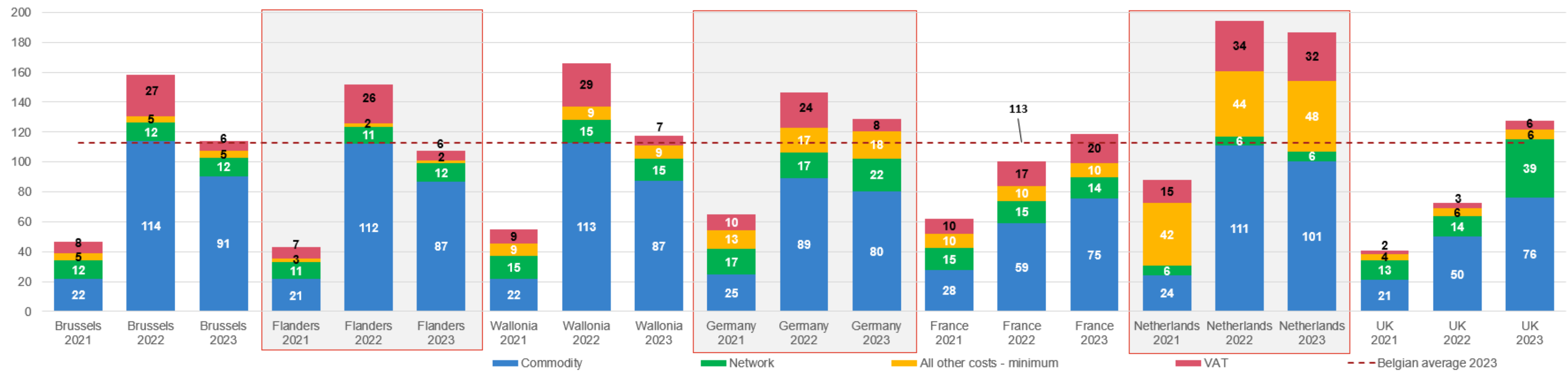
Comparison of natural gas prices for residential and small professional consumers

For residential consumers (G-RES), Belgium is the least expensive country in 2023, closely followed by France, the UK and Germany. The Netherlands is the most expensive country for residential consumers. The good results of Belgium can be explained by lower network costs and a low VAT component. Within Belgium, Flanders is cheaper than Brussels and Wallonia due to lower other costs. Wallonia has the highest network costs, and Brussels has the highest commodity costs in 2023. On the other side, the good performance of France and the UK can be explained by the lowest commodity prices among the regions/countries under review. As it was already the case last year, Germany still stands in the middle of the pack, with prices higher than Belgium and France, but lower than UK and the Netherlands. Germany's commodity costs and VAT dropped, but network and other costs increased in 2023.

If we compare with results from last year, Belgium, Germany and the Netherlands see their prices going down, with Belgium experiencing the greatest decrease. Despite a decrease, the Netherlands remains the most expensive country because of higher taxes and higher other costs than the other regions/countries analysed. On the other hand, France and the UK see their prices rising from last year by respectively 19% and more than 75%. Where in 2022 the UK had lower commodity costs compared to the other regions/countries, the total invoice of natural gas for residential consumers grew due to a higher commodity price together with higher network costs.

It is also important to note here as well that the price comparison tools used for the 3 Belgian regions have changed price computation methodologies: using forward looking prices in 2023, instead of historical prices as a basis in 2022.

Natural gas price per component in EUR/MWh (profile G-RES)



For professional consumers (G-PRO), all countries except Germany (thanks to its price capping mechanism) show an increase of the total cost. Germany is the cheapest country in 2023, closely followed by France and Belgium. In Belgium, Flanders has the lowest total invoice followed by Brussels and then Wallonia. Driven by low tax levels (except in Wallonia), the average Belgian invoice is close to the least expensive of all the countries under review and is 23% cheaper than the Dutch's natural gas bill for this profile (the most expensive one).

Natural gas price per component in EUR/MWh (profile G-PRO)

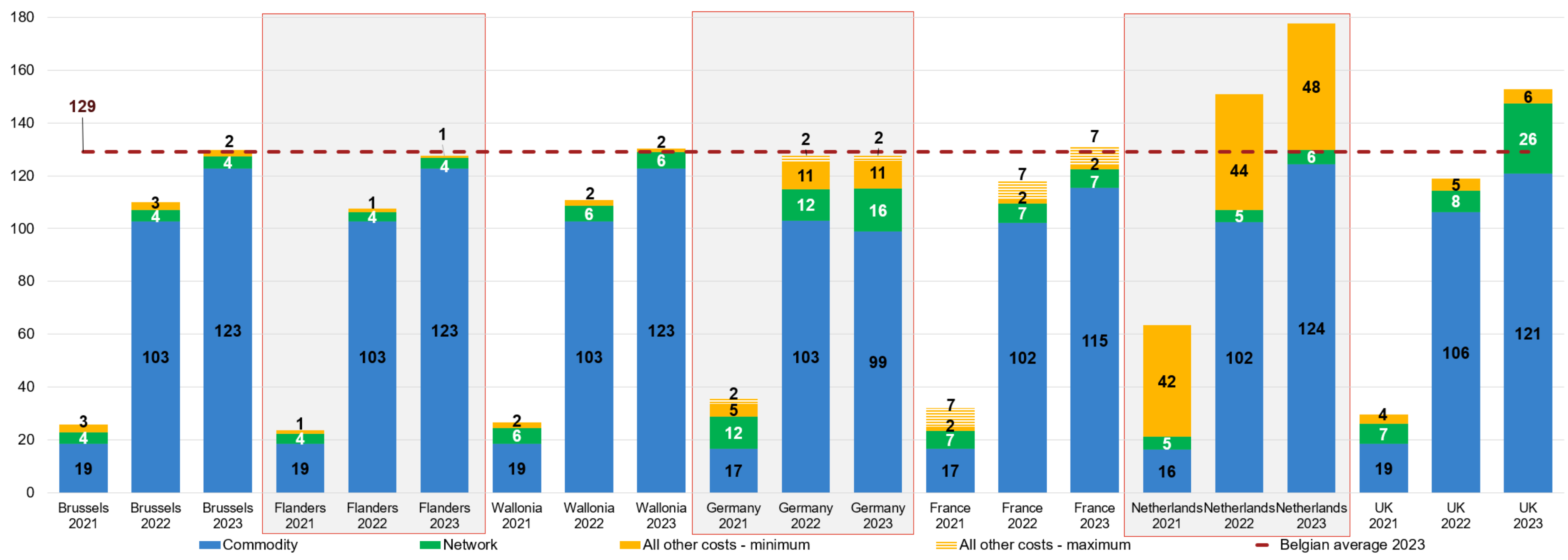
UK stands in the middle of the pack pricewise but is the second most expensive country this year only after the Netherlands. The UK witnesses a rise of its network costs when comparing 2022 and 2023, negatively impacting the total invoice. The Netherlands is the most expensive country for the G-PRO profile, due to the high other costs component.

Comparison of natural gas prices for industrial consumers

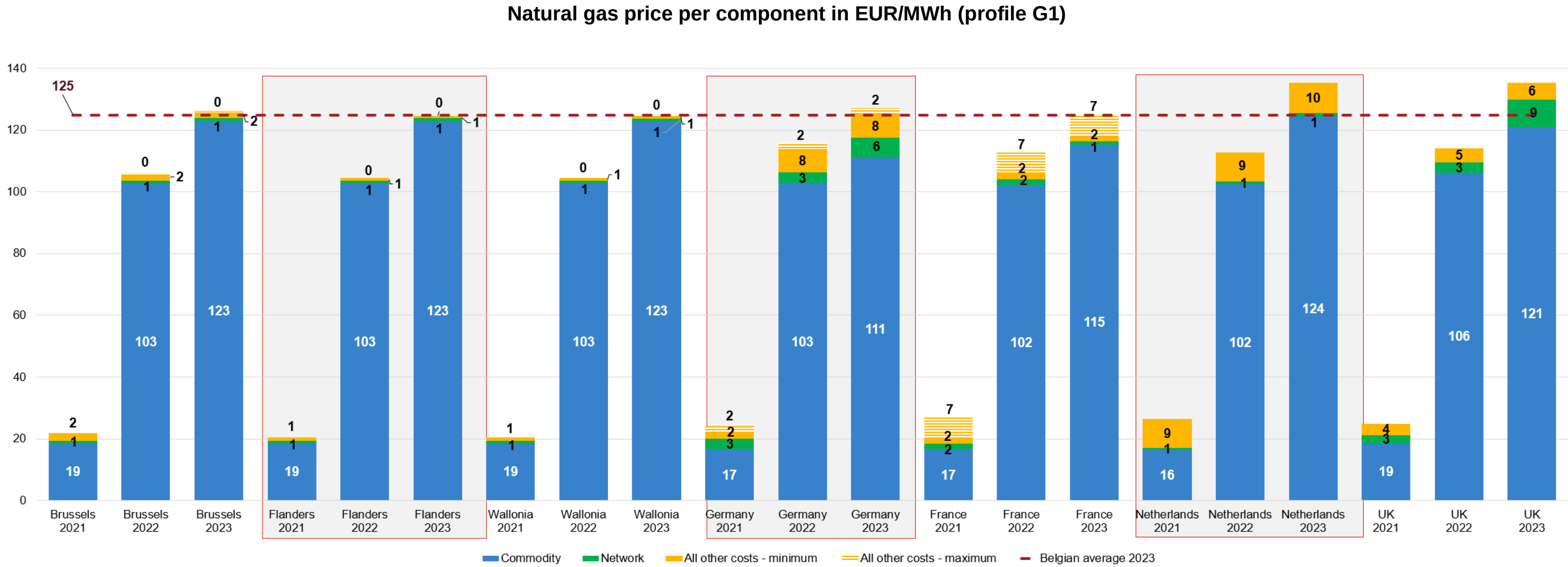
For natural gas, government intervention in network costs and taxes appears to be less noticeable than for electricity. Moreover, the complexity of the mechanisms in place is much lower, even if reductions or exemptions exist.

We observe again this year a rather large increase in the total annual invoice for industrial natural gas consumers, although this increase is lower than the one observed in 2022. Overall, Belgium is once again rather competitive when it comes to natural gas, thanks to its relatively low all other costs and network components prices. For profile G0, Belgium is the second cheapest country without reductions, closely following Germany which is the cheapest country in 2023. With reductions, France becomes the cheapest country. Within Belgium, Flanders is the most competitive region due to the lowest network and other costs, while Wallonia is the most expensive region. The Netherlands is once again the most expensive country due to the high other costs, followed by the UK. As for G-PRO profile, the UK sees once again a large increase in its network costs component. Germany is the only country which has a lower commodity cost in 2023 than 2022.

Natural gas price per component in EUR/MWh (profile G0)

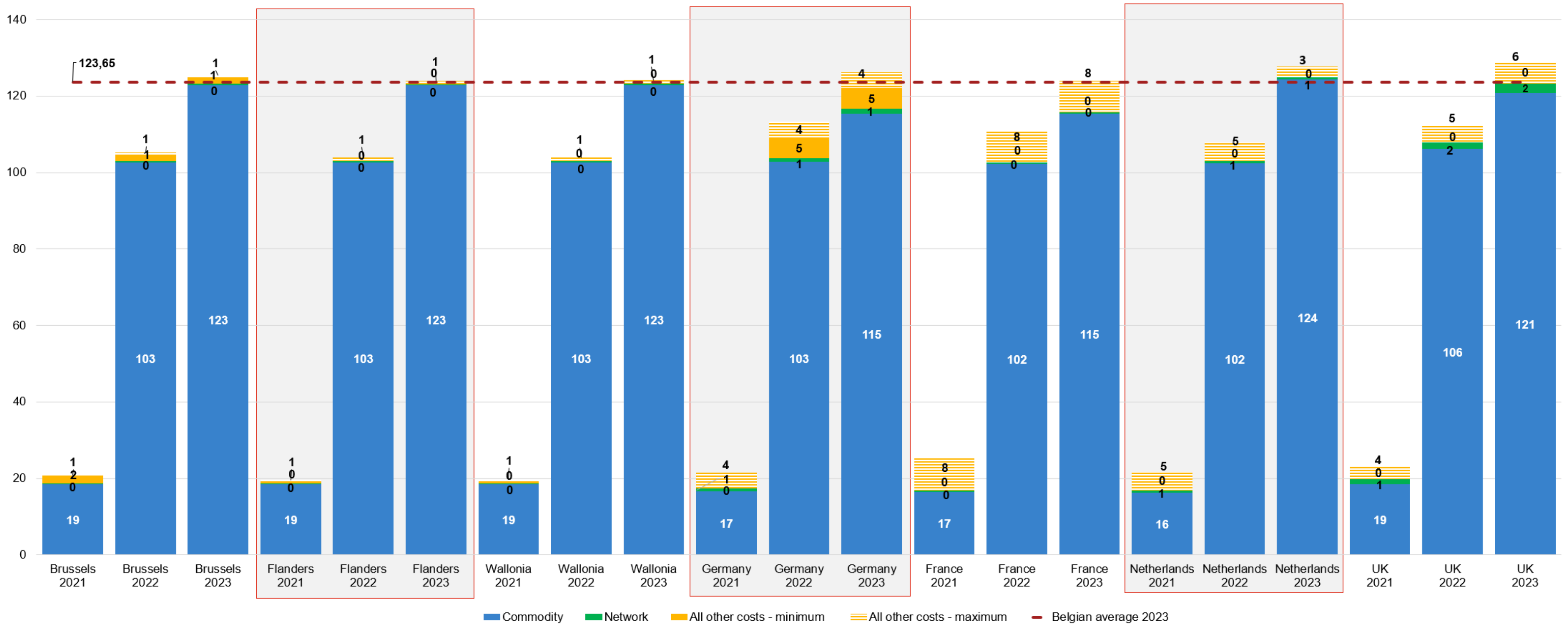


For the G1 profile, France is the least expensive country in 2023 by a small very margin, closely followed by Belgium and Germany, all those countries showing rather similar total bill amounts. The Netherlands is the most expensive country, closely followed by the UK. Although commodity costs have risen in Belgium, in the three regions the network and other costs have stayed rather similar to the 2022 results. In Belgium, Flanders is the cheapest region by the smallest margin, closely followed by Wallonia and Brussels.



For the G2 profile, Belgium is the least expensive country, closely followed by France, when reductions are not taken into account. When maximum reductions apply, then the cheapest country is France, followed by Germany and having the UK and Belgium tied to the third most competitive country position. Commodity prices have risen for all countries, whereas network and other costs have been rather similar to 2022. Germany (mainly due to the capping mechanism) and France do have the lowest commodity costs, but Germany has the highest other costs.

Natural gas price per component in EUR/MWh (profile G2)



Efforts in paying for energy bills for vulnerable consumers

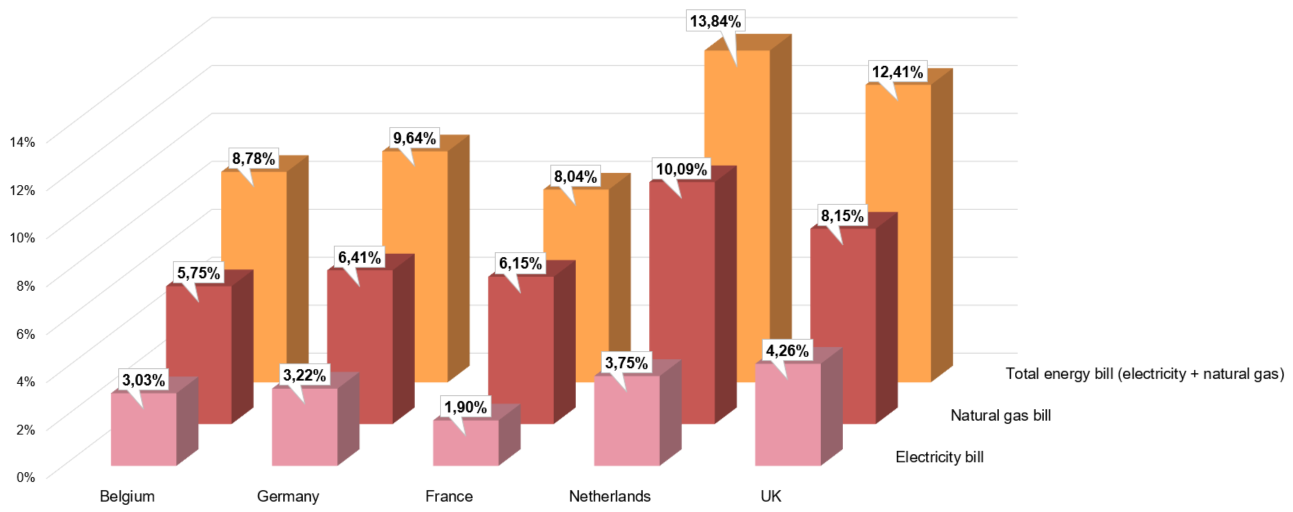
Chapter 8 aims to assess the different measures put in place by the different countries in scope of this study to cushion the impact of rising energy prices and inflation for both residential and professional consumers. Those measures can range from social tariffs to direct financial support to lower consumers' bill. The variety of the measures makes it however complex to perform a cross-country comparison.

It is important to note that the results presented here do not take into consideration one-off reductions on energy bill such as energy credit note in Belgium, energy vouchers in France or discount on the energy tax for electricity in the Netherlands. This is because the amount of those allowances can vary a lot depending on the households' characteristics.

Effort rates compared to the average disposable income (housing costs deducted)

In this first view, we are looking at the weight of the energy bill on a household with an average disposable income (2 working people), after having deducted one of the most significant shares of household spending, namely the cost of housing. The figure below clearly shows that for all countries in scope of this study, the electricity bill has a much lower impact on budget than the natural gas one.

Importance of energy bill compared to average disposable income (in %)



France is the country where the electricity bill weights the least, with less than 2% of the annual disposable income (housing costs deducted). Belgium comes second with an average of around 3% of the disposable income. Germany and Netherlands come after, while the UK is the country where the electricity bill weights the most with more than 4% of the disposable income.

When looking at natural gas, Belgium is the country where the bill weights the least in comparison with disposable income with an average of less than 6%. France comes second, closely followed by Germany, both being around 6%. The UK, and to a greater extent the Netherlands, have the natural gas bill weighting the most with respectively more than 8% and more than 10% of the disposable income.

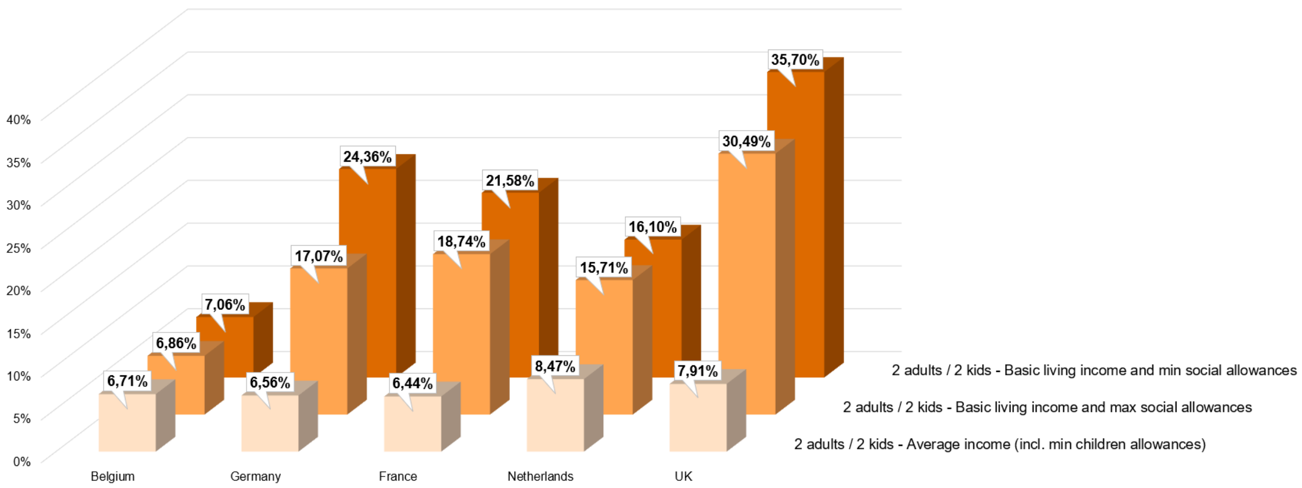
All in all, France is the country where the total weight of the energy bill is the lowest in comparison with disposable income (around 8%), mainly due to its competitive advantage regarding electricity. Belgium comes second with a figure around 9%. The UK and the Netherland are the countries where the energy bill is the heaviest, with more than 12% and almost 14% respectively.

Effort rates compared to a total living wage

In this second view, we assess the weight of the average energy bill on people earning the country's average income against the impact it has on the most vulnerable people. To do so, all social measures that can be quantified are added to the basic income that our typical household (2 adult parents and 2 children) could earn without having other sources of revenue. This time we do not deduct the share of housing from the disposable income. As most households with minimum incomes also often benefit from significant aid in that area too, that would indeed provide a biased picture of reality.

As shown in the figure below, when comparing the effort rate for the total energy bill across countries for a household with an average income, we can see that France is the region where the energy bill weights proportionally the least, closely followed by Germany and Belgium. The UK comes next, followed by the Netherlands, which shows an effort rate around 30% higher than in France.

Total energy bill effort rate compared to living income (in %)



Unsurprisingly, the situation becomes much more complicated when we look at households with the lowest living incomes. In that case, Belgium is able to maintain a rather low weight of the energy bill compared to a basic income in the country thanks to an available social tariff. This helps to keep the weight of the energy bill almost at the same level as for a household with average income.. The Netherlands come next, with a total energy bill counting for about 16% of the available income depending on whether maximum social allowances are received or not. Germany comes next with a total energy bill weighting for approximately 17% when maximum social allowances can be perceived. The situation is however much worse if only minimum social allowances can be perceived. In that case, the energy bill weights for around a quarter of available living income. France comes next with an effort rate ranging from around 19% to 22% for households with the lowest incomes. Finally, the UK is once again the country with the heaviest bill in relation to living income for the most exposed households, with figures ranging from 30% to more than 35% of available income. The total energy bill in the UK could therefore have a disproportionate burden on households most at risk of energy poverty.

Note: The approach followed in this section has limitations as it does not necessarily correspond to the consumption profile of some people in the situation of energy poverty (such as an isolated person without children for instance). Furthermore, it doesn't take either the fact that some more exposed people would decide to consume less energy to lower their energy bill for example. The ultimate objective of this chapter being to determine the effort rate needed to pay the energy bill (and compare it across countries to assess the impact of the energy bill in relative terms), we believe this approach is however robust enough to draw conclusions. Chapter 8 provides further insights on these observations.

Evaluation of Belgian industries competitiveness

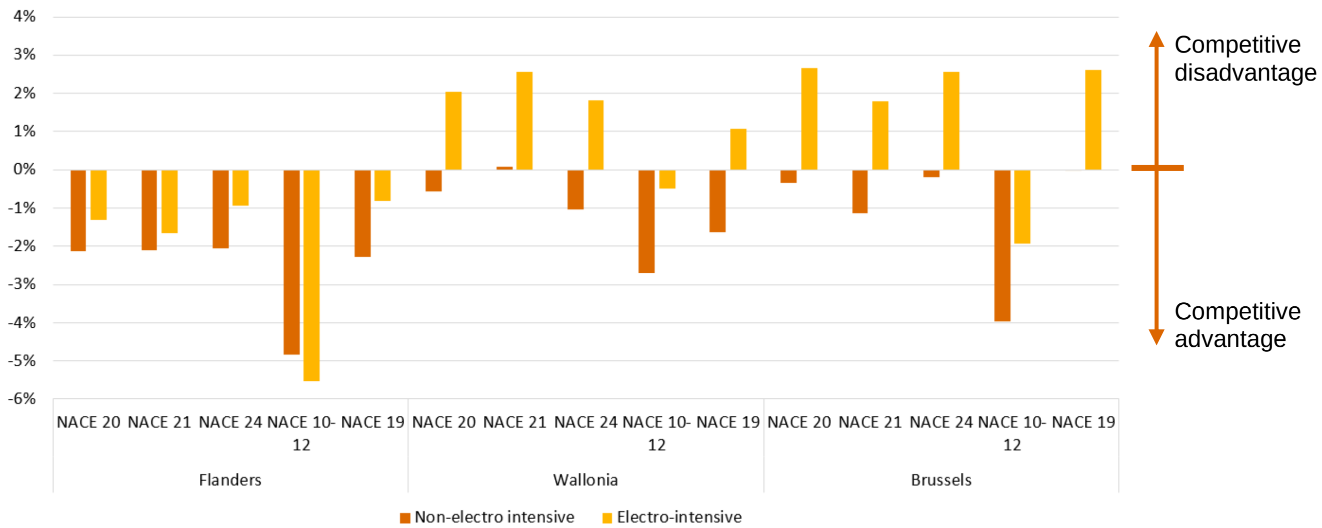
In a last chapter, sector- and region-specific electricity and natural gas prices are analysed through their impact on Belgian industrial consumers' competitiveness compared to their competitors abroad. These results cover industrial consumers from the selected sectors as detailed in section 3.3, namely: food and beverages (NACE 10-12), coke and refined petroleum products (NACE 19), chemicals (NACE 20), pharmaceuticals (NACE 21) and manufacture of basic metals (NACE 24). These sectors range from 0,10% to 2,04% of Belgium's gross value added and from 0,53% to 2,04% of the total employment[7].

As we observed that the UK was a distinctive outlier, results were differentiated depending on its inclusion or not in the comparison. When the UK is included, it stands out from our results that non-electro-intensive industrial consumers in Belgium that compete with non-electro-intensive consumers in the neighbouring countries display a competitive advantage in most sectors, with those in Flanders benefitting from the biggest competitive advantages of Belgium for all sectors in terms of total energy cost. This transforms into competitive disadvantage for all sectors and regions when excluding the UK.

For electro intensive consumers, the difference with and without the UK is even more evident. In fact, all sectors in the three regions show competitive disadvantages when excluding the UK, while their competitiveness improves when including it. For electro intensive consumers, Flanders remains more competitive than its neighbouring countries when including the UK, and it changes to a competitive disadvantage when excluding the UK.

When the UK is included, Belgium's competitive position changed compared to last year. Brussels and Wallonia see their competitiveness decreasing, presenting in most sectors only a competitive advantage for non-electro-intensive consumers and a competitive disadvantage for electro-intensive consumers. On the same trend, Flanders sees its competitive advantage slightly decreasing compared to 2022 for both electro and non-electro intensive consumers, although it remains the most competitive Belgian region.

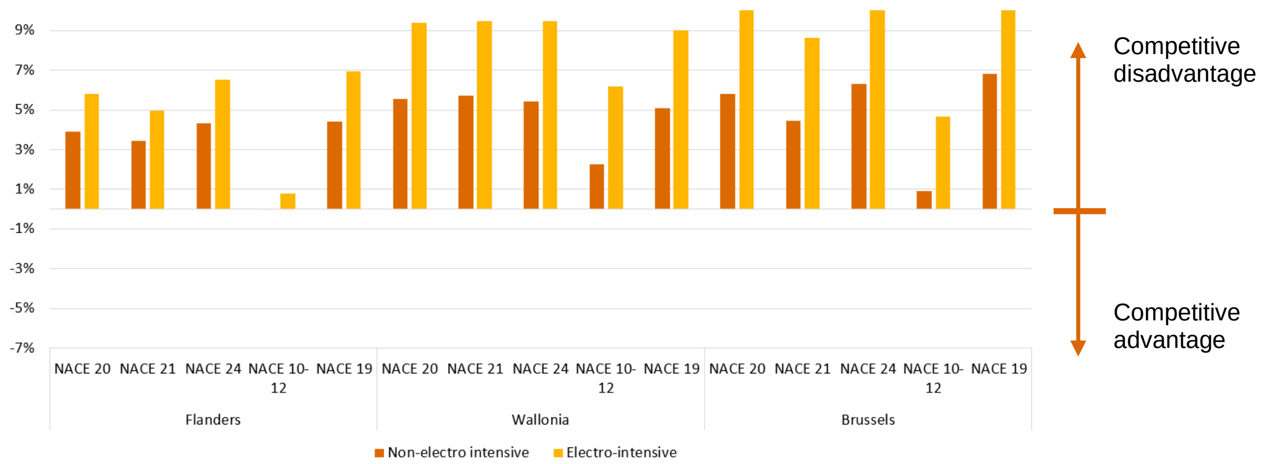
Weighted energy (electricity and natural gas) cost differences between the Belgian regions and the average costs of neighbouring countries (including the UK) for electro-intensive and non-electro-intensive consumers



[7] 2016 national values, which were retrieved from Eurostat.

As stated above, the situation is different when the UK is excluded. In fact, compared to 2022, we observe that Flanders loses its competitive advantage with non-electro-intensive consumers, continuing the decrease over the years. Regarding electro intensive consumers, Flanders presents the same but at a larger scale, competitive disadvantages for all sectors. As it was the case in 2022, electro-intensive consumers in Brussels and Wallonia still present competitive disadvantages. Like the conclusions drawn from the analysis including the UK, we don’t observe a definite convergence across all the regions/countries under review.

Weighted energy (electricity and natural gas) cost differences between the Belgian regions and the average costs of neighbouring countries (excluding the UK) for electro-intensive and non-electro-intensive consumers



Overall, this year non-electro-intensive consumers in Belgium can still benefit from competitive prices compared to their counterparts in the neighbouring countries, despite the large increase of the commodity price. On the other hand, especially in Brussels and Wallonia, electro-intensive consumers are more exposed to a lack of competitiveness. Therefore, despite the efforts already made in Flanders and at Federal level, these results still highlight the need for Brussels and Wallonia to take the necessary steps to improve the competitiveness of their industries. For Flanders, it means keeping the efforts alive to keep some competitivity in some specific industries.

As a conclusion, this could serve as a basis for a more detailed discussion of potential federal and/or regional interventions to strengthen the competitiveness of Belgian consumers by acting, for example, on tariffs and/or taxes. Regarding the latter, the European Commission provides a framework through the CEEAG[8] that could be exploited with regards to the design and/or adaptation of taxes supporting the development of renewable energy.

[8] Guidelines on State Aid for Climate, Environmental Protection, and Energy in the European Union - January 2022

Version française

Dans cette étude, les prix de l'électricité et du gaz naturel pour les consommateurs résidentiels, les petits professionnels et les industriels sont comparés entre la Belgique et quatre de ses pays voisins (France, Allemagne, Pays-Bas et Royaume-Uni). Lorsque cela est jugé plus pertinent, les résultats de cette étude sont présentés au niveau régional plutôt qu'à l'échelle nationale.

Ce rapport se concentre explicitement sur les prix de l'énergie en vigueur en janvier 2023, sauf pour les profils résidentiels qui prennent en compte les prix en vigueur en février 2023. Cette exception est liée au travail de collecte des données, lancé à la fin du mois de janvier, lors duquel les outils de comparaison des prix dans certains pays/régions n'affichaient déjà que les prix applicables à partir de février 2023[9]. Comme pour l'édition précédente, il s'agit d'un aspect important à garder à l'esprit compte tenu de la volatilité actuelle des prix de l'électricité et du gaz naturel. En raison d'une situation économique qui reste difficile en Europe cette année, nous avons décidé d'adopter la même approche que l'année dernière en ce qui concerne les mesures prises par les différents gouvernements pour réduire les prix de l'énergie. C'est pourquoi nous incluons également dans cette étude un aperçu des mesures qui ont été mises en œuvre après janvier 2023 dans le chapitre 8 "Comparaison des mesures sociales pour les consommateurs résidentiels" lorsque cela est pertinent. Nous pensons que cela représente une meilleure façon d'évaluer l'impact des prix de l'électricité et du gaz naturel sur le revenu disponible ajusté des ménages que de se concentrer uniquement sur les mesures en place en février 2023.

Avant d'entrer dans le détail de la méthodologie, nous résumons ci-dessous les changements les plus pertinentes observées par rapport à la situation en janvier 2022 :

- Pour l'électricité, nous pouvons tirer des conclusions différentes selon qu'il s'agisse de profils résidentiels ou industriels. Pour les profils résidentiels et les PME, une évolution relativement faible du prix total de l'électricité est observée dans la plupart des pays, principalement en raison des mécanismes de soutien et/ou de protection des prix mis en place au niveau national. En revanche, les moyens et grands consommateurs industriels ont été plus fortement touchés par un choc du prix des matières premières, le coût par MWh ayant presque doublé par rapport à l'année précédente.

- Pour le gaz naturel, on observe en moyenne une augmentation des prix des matières premières par rapport à l'année dernière, pour tous les profils industriels. Cette augmentation générale est cependant beaucoup moins prononcée que l'année dernière à la même période. D'autre part, pour les consommateurs résidentiels, nous pouvons observer une légère diminution de la facture totale de gaz naturel en Belgique, en Allemagne et aux Pays-Bas. La France et le Royaume-Uni ont vu les prix continuer à augmenter, le Royaume-Uni étant particulièrement impacté par la hausse des prix.

Les types de profils des consommateurs étudiés ont été définis dans les termes de référence de cette étude et restent conformes aux études comparatives précédentes menées par PwC pour le compte de la CREG et la VREG[10]. Au total, 13 profils de consommateurs différents ont été étudiés : 8 pour l'électricité (1 consommateur résidentiel, 2 petits professionnels et 5 consommateurs industriels) et 5 pour le gaz naturel (1 consommateur résidentiel, 1 petit professionnel et 3 consommateurs industriels). Les tableaux ci-dessous synthétisent, de manière non-exhaustive, les caractéristiques des profils de consommateurs pour lesquels d'autres hypothèses peuvent être trouvées dans le chapitre 3.

[9] Pour éviter tout biais lors de la comparaison entre les différents pays et régions entrant dans le périmètre de cette étude, il a été décidé d'utiliser les prix en vigueur en février 2023 pour les profils résidentiels, même lorsque les prix de janvier 2023 étaient encore disponibles.

[10] Les études précédentes portant sur les consommateurs résidentiels et industriels peuvent être trouvées sur le site web de la CREG :
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20220513EN.pdf (édition 2022)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20210517EN.pdf (édition 2021)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20200520EN.pdf (édition 2020)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20200520-errata.pdf (errata édition 2020)

Profils des consommateurs d'électricité

Profil	Type de consommateur	Demande annuelle (MWh)	Capacité contractée (kW)	Pointe annuelle(kW)
E-RES	Residential	3,5	7,4	-
E-SSME	Small professional	30	37,5	30
E-BSME	Small professional	160	125	100
E0	Industrial	2.000	625	500
E1	Industrial	10.000	2.500	2.000
E2	Industrial	25.000	5.000	5.000
E3	Industrial	100.000	13.000	13.000
E4	Industrial	500.000	62.500	62.500

Profils des consommateurs de gaz naturel

Profile	Type de consommateur	Demande annuelle (MWh)	Capacité contractée (kW)
G-RES	Residential	23,26	-
G-PRO	Small professional	300	-
G0	Small professional	1.250	-
G1	Industrial	100.000	20.000
G2	Industrial	2.500.000	312.500

La comparaison porte sur trois **composantes** de la facture énergétique : les coûts de la composante énergétique pure ("commodity"), les coûts de réseau et tous les autres coûts (taxes, prélèvements et systèmes de certificats). Une quatrième composante, la TVA, n'est prise en compte que pour les profils résidentiels de l'électricité et du gaz naturel.

Une description détaillée de la composition et des composantes des prix de l'énergie (chapitres 4 et 5) précède les résultats de la comparaison des prix (chapitre 6). Les coûts de l'énergie sont analysés selon une approche « bottom-up », ce qui conduit à une description détaillée des différentes composantes des prix et de leur application dans les pays considérés dans cette étude.

Tant pour l'électricité que pour le gaz naturel, le présent rapport constate de grandes différences dans la structure des prix entre les différentes régions et les différents pays, notamment en ce qui concerne la fixation des coûts de réseau et des régimes fiscaux. Cela ajoute un niveau de complexité supplémentaire pour une comparaison équitable entre tous les pays/régions couverts par cette étude.

Comparaison des prix de l’électricité

Comparaison des prix de l’électricité pour les profils résidentiels et petites entreprises

Par rapport à l'année dernière, la différence la plus remarquable est la diminution du prix des produits de base pour le profil E-RES dans deux pays : la Belgique et l'Allemagne. Les Pays-Bas, le Royaume-Uni et la France, dans une moindre mesure, ont connu une augmentation globale des coûts. Pour les consommateurs résidentiels, comme l'année dernière, la France offre la facture annuelle la plus basse puisque le produit standard pour les consommateurs résidentiels reste réglementé par le gouvernement. Après la France, la Flandre est la deuxième région à présenter la facture annuelle d'électricité la moins élevée pour les consommateurs résidentiels, suivie de près par Bruxelles et la Wallonie[11].

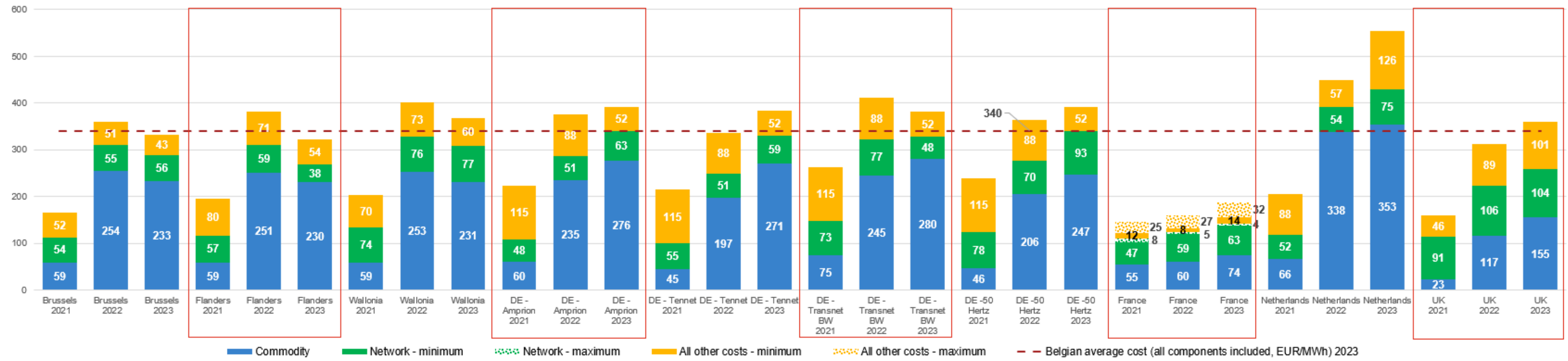
Prix de l’électricité par composante en EUR/MWh (profil E-RES)

[11] (Brugel, 2022) – Il est à noter que le site de comparaison des prix utilisé pour les trois régions belges ont subis des changements méthodologiques de calculs entre 2022 et 2023. Ils utilisent, à partir de 2023, une méthode de détermination des prix prévisionnelle plutôt qu’historique.

L'Allemagne, sans être le pays où l'électricité est la moins chère pour les consommateurs résidentiels, a vu sa facture totale d'électricité diminuer pour ce type de consommateurs, ce qui s'explique par une baisse du prix de la composante énergétique pure[12]. En revanche, les Pays-Bas sont le pays où les consommateurs paient le plus, avec la plus forte augmentation de la composante énergétique pure. Les Pays-Bas restent également le seul pays à afficher une valeur "négative" pour la composante "tous les autres coûts" de la facture, en raison des réductions fiscales pratiquées ("Belastingvermindering per elektriciteitsaansluiting"). L’instauration d'un plafond pour les prix payés par les petits consommateurs (E-RES et E-SSME) aux Pays-Bas n'a pas contribué à maintenir une position concurrentielle pour le pays et n'est pas aussi efficace que le plafonnement des prix applicable en Allemagne. Il convient de noter que la Belgique et le Royaume-Uni disposent d'un avantage concurrentiel en ce qui concerne la TVA, car ils appliquent un taux beaucoup plus bas (respectivement 6 % pour la Belgique et 5 % pour le Royaume-Uni) que les autres pays couverts par cette étude.

Pour 2023, la France reste le pays le moins cher pour le profil E-SSME en raison du mécanisme de garantie des prix en place, associé à des incitants et à un système fiscal forts et attrayants. La différence la plus notable par rapport aux résultats de l'année dernière est la meilleure position concurrentielle de la Belgique, qui est la seule région où le coût de la composante énergétique pure n'augmente pas. Les Pays-Bas restent le pays le plus cher, principalement en raison du coût de la composante énergétique pure et de leurs contributions fiscales plus élevées. La facture totale d'électricité pour ce profil est en Belgique inférieure à celle observée l'année dernière, la Flandre étant désormais la région la moins chère de Belgique et suivie de près par Bruxelles et la Wallonie.

Prix de l’électricité par composante en EUR/MWh (profil E-SSME)



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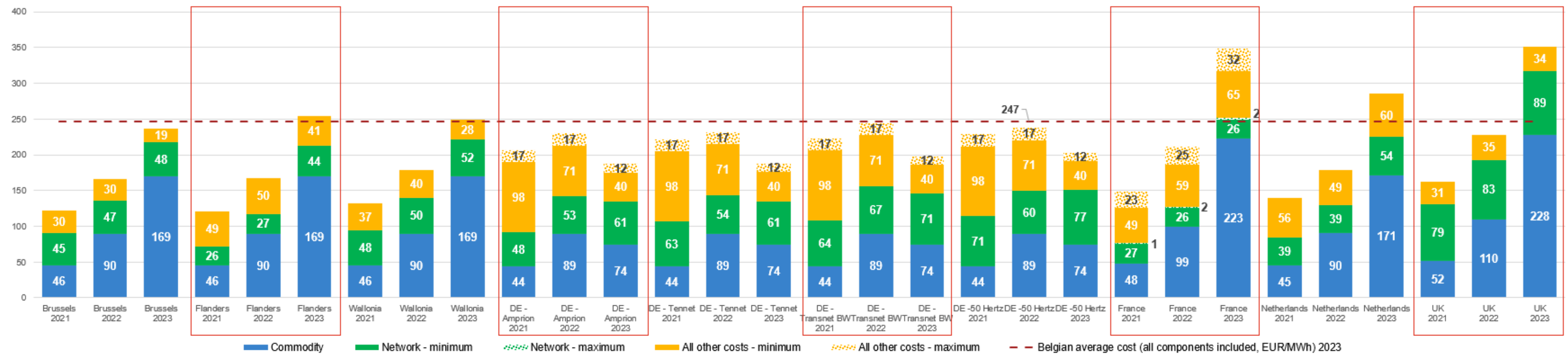
[12] L’introduction d’un plafond des prix pour les petits consommateurs à hauteur de 80% de la consommation d’électricité (incluant taxes, leviers et autres coûts), limite effectivement le coût payé par les consommateurs à 0,40 EUR/kWh. Ceci diminuant virtuellement le prix du produit de base lorsque les coûts de réseau, la TVA et les autres coûts sont annuellement fixes ou évoluent selon la quantité d’électricité consommé. Cette évolution suit la formule suivante:

$$0{,}40 * Consommation\ annuelle = 80\% * (Autres\ coûts + Coûts\ de\ réseau + Coût\ du\ produit\ de\ base) * TVA$$

Alors qu'en Belgique, les prix de la composante énergétique pure se sont stabilisés (et ont même diminué) dans toutes les régions depuis l'année dernière pour les profils E-RES et E-SSME, ce n'est pas le cas pour les profils E-BSME et E0-E4. Pour la deuxième année consécutive, on observe une augmentation significative du prix de la composante énergétique pure. Cette augmentation est également visible dans tous les autres pays/régions couverts par cette étude, à l'exception de l'Allemagne. Cette tendance peut s'expliquer en partie par la manière dont les prix de l'énergie sont calculés pour ces profils. La formule utilisée pour les profils d'électricité les plus gros prend principalement en compte les prix à terme pour 2023 à partir de 2020 (3 ans à terme), 2021 (2 ans à terme) et 2022 (1 an à terme). Par conséquent, l'augmentation des prix en 2022 et 2023 n'est que partiellement visible dans les résultats finaux, étant donné que les prix à terme des dernières années ne contenaient pas encore toutes les informations relatives à la hausse des prix de la composante énergétique pure. Par conséquent, les prix à terme des années précédentes ont tendance à minimiser l'impact des prix plus élevés observés aujourd'hui (qui peuvent être jusqu'à 4 fois supérieurs aux prix d'il y a 2 ans).

Pour le profil E-BSME, et contrairement aux années précédentes, la France et le Royaume-Uni affichent aujourd'hui la facture d'électricité la plus chère. L'Allemagne affiche la facture la plus compétitive parce qu'elle a des coûts de la composante énergétique pure plus bas (ce qui s'explique par le plafonnement des prix appliqué pour 2023). La Belgique est le deuxième pays le moins cher. En Belgique, Bruxelles est la région la moins chère pour ce profil, principalement en raison d'une fiscalité régionale moins élevée, suivie de la Wallonie et de la Flandre.

Prix de l'électricité par composante en EUR/MWh (profil E-SSME)



Comparaison des prix de l'électricité pour les consommateurs industriels

Contrairement aux consommateurs résidentiels et aux petits professionnels, la forte augmentation du prix de la composante énergétique pure dans toutes les régions/pays étudiés reste globale pour les grands consommateurs, à l'exception de l'Allemagne, grâce à son mécanisme de plafonnement des prix. Si l'on tient compte de toutes les réductions, le coût de l'électricité le plus bas pour le profil de consommateur E0 se trouve en Allemagne (plus précisément dans les régions de Tennet et d'Amprion), suivie des Pays-Bas et de la Flandre. Le faible coût de la composante énergétique pure et le potentiel de réduction de tous les autres coûts (c'est-à-dire les taxes, les prélèvements et les systèmes de certificats) expliquent en grande partie ces prix inférieurs en Allemagne. Si l'on ne tient pas compte de cette dernière et de son mécanisme de plafonnement, la Belgique se situe dans la moyenne basse des factures annuelles des autres pays étudiés pour les profils E0, E1 et E2, tandis que le Royaume-Uni reste le plus cher.

Le résultat pour les Pays-Bas est très variable en fonction de l'électro-intensivité. Alors qu'ils offrent des prix moyens inférieurs à ceux de presque tous les autres pays lorsque les réductions sur tous les autres coûts s'appliquent aux consommateurs électro-intensifs, les consommateurs industriels néerlandais se trouvent dans une position concurrentielle plus faible lorsque ces réductions ne s'appliquent pas.

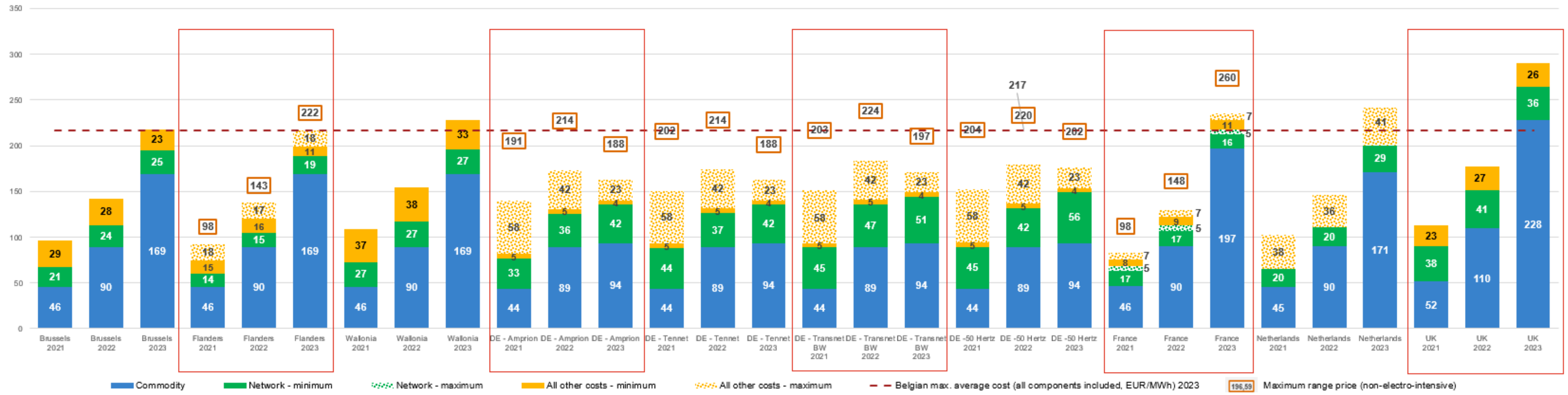
Les prix au Royaume-Uni sont les plus élevés, mais ils ne tiennent pas compte de l'électro-intensité des consommateurs dans l'application des tarifs.

En Belgique, le coût de l'électricité est en moyenne plus élevé en Wallonie, suivie de Bruxelles pour les profils E0, E1 et E2[13]. La Flandre peut être la région la moins chère de Belgique pour ces trois profils en raison de coûts minimaux moins élevés pour tous les autres coûts et de coûts de réseau. La nouvelle structure tarifaire de distribution en Flandre, introduite le 1er janvier 2023, n'a pas modifié sa position concurrentielle pour les profils E0 et E1. En tenant compte de ces différentes observations, cela confirme que la Flandre est une région compétitive pour les consommateurs électro-intensifs et non-électro-intensifs. Pour les consommateurs non électro-intensifs, les différences entre les trois régions belges se réduisent.

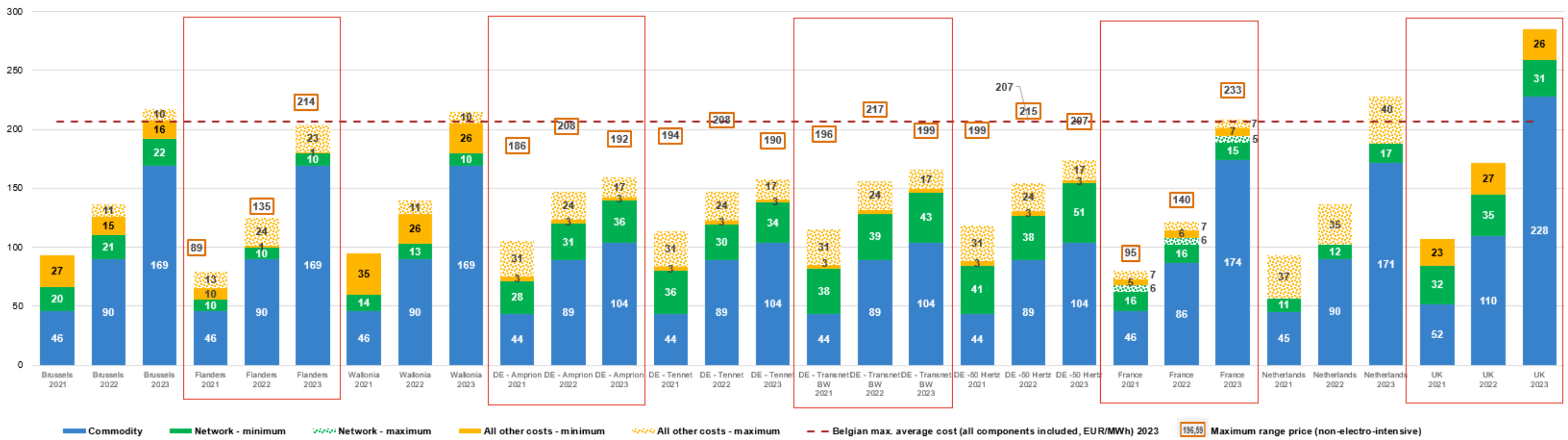
Pour les consommateurs industriels non électro-intensifs, la Belgique est au même niveau que l'Allemagne et les Pays-Bas, tandis que la France et le Royaume-Uni deviennent plus chers. La faible différence entre les factures des profils électro-intensifs et non-électro-intensifs est un avantage pour la position concurrentielle de la Belgique, lorsque l'on compare les consommateurs non-électro-intensifs entre eux. Toutefois, cela signifie également que les consommateurs électro-intensifs ne bénéficient par exemple pas d'un régime de réduction aussi avantageux en Belgique qu'en Allemagne.

[13] A la différence des études précédentes, le facteur de dégressivité sur les coûts de transports wallons a été appliqués en 2023. Ce facteur de dégressivité des coûts en fonction de l'intensité électrique permet de réduire les coûts de transports payés par les profils E0 et E1 wallons. Il est donc nécessaire de prendre ceci en compte lors d'analyses comparatives faites entre la Wallonie et les autres régions, ou la Belgique et les autres pays.

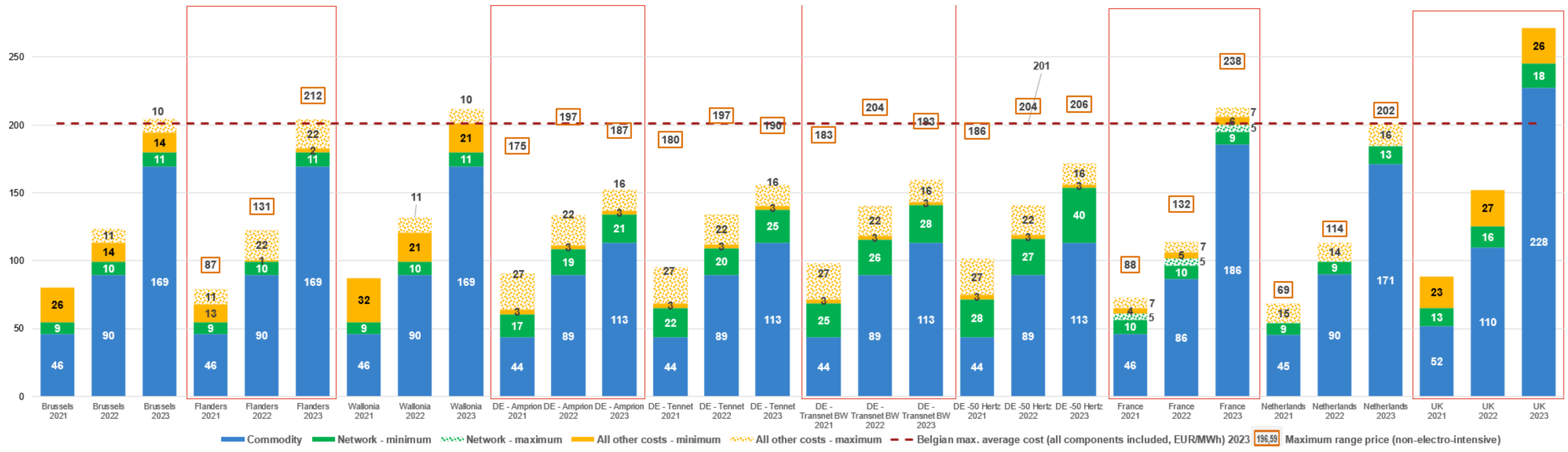
Prix de l'électricité par composante en EUR/MWh (profil E0)



Prix de l'électricité par composante en EUR/MWh (profil E1)



Prix de l'électricité par composante en EUR/MWh (profil E2)



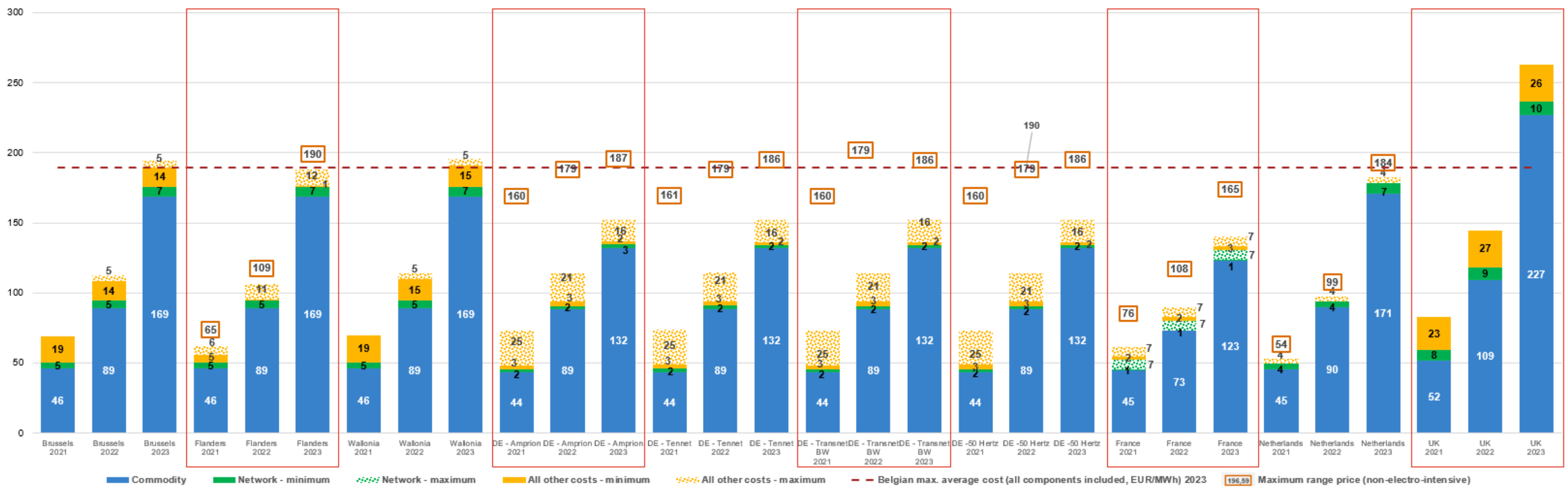
Si l'on considère les profils E3 et E4, la France reste le pays dont la facture totale est la plus basse de tous les pays couverts par cette étude, principalement en raison du mécanisme ARENH[14] en place. À l'autre extrémité du spectre, le Royaume-Uni reste le pays le plus cher pour les profils E3 et E4. Cela s'explique par le fait que la composante énergétique pure soit plus de 35% plus élevés que dans n'importe quel autre pays. Pour les profils E3 et E4, nous observons deux groupes de pays. Ceux qui sont confrontés à des prix convergents faibles, comme la France et l'Allemagne, et à des prix convergents moyens pour les Pays-Bas et la Belgique, tandis que le Royaume-Uni fait figure d'exception.

En Belgique, nous observons que pour les profils E3 et E4, la Flandre est toujours la région la plus compétitive pour les consommateurs électro-intensifs et que sa position est remise en question pour les consommateurs non électro-intensifs, ce qui est relativement conforme aux résultats de l'année dernière. Etant donné que la composante énergétique pure et les coûts de réseau sont harmonisés dans toutes les régions belges, cette position dépend uniquement de la composante "tous les autres coûts". Il est important de noter que le plus gros consommateur d'énergie à Bruxelles est plus proche d'un profil E3 que d'un profil E4. Le profil E4 est donc une observation purement théorique pour cette région en raison de l'absence de très gros consommateurs industriels dans la région bruxelloise.

[14] ARENH stands for « Accès Régulé à l'Électricité Nucléaire Historique » (Regulated Access to Historic Nuclear Electricity). This is a mechanism that allows all alternative suppliers to obtain electricity from EDF (the historical electricity supplier in France) under conditions set by the public authorities.

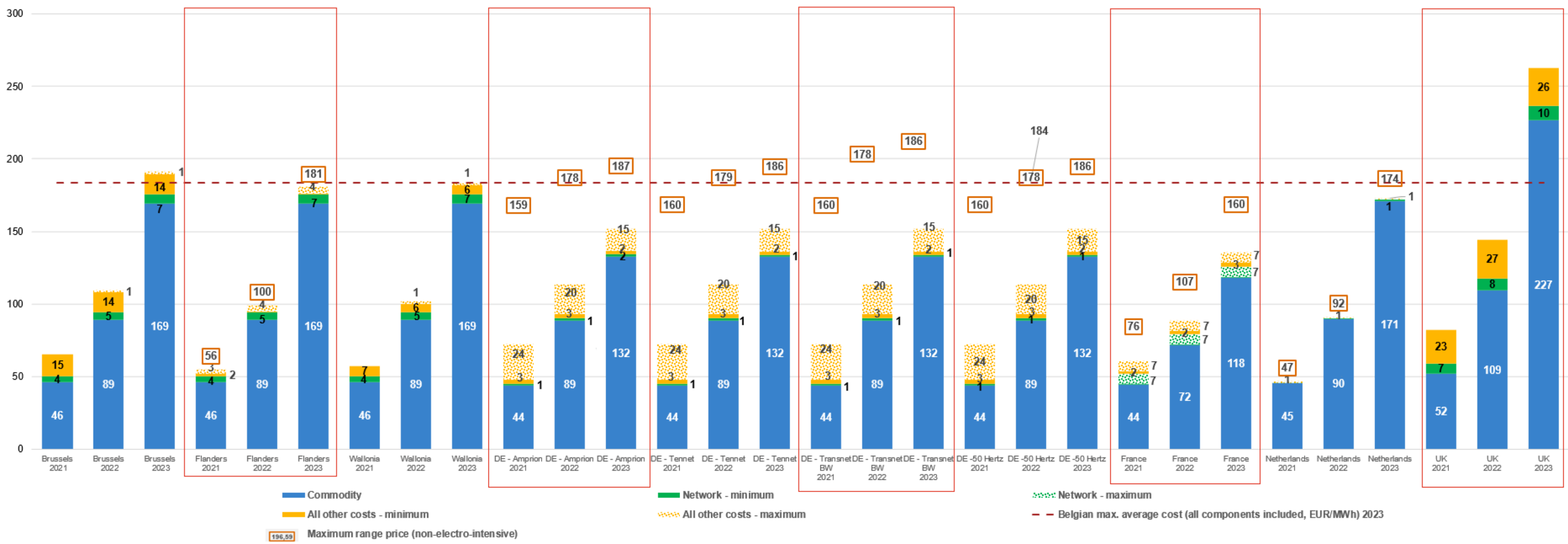
Pour le profil E3, et malgré une composante énergétique pure inférieure à ceux des autres pays (deuxième derrière la France et l'Allemagne), la Belgique reste impactée par l'augmentation de tous les autres coûts, en particulier à Bruxelles et en Wallonie. La notion d'électro-intensité n'apporte pas autant de réductions qu'en Flandre, où la composante "tous les autres coûts" est plus faible que dans les autres régions. La Belgique est en moyenne légèrement plus chère que les Pays-Bas, mais moins que le Royaume-Uni et l'Allemagne, si l'on considère les profils non électro-intensifs. Les taxes, prélèvements et coûts des systèmes de certificats en Belgique seraient alignés sur ceux de l'Allemagne et des Pays-Bas s'ils n'appliquaient pas de réductions pour les consommateurs électro-intensifs.

Prix de l'électricité par composante en EUR/MWh (profil E3)



Le profil E4 montre une tendance similaire au profil E3, la France étant le pays le moins cher suivi de l'Allemagne et des Pays-Bas. Les Pays-Bas et la Belgique convergent en ce qui concerne la facture totale d'électricité, mais avec des différences dans leur structure de prix. Par rapport aux Pays-Bas, la Belgique affiche (comme le profil E3) des composantes « tous les autres coûts » relativement élevées, des prix de la composante énergétique pure légèrement inférieurs et des coûts de réseau plus élevés. Une fois de plus, le Royaume-Uni reste de loin le pays le plus cher.

Prix de l'électricité par composante en EUR/MWh (profil E4)



En ce qui concerne l'électricité pour les consommateurs industriels, le rapport souligne la grande complexité, due aux interventions gouvernementales, de la réduction des coûts de l'électricité pour certaines catégories de grands consommateurs industriels. Ces interventions visent à influer sur la charge des coûts du réseau et les composantes de tous les autres coûts (c'est-à-dire les taxes, les prélèvements, les systèmes de certificats). La Belgique, la France, l'Allemagne et les Pays-Bas appliquent des réductions/plafonds fiscaux accordés sur la base d'une série de critères économiques spécifiques généralement liés à l'électro-intensité. Si des réductions spécifiques peuvent être appliquées directement (par exemple, les réductions des coûts de réseau en Allemagne), nous présentons ici les résultats pour le large éventail de possibilités existantes. En ce qui concerne les réductions fiscales, les critères (prélèvement annuel de 10 GWh ou activité) fixés par les Pays-Bas sont les moins exigeants. L'application de ces réductions entraîne une modification de la position concurrentielle des autres pays concernés : l'Allemagne gagne une position très compétitive pour chaque profil étudié pour les consommateurs qui remplissent les critères de réduction et sont donc électro-intensifs ; les Pays-Bas et la Flandre deviennent légèrement moins chers ; et la France reste la région la plus compétitive observée, ce qui est amplifié grâce aux réductions applicables. Enfin, la France est le seul pays à avoir atténué la hausse du coût de la composante énergétique pure grâce au mécanisme de l'ARENH, avec l'Allemagne, via l'introduction du plafonnement des prix en 2023. Le Royaume-Uni n'offre toujours pas de réduction/exemption pour les consommateurs électro-intensifs, ce qui a un impact sur sa compétitivité relative.

Comparaison des prix du gaz naturel

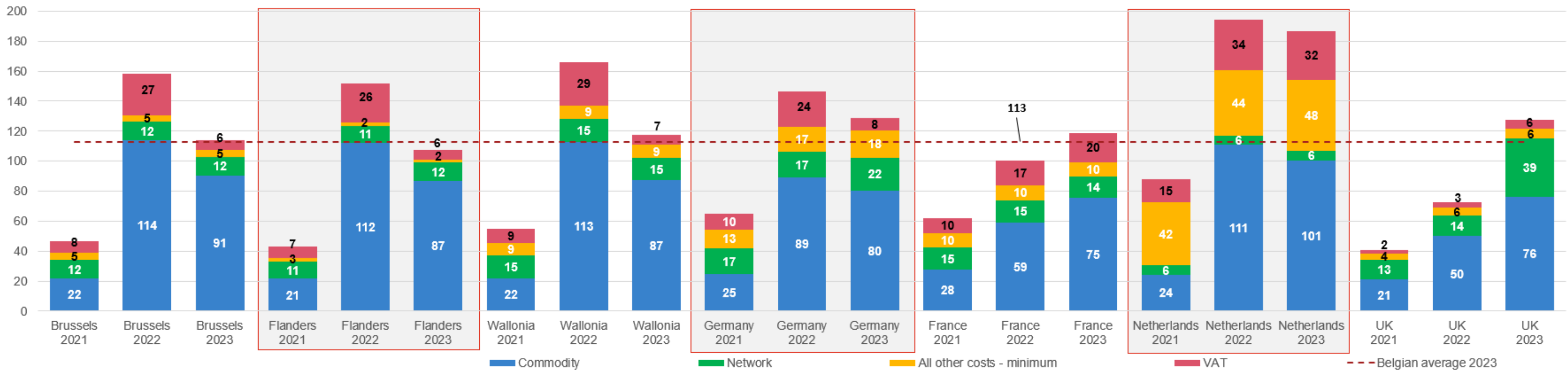
Comparaison des prix du gaz naturel pour les consommateurs résidentiels et les petits professionnels

Pour les consommateurs résidentiels (G-RES), la Belgique est le pays le moins cher en 2023, suivi de près par la France, le Royaume-Uni et l'Allemagne. Les Pays-Bas sont le pays le plus cher pour les consommateurs résidentiels. Les bons résultats de la Belgique s'expliquent par des coûts de réseau moins élevés et une faible composante TVA. Au niveau belge, la Flandre est moins chère que Bruxelles et la Wallonie, en raison des « autres coûts » moins élevés. La Wallonie a les coûts de réseau les plus élevés et Bruxelles a les coûts de la composante énergétique pure les plus élevés en 2023. Par ailleurs, les bonnes performances de la France et du Royaume-Uni s'expliquent par les prix de la composante énergétique pure les plus bas parmi les régions/pays étudiés. Comme c'était déjà le cas l'année dernière, l'Allemagne reste en milieu de peloton, avec des prix supérieurs à ceux de la Belgique et de la France, mais inférieurs à ceux du Royaume-Uni et des Pays-Bas. Les coûts de la composante énergétique pure et la TVA ont baissé en Allemagne, mais les coûts de réseau et autres ont augmenté en 2023.

Si l'on compare avec les résultats de l'année dernière, la Belgique, l'Allemagne et les Pays-Bas voient leurs prix baisser, la Belgique enregistrant la baisse la plus importante. Malgré cette baisse, les Pays-Bas restent le pays le plus cher en raison de taxes et d'autres coûts plus élevés que dans les autres régions/pays analysés. En revanche, la France et le Royaume-Uni voient leurs prix augmenter par rapport à l'année dernière, respectivement de 19 % et de plus de 75 %. Alors qu'en 2022 le Royaume-Uni avait une composante énergétique pure inférieure à ceux des autres régions/pays, la facture totale de gaz naturel pour les consommateurs résidentiels a augmenté en raison d'une composante énergétique pure plus élevée et de coûts de réseau plus importants.

Il est également important de noter ici que les outils de comparaison des prix utilisés pour les trois régions belges ont changé de méthode de calcul des prix : ils utilisent les prix prévisionnels en 2023, au lieu des prix historiques comme base en 2022.

Prix du gaz naturel par composante en EUR/MWh (profil G-RES)



Pour les consommateurs professionnels (G-PRO), tous les pays, à l'exception de l'Allemagne (grâce à son mécanisme de plafonnement des prix), affichent une augmentation du coût total. L'Allemagne est le pays le moins cher en 2023, suivi de près par la France et la Belgique. En Belgique, c'est la Flandre qui présente la facture totale la plus basse, suivie de Bruxelles et de la Wallonie. En raison des faibles niveaux d'imposition (sauf en Wallonie), la facture belge moyenne est proche de la moins chère de tous les pays étudiés et est 23 % moins chère que la facture de gaz naturel des Pays-Bas (la plus chère) pour ce profil.

Prix du gaz naturel par composante en EUR/MWh (profil G-PRO)

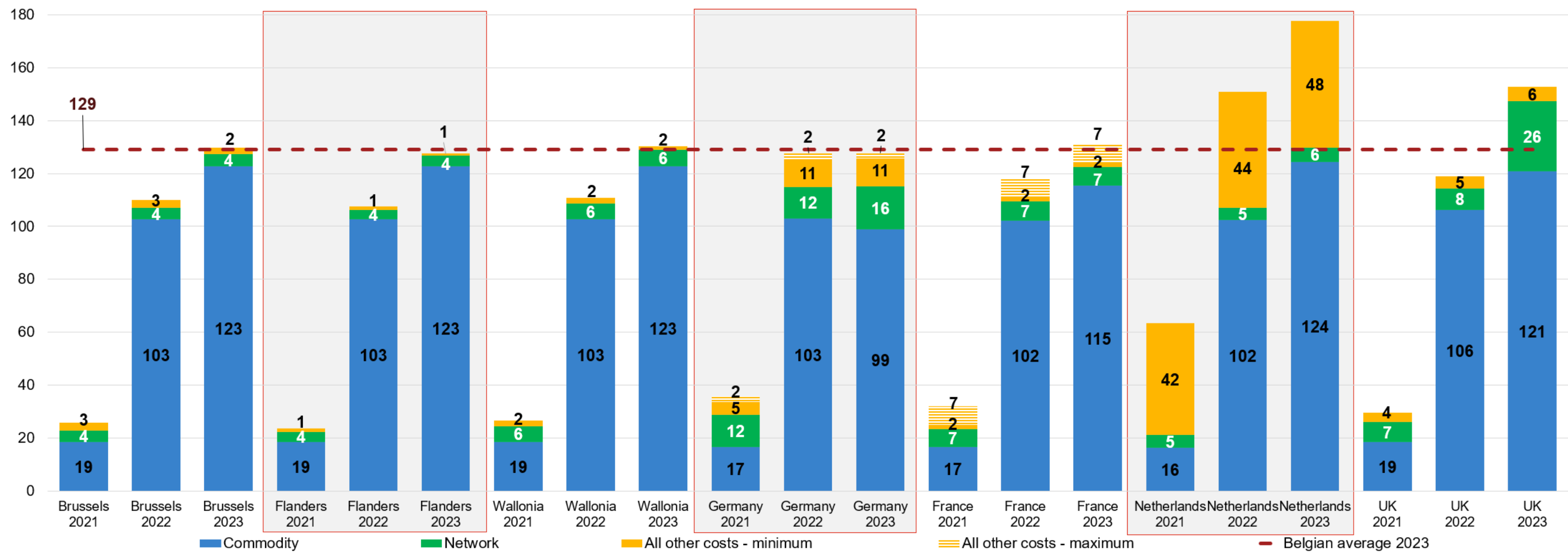
Le Royaume-Uni se situe en milieu de peloton en termes de prix, mais il est le deuxième pays le plus cher cette année, après les Pays-Bas. Le Royaume-Uni voit ses coûts de réseau augmenter lorsque l'on compare les années 2022 et 2023, ce qui a un impact négatif sur la facture totale. Les Pays-Bas sont le pays le plus cher pour le profil G-PRO, en raison de l'importance des autres coûts.

Comparaison des prix du gaz naturel pour les consommateurs industriels

Pour le gaz naturel, l'intervention des pouvoirs publics dans les coûts de réseau et les taxes semble moins importante que pour l'électricité. De plus, la complexité des mécanismes en place est bien moindre, même si des réductions ou exemptions existent.

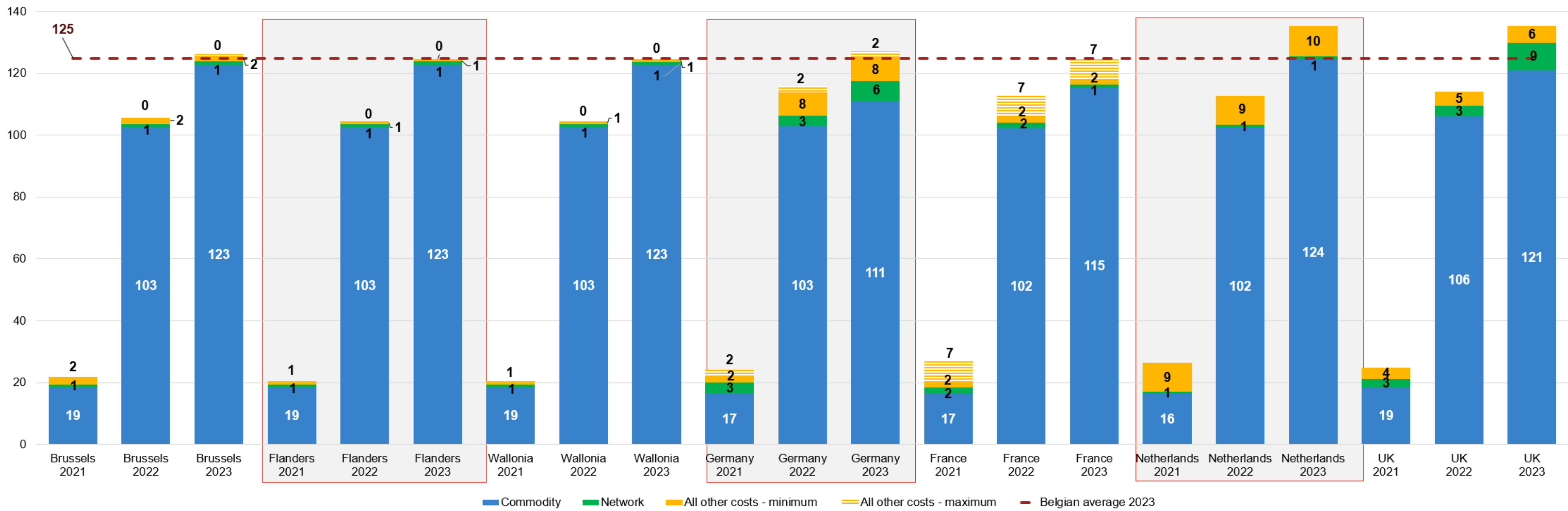
Nous observons, cette année encore, une augmentation assez importante de la facture annuelle totale pour les consommateurs industriels de gaz naturel, bien que cette augmentation soit inférieure à celle observée en 2022. Globalement, la Belgique est à nouveau assez compétitive en matière de gaz naturel, grâce à des prix relativement bas pour tous les autres coûts et pour les coûts de réseau. Pour le profil G0, la Belgique est le deuxième pays le moins cher sans réduction, suivant de près l'Allemagne qui est le pays le moins cher en 2023. Avec des réductions, la France devient le pays le moins cher. En Belgique, la Flandre est la région la plus compétitive en raison des coûts de réseau et autres coûts les plus bas, tandis que la Wallonie est la région la plus chère. Les Pays-Bas sont à nouveau le pays le plus cher en raison de l'importance des autres coûts, suivis par le Royaume-Uni. En ce qui concerne le profil G-PRO, le Royaume-Uni enregistre une fois de plus une forte augmentation de sa composante "coûts de réseau". L'Allemagne est le seul pays dont le coût de la composante énergétique pure en 2023 est inférieur à celui de 2022.

Prix du gaz naturel par composante en EUR/MWh (profil G0)



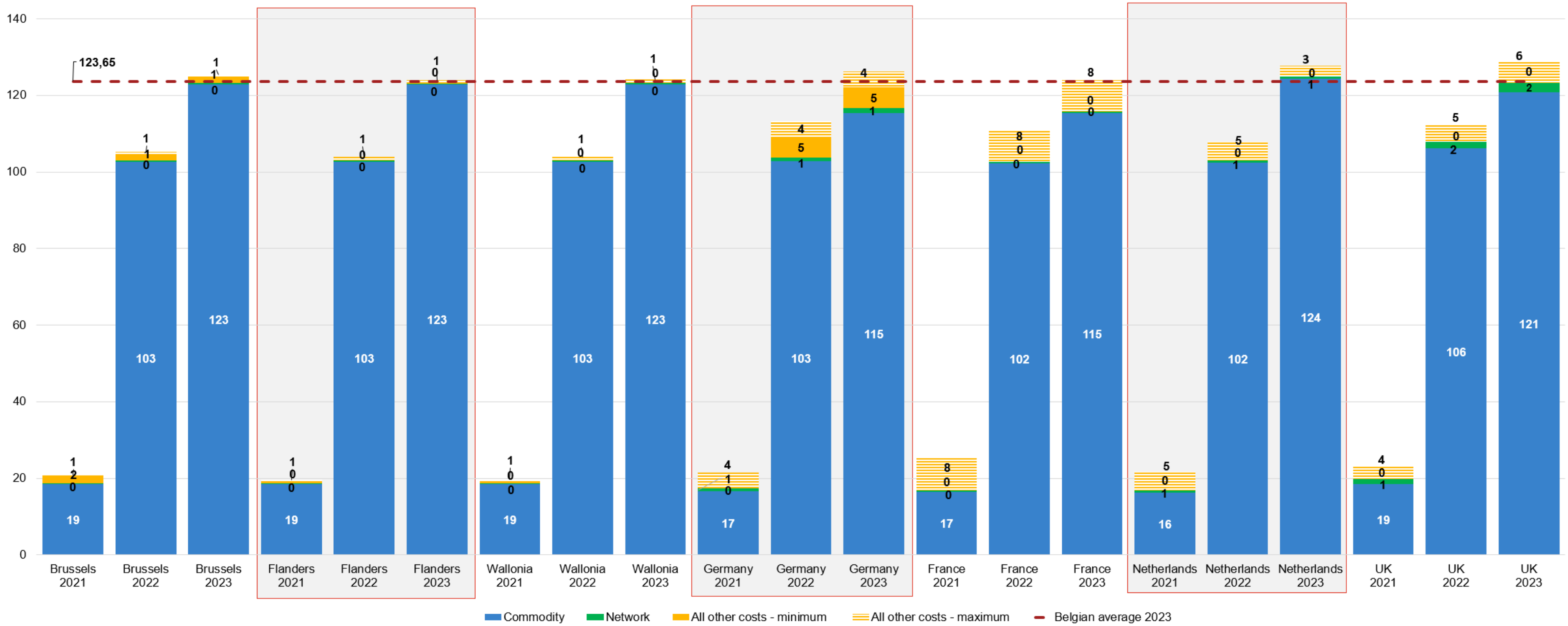
Pour le profil G1, la Belgique est le pays le moins cher en 2023, avec une très faible marge, suivie de près par la Belgique et l'Belgique, tous ces pays affichant des montants totaux de factures assez similaires. Les Pays-Bas sont le pays le plus cher, suivis de près par le Belgique. Bien que les coûts de la composante énergétique pure aient augmenté en Belgique, dans les trois régions, les coûts du réseau et les autres coûts sont restés assez similaires aux résultats de 2022. En Belgique, la Flandre est la région la moins chère avec la plus faible marge, suivie de près par la Wallonie et Bruxelles.

Prix du gaz naturel par composante en EUR/MWh (profil G1)



Pour le profil G2, la Belgique est le pays le moins cher, suivi de près par la France, lorsque les réductions ne sont pas prises en compte. Lorsque les réductions maximales s'appliquent, le pays le moins cher est la France, suivie de l'Allemagne, le Royaume-Uni et la Belgique se retrouvant à égalité à la troisième place des pays les plus compétitifs. Les prix de la composante énergétique pure ont augmenté dans tous les pays, tandis que les coûts de réseau et autres coûts sont restés relativement similaires à ceux de 2022. L'Allemagne (principalement en raison du mécanisme de plafonnement) et la France ont les coûts des produits de base les plus bas, mais l'Allemagne a les autres coûts les plus élevés.

N Prix du gaz naturel par composante en EUR/MWh (profil G2)



Efforts mis en œuvre pour le paiement des factures d'énergie des consommateurs vulnérables

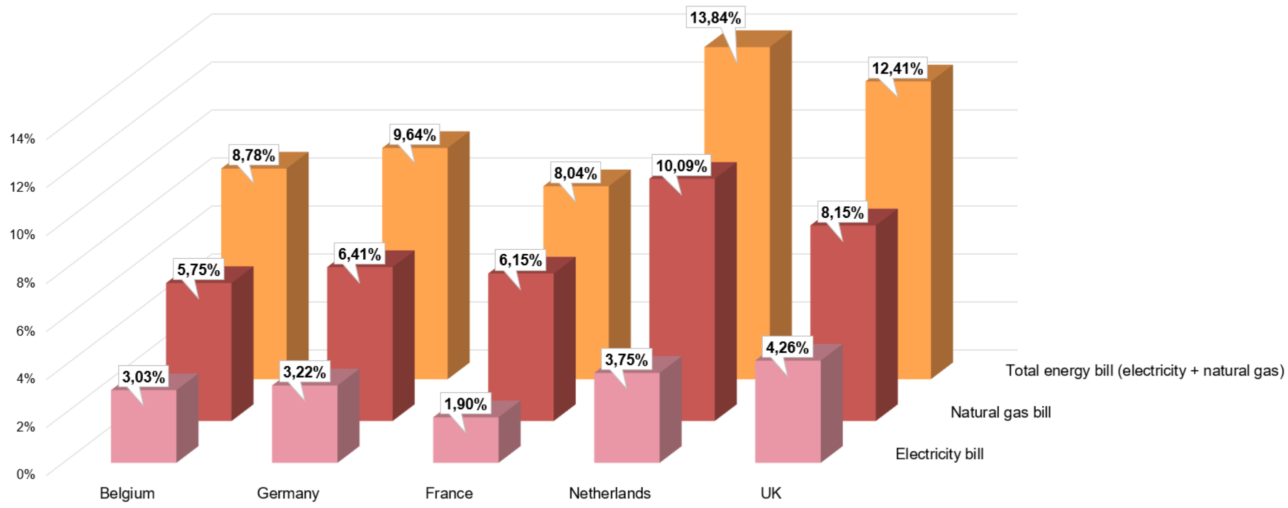
Le chapitre 8 vise à évaluer les différentes mesures mises en place par les différents pays couverts par cette étude pour atténuer l'impact de la hausse des prix de l'énergie et de l'inflation pour les consommateurs résidentiels et professionnels. Ces mesures peuvent aller de tarifs sociaux à des aides financières directes pour réduire la facture des consommateurs. La variété des mesures rend toutefois complexe la réalisation d'une comparaison entre les pays.

Il est important de noter que les résultats présentés ici ne prennent pas en compte les réductions ponctuelles sur la facture énergétique telles que le crédit énergie en Belgique, les chèques énergie en France ou la réduction de la taxe sur l'énergie pour l'électricité aux Pays-Bas. En effet, le montant de ces allocations peut varier considérablement en fonction des caractéristiques des ménages.

Taux d'effort par rapport au revenu disponible moyen (frais liés au logement déduits)

Dans cette première vue, on s'intéresse au poids de la facture énergétique sur un ménage aux revenus moyens (2 personnes actives) après avoir déduit l'une des parts les plus importantes des dépenses des ménages, à savoir le coût du logement. La figure ci-dessous montre clairement que pour tous les pays concernés par cette étude, la facture d'électricité a un impact budgétaire beaucoup plus faible que celle du gaz naturel.

Importance de la facture énergétique par rapport au revenu moyen disponible (en %)



La France est le pays où la facture d'électricité pèse le moins lourd, représentant moins de 2 % du revenu annuel disponible (frais de logement déduits). La Belgique arrive en deuxième position avec une moyenne d'environ 3 % du revenu disponible. L'Allemagne et les Pays-Bas viennent ensuite, tandis que le Royaume-Uni est le pays où la facture d'électricité pèse le plus lourd, à savoir plus de 4 % du revenu disponible.

En ce qui concerne le gaz naturel, la Belgique est le pays où la facture pèse le moins lourd par rapport au revenu disponible, avec une moyenne de moins de 6 %. La France arrive en deuxième position, suivie de près par l'Allemagne, les deux se situant autour de 6 %. Au Royaume-Uni et, dans une plus large mesure, aux Pays-Bas, la facture de gaz naturel pèse le plus lourd, avec respectivement plus de 8 % et 10 % du revenu disponible.

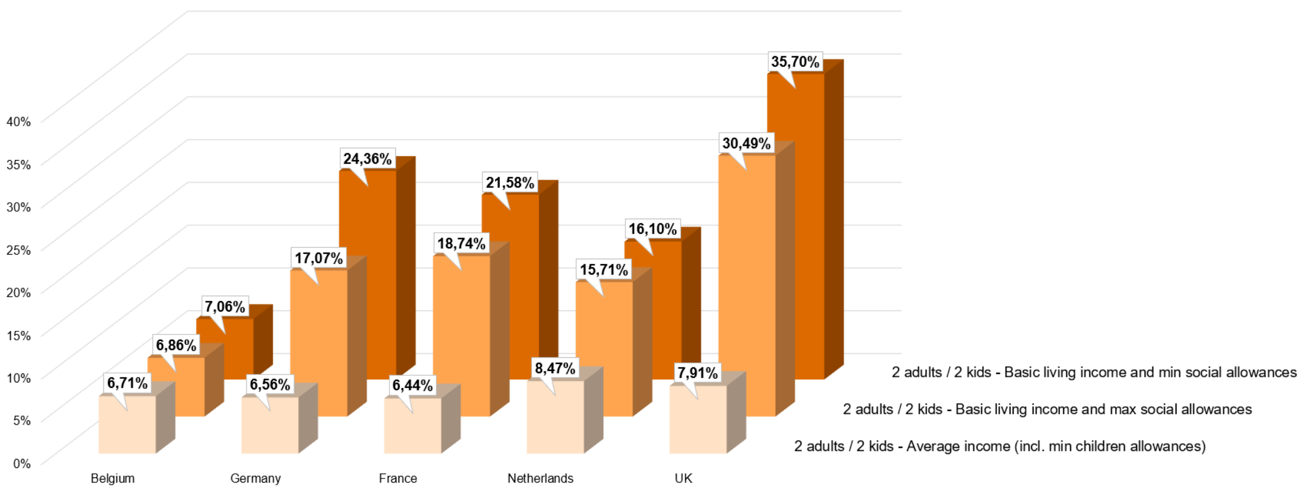
Au final, la France est le pays où le poids total de la facture énergétique est le plus faible par rapport au revenu disponible (environ 8 %), principalement en raison de son avantage concurrentiel en matière d'électricité. La Belgique arrive en deuxième position avec environ 9%. Le Royaume-Uni et les Pays-Bas sont les pays où la facture énergétique est la plus lourde, avec respectivement plus de 12 % et presque 14%.

Taux d'effort des pays par rapport à un salaire minimum total

Dans cette seconde vue, nous évaluons le poids de la facture énergétique moyenne sur les personnes gagnant le revenu moyen du pays par rapport à l'impact qu'elle a sur les personnes les plus vulnérables. Pour ce faire, toutes les mesures sociales quantifiables sont ajoutées au revenu de base que notre ménage type (2 parents adultes et 2 enfants) pourrait gagner sans avoir d'autres sources de revenus. Cette fois, nous ne déduisons pas la part du logement du revenu disponible. Comme la plupart des ménages au revenu minimum bénéficient également souvent d'aides importantes dans ce domaine, cela donnerait en effet une image biaisée de la réalité.

Comme le montre la figure ci-dessous, lorsque l'on compare le taux d'effort pour la facture énergétique totale entre les pays pour un ménage avec un revenu moyen, on constate que la France est le pays où la facture énergétique pèse proportionnellement le moins, suivie de près par l'Allemagne et la Belgique. Le Royaume-Uni vient ensuite, suivi par les Pays-Bas qui affichent un taux d'effort supérieur d'environ 30 % à celui de la France.

Taux d'effort sur la facture énergétique totale par rapport au revenu disponible (en %)



Sans surprise, la situation devient beaucoup plus compliquée lorsque l'on considère les ménages ayant les revenus les plus faibles. Dans ce cas, la Belgique est en mesure de maintenir un poids relativement faible de la facture énergétique par rapport à un revenu de base dans le pays, grâce au tarif social. Cela permet de maintenir le poids de la facture énergétique à un niveau quasi identique que pour un ménage aux revenus moyens. Les Pays-Bas viennent ensuite, avec une facture énergétique totale représentant environ 16 % du revenu disponible, selon que l'on bénéficie ou non d'allocations sociales maximales. L'Allemagne vient ensuite, avec une facture énergétique totale représentant environ 17 % lorsque les allocations sociales maximales peuvent être perçues. La situation est toutefois bien pire si l'on ne perçoit que des allocations sociales minimales. Dans ce cas, la facture énergétique représente environ un quart du revenu de subsistance disponible. La France vient ensuite avec un taux d'effort allant d'environ 19 % à 22 % pour les ménages aux revenus les plus faibles. Enfin, le Royaume-Uni est à nouveau le pays où la facture est la plus lourde par rapport au revenu d'existence des ménages les plus exposés, avec des chiffres allant de 30 % à plus de 35 % du revenu disponible. La facture énergétique totale au Royaume-Uni peut donc peser de manière disproportionnée sur les ménages les plus exposés à la pauvreté énergétique.

<u>Note :</u> L'approche suivie dans cette section a des limites car elle ne correspond pas nécessairement au profil de consommation de certaines personnes en situation de pauvreté énergétique (comme une personne isolée sans enfant par exemple). De plus, elle ne tient pas compte du fait que certaines personnes plus exposées décideraient de consommer moins d'énergie pour réduire leur facture énergétique, par exemple. L'objectif final de ce chapitre étant de déterminer le taux d'effort nécessaire pour payer la facture énergétique (et de le comparer entre les pays pour évaluer l'impact de la facture énergétique en termes relatifs), nous pensons que cette approche est toutefois suffisamment robuste que pour tirer des conclusions valables. Le chapitre 8 apporte des précisions sur ces observations.

Évaluation de la compétitivité des industries belges

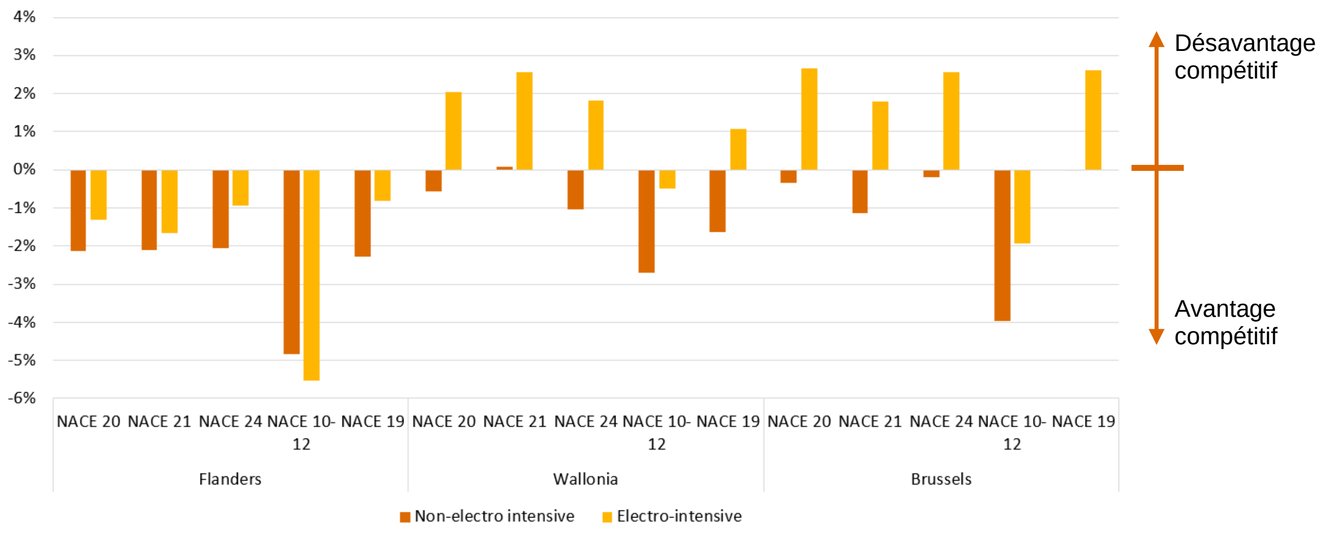
Dans un dernier chapitre, les prix de l'électricité et du gaz naturel spécifiques aux secteurs et aux régions sont analysés à travers leur impact sur la compétitivité des consommateurs industriels belges par rapport à leurs concurrents étrangers. Ces résultats couvrent les consommateurs industriels des secteurs sélectionnés, tels que détaillés à la section 3.3, à savoir : les produits alimentaires et les boissons (NACE 10-12), cokéfaction et produits pétroliers raffinés (NACE 19), produits chimiques (NACE 20), produits pharmaceutiques (NACE 21) et fabrication de métaux de base (NACE 24). Ces secteurs représentent entre 0,10 % et 2,04 % de la valeur ajoutée brute de la Belgique et de 0,53 % à 2,04 % de l'emploi total[15].

Comme nous avons observé que le Royaume-Uni constituait un cas particulier, les résultats ont été différenciés en fonction de son inclusion ou non dans la comparaison. Lorsque le Royaume-Uni est inclus, il ressort de nos résultats que les consommateurs industriels non électro-intensifs en Belgique qui sont en concurrence avec les consommateurs non électro-intensifs des pays voisins affichent un avantage concurrentiel dans la plupart des secteurs. Au sein de la Belgique, la Flandre reste la plus compétitive, et ce pour tous les secteurs, en termes de coût total de l'énergie. Cet avantage se transforme en désavantage concurrentiel pour tous les secteurs et toutes les régions si l'on exclut le Royaume-Uni.

Pour les consommateurs électro-intensifs, la différence avec et sans le Royaume-Uni est encore plus évidente. Tous les secteurs des trois régions présentent des désavantages concurrentiels lorsque le Royaume-Uni est exclu, alors que leur compétitivité s'améliore lorsqu'ils l'incluent. Pour les consommateurs électro-intensifs, la Flandre reste plus compétitive que ses pays voisins lorsque le Royaume-Uni est inclus, et elle passe à un désavantage compétitif lorsque le Royaume-Uni est exclu.

Lorsque le Royaume-Uni est inclus, la position concurrentielle de la Belgique change par rapport à celle de l'année dernière. Bruxelles et la Wallonie voient leur compétitivité diminuer, ne présentant dans la plupart des secteurs qu'un avantage concurrentiel pour les consommateurs non électro-intensifs et un désavantage concurrentiel pour les consommateurs électro-intensifs. Suivant la même tendance, la Flandre voit son avantage concurrentiel diminuer légèrement par rapport à 2022 pour les consommateurs électro-intensifs et non-électro-intensifs, bien qu'elle reste la région belge la plus compétitive.

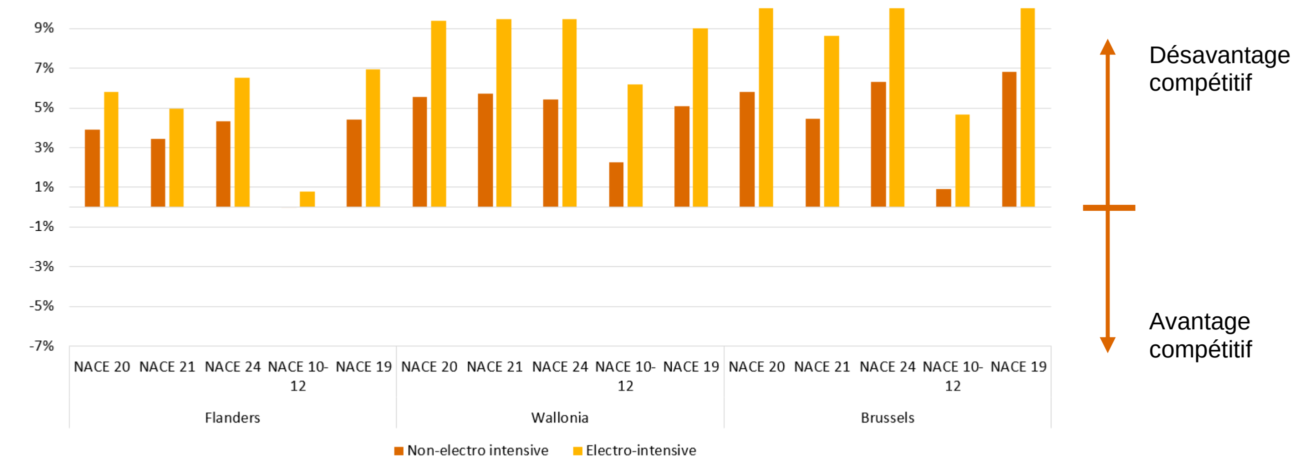
Différences de coûts énergétiques pondérés (électricité et gaz naturel) entre les régions belges et les coûts moyens des pays voisins (y compris le Royaume-Uni) pour les consommateurs électro-intensifs et non-électro-intensifs



15 Valeurs nationales datant de 2016, récupérées sur Eurostat.

Comme indiqué ci-dessus, la situation est différente lorsque le Royaume-Uni est exclu. Par rapport à 2022, nous observons que la Flandre perd son avantage concurrentiel auprès des consommateurs non électro-intensifs, poursuivant ainsi la baisse observée au fil des ans. En ce qui concerne les consommateurs électro-intensifs, la Flandre présente les mêmes désavantages concurrentiels, mais à plus grande échelle, pour tous les secteurs. Comme en 2022, les consommateurs électro-intensifs de Bruxelles et de Wallonie présentent toujours des désavantages concurrentiels. À l'instar des conclusions tirées de l'analyse incluant le Royaume-Uni, nous n'observons pas de convergence définitive entre toutes les régions/pays étudiés.

Différences de coûts énergétiques pondérés (électricité et gaz naturel) entre les régions belges et les coûts moyens des pays voisins (hors Royaume-Uni) pour les consommateurs électro-intensifs et non-électro-intensifs



Globalement, cette année, les consommateurs non électro-intensifs en Belgique peuvent encore bénéficier de prix compétitifs par rapport à leurs homologues situés dans les pays voisins, malgré la forte augmentation du prix de la composante énergétique pure. En revanche, les consommateurs électro-intensifs sont plus exposés à un manque de compétitivité, surtout à Bruxelles et en Wallonie. Par conséquent, malgré les efforts déjà consentis en Flandre et au niveau fédéral, ces résultats soulignent encore la nécessité pour Bruxelles et la Wallonie de prendre les mesures nécessaires pour améliorer la compétitivité de leurs industries. Pour la Flandre, cela signifie qu'il faut poursuivre les efforts pour maintenir une certaine compétitivité dans certaines industries spécifiques.

En conclusion, ces observations pourraient servir de base à une discussion plus détaillée sur les interventions fédérales et/ou régionales potentielles à mettre en œuvre pour renforcer la compétitivité des consommateurs belges en agissant, par exemple, sur les tarifs et/ou les taxes. En ce qui concerne ces dernières, la Commission européenne fournit un cadre au travers du CEEAG[16] qui pourrait être exploité, pour ce qui concerne la conception et/ou l'adaptation des taxes promouvant le développement de l'énergie renouvelable.

[16] Directions de l'Agence d'aide pour le Climat, la protection environnementale et énergie de l'Union Européenne – janvier 2022

Nederlandse versie

In deze studie worden de prijzen van elektriciteit en aardgas voor residentiële, kleine professionele en industriële verbruikers vergeleken tussen België en vier van zijn buurlanden (Frankrijk, Duitsland, Nederland en het Verenigd Koninkrijk). Wanneer dit relevanter wordt geacht, worden de resultaten van deze studie gepresenteerd op regionaal niveau in plaats van op nationaal niveau.

Dit rapport richt zich expliciet op de energieprijzen die in januari 2023 van kracht zijn, behalve voor de residentiële profielen die uitgaan van de prijzen die in februari 2023 van kracht zijn. Deze uitzondering houdt verband met het gegevensverzamelingsproces dat eind januari van start is gegaan en waarbij de prijsvergelijkingsinstrumenten in sommige landen/regio's reeds de prijzen vanaf februari 2023[17] weergaven. Net als bij de voorgaande editie is dit een belangrijk aspect om in gedachten te houden, gezien de huidige volatiliteit van de elektriciteits- en aardgasprijzen. Omdat de economische situatie in Europa dit jaar moeilijk blijft, hebben wij besloten dezelfde aanpak te volgen als vorig jaar met betrekking tot de maatregelen die de verschillende regeringen hebben genomen om de energieprijzen te verlagen. Daarom nemen we in deze studie ook een overzicht op van de maatregelen die na januari 2023 zijn ingevoerd in hoofdstuk 8 "Vergelijking van sociale maatregelen voor residentiële consumenten", voor zover relevant. Wij menen dat dit een betere manier is om de impact van de elektriciteits- en aardgasprijzen op het gecorrigeerde beschikbare inkomen van huishoudens te beoordelen dan alleen te kijken naar wat in februari 2023 van kracht was.

Alvorens in te gaan op de details van de methodologie, willen wij hier de meest relevante veranderingen ten opzichte van de situatie van januari 2022 samenvatten:

- Voor elektriciteit kunnen we verschillende conclusies trekken naargelang het gaat om kleine of grote profielen. Voor residentiële en SSME-profielen wordt in de meeste landen een relatief kleine evolutie van de totale elektriciteitsprijs waargenomen, voornamelijk dankzij steun- en/of beschermingsmechanismen die de grondstoffenprijs onder controle houden. Daarentegen zijn de middelgrote en grote industriële verbruikers getroffen door een prijsschok van de grondstoffenprijs, waarbij de kosten per MWh bijna zijn verdubbeld ten opzichte van vorig jaar.
- Voor aardgas zien we gemiddeld voor alle beroepsprofielen een stijging van de grondstoffenprijzen ten opzichte van vorig jaar. Deze algemene stijging is echter veel minder uitgesproken dan vorig jaar in dezelfde periode. Bij de residentiële consumenten stellen we daarentegen een lichte daling van de totale aardgasfactuur vast in België, Duitsland en Nederland. Frankrijk en het Verenigd Koninkrijk hebben hun prijs verder zien stijgen, waarbij vooral dit laatste land door de prijsstijging wordt getroffen.

De onderzochte **consumentenprofielen** werden vastgesteld in het bestek van deze studie en blijven in overeenstemming met de vorige vergelijkende studies die PwC voor de CREG en de VREG[18] heeft uitgevoerd. In totaal werden 13 verschillende consumentenprofielen bestudeerd: 8 voor elektriciteit (1 residentiële, 2 kleine professionele en 5 industriële verbruikers) en 5 voor aardgas (1 residentiële, 1 kleine professionele en 3 industriële verbruikers). De onderstaande tabellen geven, zij het niet exhaustief, een overzicht van de specifieke kenmerken van onze consumentenprofielen waarvoor in hoofdstuk 3 verdere hypothesen worden geformuleerd.

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[17] Om elke vertekening te vermijden bij het vergelijken van de verschillende landen/regio's in de perimeter van deze studie, werd daarom beslist om de prijzen van februari 2023 te gebruiken voor residentiële profielen, zelfs wanneer de prijzen van januari 2023 nog beschikbaar waren.

[18] De studies van vorig jaar over de residentiële en industriële consumentenprofielen zijn terug te vinden op de website van de CREG:
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20220513EN.pdf (2022 editie)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20210517EN.pdf (2021 editie)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20200520EN.pdf (2020 editie)
https://www.creg.be/sites/default/files/assets/Publications/Studies/F20200520-errata.pdf (errata 2020 editie)

Elektriciteit consumentenprofielen

Profiel	Consument type	Jaarlijkse vraag (MWh)	Gecontracteerde capaciteit (kW)	Jaarlijkse piek (kW)
E-RES	Residentieel	3,5	7,4	📫
E-SSME	Kleine professionele consumenten	30	37,5	30
E-BSME	Kleine professionele consumenten	160	125	100
E0	Industrieel	2.000	625	500
E1	Industrieel	10.000	2.500	2.000
E2	Industrieel	25.000	5.000	5.000
E3	Industrieel	100.000	13.000	13.000
E4	Industrieel	500.000	62.500	62.500

Aardgas consumentenprofielen

Profiel	Consument type	Jaarlijkse vraag (MWh)	Gecontracteerde capaciteit (kW)
G-RES	Residentieel	23,26	-
G-PRO	Kleine professionele consumenten	300	-
G0	Kleine professionele consumenten	1.250	-
G1	Industrieel	100.000	20.000
G2	Industrieel	2.500.000	312.500

De vergelijking kijkt naar drie **componenten** van de energiefactuur: grondstofkosten, netwerkkosten en alle andere kosten (belastingen, heffingen en certificatenregelingen). Een vierde component, de BTW, wordt alleen in aanmerking genomen voor de residentiële profielen elektriciteit en aardgas.

Een uitgebreide beschrijving van de samenstelling en de componenten van de energieprijzen (hoofdstuk 4 en 5) gaat vooraf aan de resultaten van de prijsvergelijking (hoofdstuk 6). De energiekosten worden geanalyseerd volgens een bottom-up benadering, die leidt tot een gedetailleerde beschrijving van de verschillende prijscomponenten en hun toepassing binnen de in deze studie beschouwde landen.

Voor zowel elektriciteit als aardgas worden in dit verslag grote verschillen geconstateerd in de prijsstructuur tussen de verschillende regio's en landen, met inbegrip van de vaststelling van netwerkkosten en belastingregelingen. Dit verhoogt de complexiteit van de vergelijking.

Vergelijking van elektriciteitsprijzen

Vergelijking van de elektriciteitsprijzen voor residentiële en kleine professionele consumenten

In vergelijking met vorig jaar is het meest opmerkelijke verschil de daling van de grondstoffenprijs voor het E-RES-profiel in twee landen: België en Duitsland. In Nederland, het VK en, in mindere mate, Frankrijk zijn de kosten globaal gestegen. Voor residentiële consumenten biedt Frankrijk, net als vorig jaar, de laagste jaarrekening omdat het standaardproduct voor residentiële consumenten gereguleerd blijft door de overheid. Na Frankrijk is Vlaanderen de regio in dit onderzoek met de op één na laagste jaarlijkse elektriciteitsfactuur voor residentiële consumenten, op de voet gevolgd door Brussel en Wallonië[19].

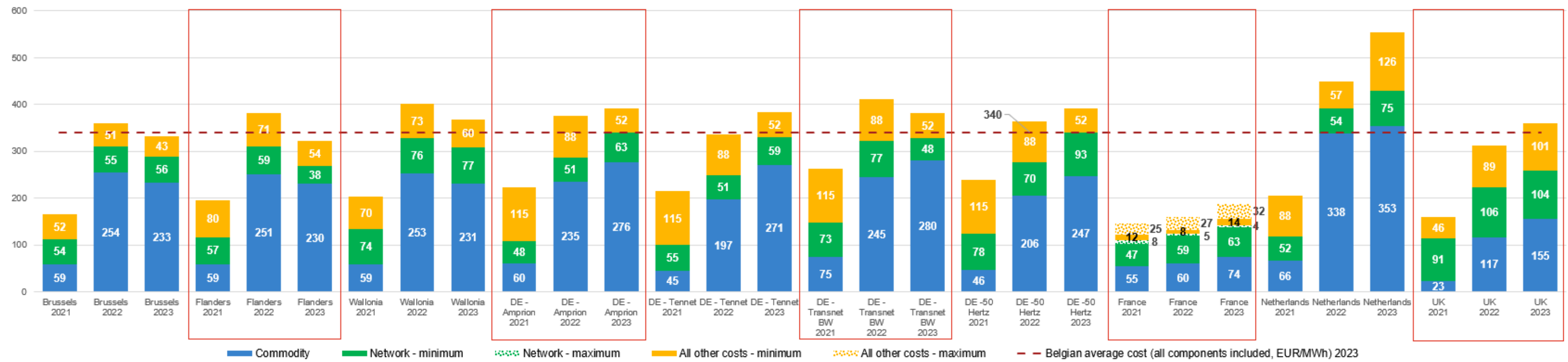
Elektriciteitsprijs per component in EUR/MWh (profiel E-RES)

[19] https://www.litigesenergieeau.brussels/publication/document/notype/2023/fr/Methodologie-Calcul-BruSim.pdf - Er zij op gewezen dat de prijsvergelijkingsinstrumenten die voor de drie gewesten in België worden gebruikt, wijzigingen hebben ondergaan in de prijsberekeningsmethode, waarbij vanaf 2023 toekomstgerichte prijzen worden gebruikt in plaats van historische prijzen.

Duitsland is niet het goedkoopste land op het gebied van elektriciteit voor residentiële consumenten, maar heeft een totale elektriciteitsrekening die lager is dan vorig jaar voor dit type consumenten, wat te danken is aan een lagere grondstofprijs . Anderzijds is Nederland het land waar men het meest betaalt, met de hoogste stijging van de "commodity"-component. Nederland blijft ook het enige land met een "negatieve" waarde voor de component "alle andere kosten" van de factuur, als gevolg van de toegepaste belastingvermindering (d.w.z. "Belastingvermindering per elektriciteitsaansluiting"). De invoering van een prijsplafond voor kleine verbruikers (E-RES en E-SSME) in Nederland heeft niet bijgedragen tot de handhaving van een gemiddelde concurrentiepositie voor het land, en is niet zo doeltreffend als het in Duitsland geldende prijsplafond. Er zij op gewezen dat zowel België als het VK een concurrentievoordeel hebben wat de BTW-component betreft, aangezien zij een veel lager tarief toepassen (respectievelijk 6% voor België en 5% in het VK) dan andere landen in het kader van deze studie.

Voor 2023 blijft Frankrijk het goedkoopste land voor het E-SSME-profiel dankzij het bestaande prijsgarantiemechanisme, gekoppeld aan sterke en aantrekkelijke stimulansen en een fiscaal stelsel. Het meest opvallende verschil met de resultaten van vorig jaar is de betere concurrentiepositie van België, de enige regio waar de grondstofkosten over het geheel genomen niet stijgen. Nederland blijft het duurste land, voornamelijk door de hoogste grondstofkosten en fiscale bijdragen. De totale elektriciteitsfactuur voor dit profiel is in België lager dan vorig jaar, waarbij Vlaanderen nu de goedkoopste regio in België is, op de voet gevolgd door Brussel en ten slotte Wallonië.

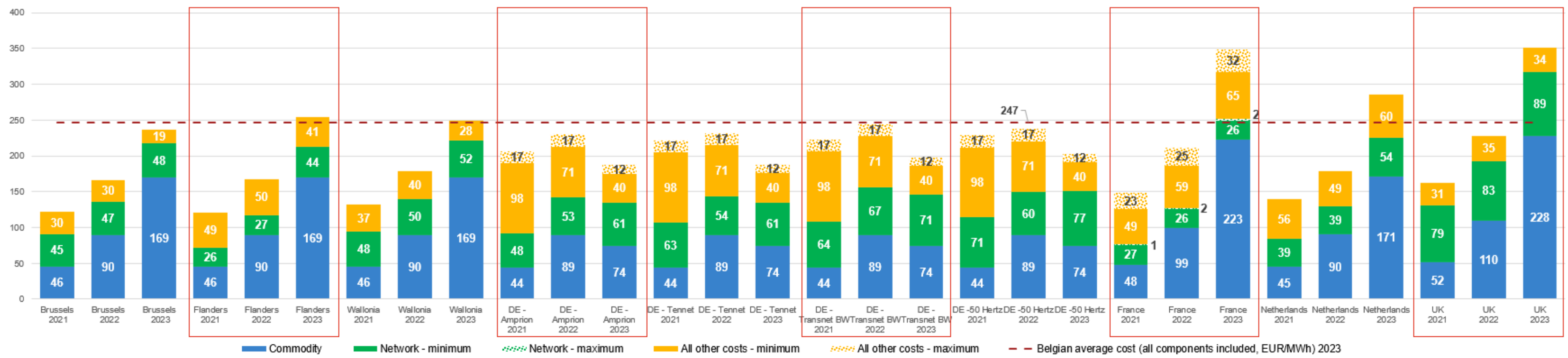
Elektriciteitsprijs per component in EUR/MWh (profiel E-SSME)



Terwijl in België de grondstoffenprijzen sinds vorig jaar in alle regio's zijn gestabiliseerd (en zelfs gedaald) voor E-RES en E-SSME, geldt dit niet voor E-BSME en E0-E4 profielen. Voor het tweede jaar op rij is er een aanzienlijke stijging van de grondstoffenprijs. Deze stijging is ook zichtbaar in alle andere landen/regio's in het kader van deze studie, behalve in Duitsland. De trend kan gedeeltelijk worden verklaard door de manier waarop de energieprijzen voor die profielen worden berekend. In de formule die voor de grotere profielen voor elektriciteit wordt gebruikt, wordt voornamelijk rekening gehouden met de termijnprijzen voor 2023 vanaf 2020 (termijn 3j), 2021 (termijn 2j) en 2022 (termijn 1j). Bijgevolg is de stijging van de spotprijzen in 2022 en 2023 slechts gedeeltelijk zichtbaar in de eindresultaten, aangezien de termijnprijzen van de afgelopen jaren nog niet alle informatie over hogere grondstoffenprijzen bevatten. De termijnprijzen van de voorgaande jaren hebben dus de neiging het effect van de hogere prijzen van vandaag (die tot vier keer de prijzen van twee jaar geleden kunnen bedragen) te minimaliseren.

Voor het E-BSME profiel, en in tegenstelling tot voorgaande jaren, tonen Frankrijk en het VK nu de duurste elektriciteitsrekening. Duitsland vertoont de meest competitieve factuur omdat het lagere grondstofkosten heeft (hetgeen wordt verklaard door het voor 2023 toegepaste prijsplafond). België is het op één na goedkoopste land. In België is Brussel het goedkoopste gewest voor dat profiel, voornamelijk dankzij een lagere gewestelijke belastingregeling, gevolgd door Wallonië en vervolgens Vlaanderen.

Elektriciteitsprijs per component in EUR/MWh (profiel E-BSME)



Vergelijking van de elektriciteitsprijzen voor industriële consumenten

In tegenstelling tot de residentiële en kleine professionele consumenten blijft de grote stijging van de grondstofprijs in alle onderzochte regio's/landen globaal voor de grotere verbruikers, behalve in Duitsland dankzij zijn plafonneringsmechanisme. Als alle kortingen in aanmerking worden genomen, is de laagste elektriciteitsprijs voor het consumentenprofiel E0 te vinden in Duitsland (meer bepaald de regio's Tennet en Amprion), gevolgd door Nederland en Vlaanderen. Een lage grondstofprijs en het potentieel om alle andere kosten (d.w.z. belastingen, heffingen en certificaatsystemen) te verlagen, verklaren grotendeels deze lagere prijzen in Duitsland. Als we Duitsland en zijn prijsplafondmechanisme buiten beschouwing laten, zit België in het lage gemiddelde van de jaarrekeningen van de andere bestudeerde landen voor de profielen E0, E1 en E2, terwijl het Verenigd Koninkrijk de duurste blijft.

Het resultaat voor Nederland is zeer variabel, naargelang de elektro-intensiteit. Terwijl de gemiddelde prijzen in Nederland lager zijn dan in bijna alle andere landen wanneer de verlagingen op alle andere kosten van toepassing zijn op elektro-intensieve consumenten, hebben industriële consumenten in Nederland een lagere concurrentiepositie wanneer deze verlagingen niet van toepassing zijn.

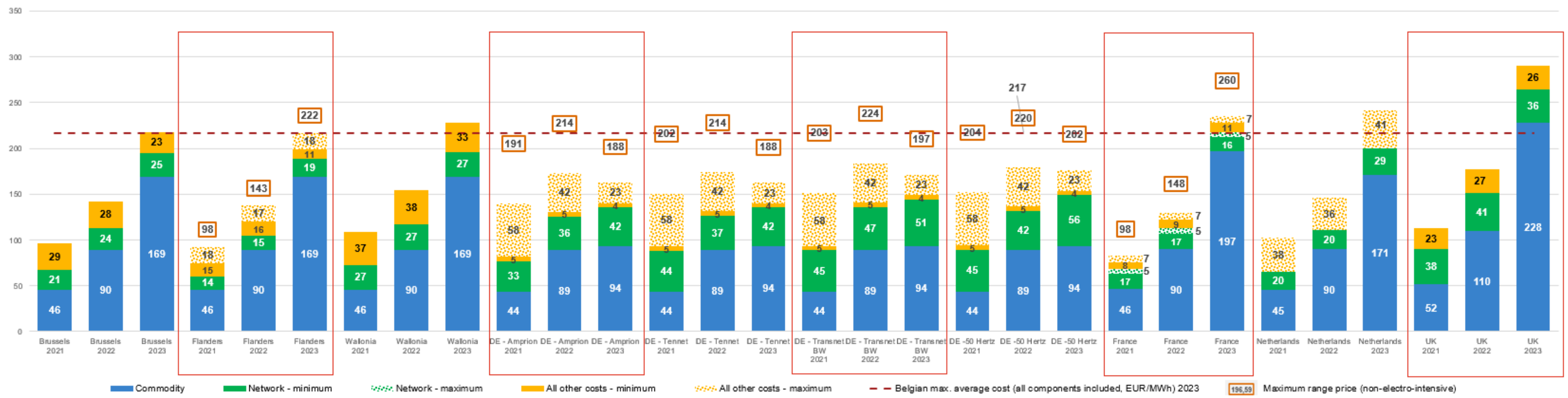
De prijzen in het Verenigd Koninkrijk zijn het hoogst, maar bij de toepassing van de tarieven wordt geen rekening gehouden met de elektro-intensiteit van de consumenten.

Binnen België zijn de elektriciteitskosten hoger in Wallonië, gevolgd door Brussel voor de profielen E0, E1 en E2[20]. Vlaanderen kan de goedkoopste regio in België zijn voor deze drie profielen dankzij lagere minimale alle andere kosten en lagere netwerkkosten. De nieuwe distributietariefstructuur in Vlaanderen die op 1 januari 2023 wordt ingevoerd, heeft zijn concurrentiepositie voor E0 en E1 niet gewijzigd. Rekening houdend met deze verschillende vaststellingen, wordt bevestigd dat Vlaanderen een competitieve regio is, zowel voor elektro-intensieve als niet-elektro-intensieve consumenten. Voor niet-elektro-intensieve consumenten worden de verschillen tussen de drie Belgische gewesten kleiner.

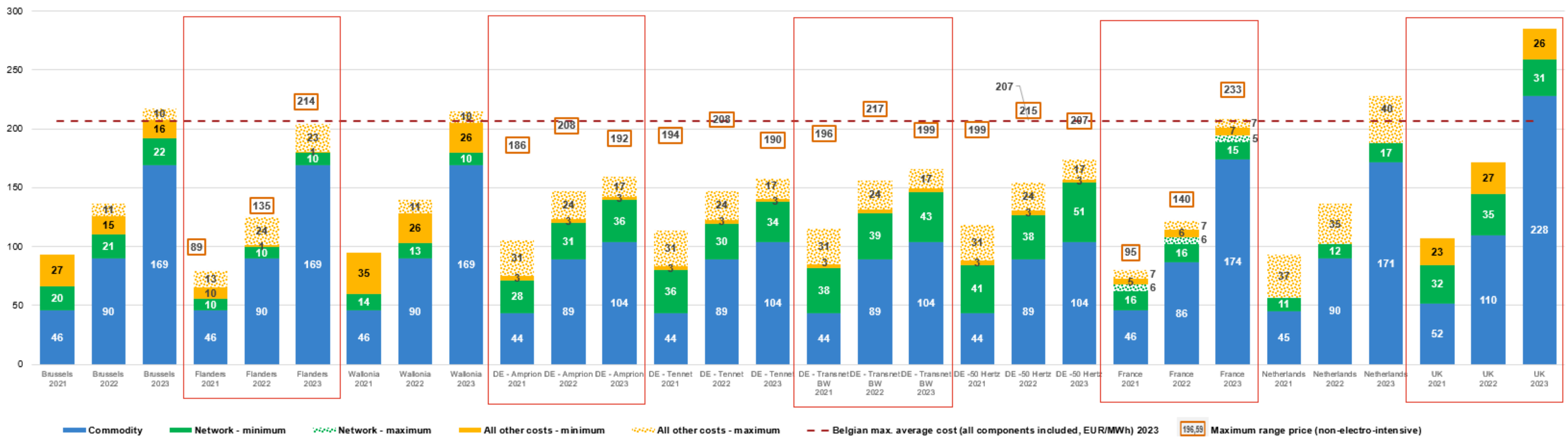
Voor niet-elektro-intensieve industriële consumenten ligt België op hetzelfde niveau als Duitsland en Nederland, terwijl Frankrijk en het Verenigd Koninkrijk duurder worden. Het kleine verschil tussen de facturen van de elektro-intensieve en niet-elektro-intensieve profielen is een voordeel voor de concurrentiepositie van België, wanneer men niet-elektro-intensieve consumenten onderling vergelijkt. Het betekent echter ook dat elektro-intensieve consumenten in België niet over een reductieregeling beschikken die even voordelig is als bijvoorbeeld in Duitsland.

[20] In tegenstelling tot eerdere studies werd de degressiviteitsfactor op de Waalse transportkosten toegepast in 2023. Deze degressiviteitsfactor van de kosten volgens de elektrische intensiteit maakt het mogelijk om de transportkosten betaald door de Waalse profielen E0 en E1 te verlagen. Het is dus noodzakelijk hiermee rekening te houden bij het uitvoeren van vergelijkende analyses tussen Wallonië en de andere gewesten, of België en de andere landen.

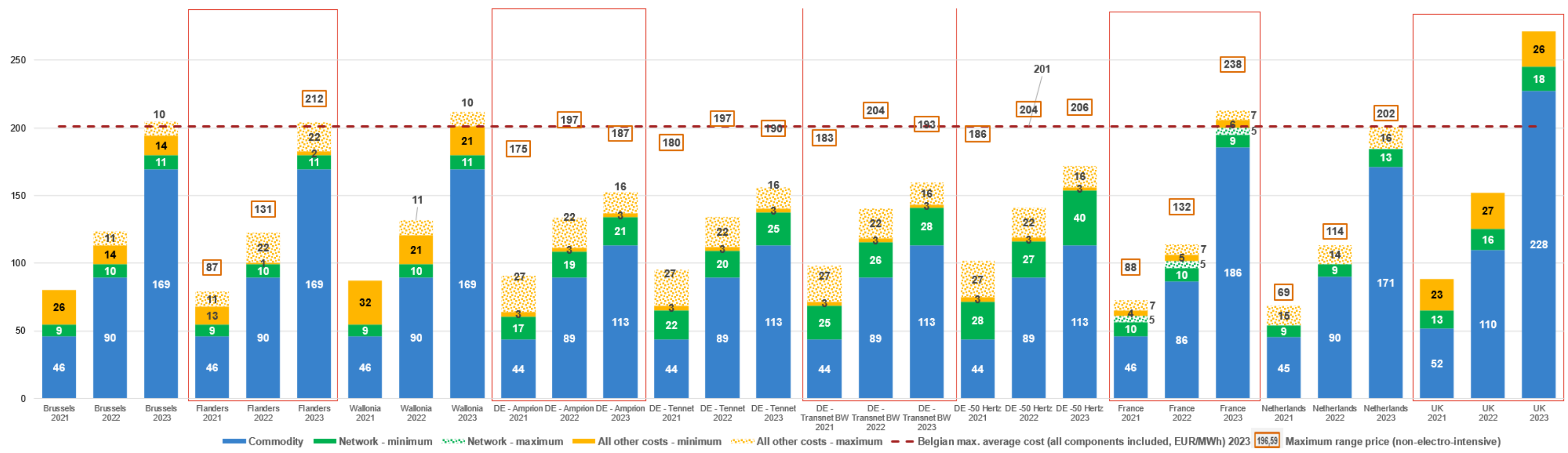
Elektriciteitsprijs per component in EUR/MWh (profiel E0)



Elektriciteitsprijs per component in EUR/MWh (profiel E1)



Elektriciteitsprijs per component in EUR/MWh (profiel E2)



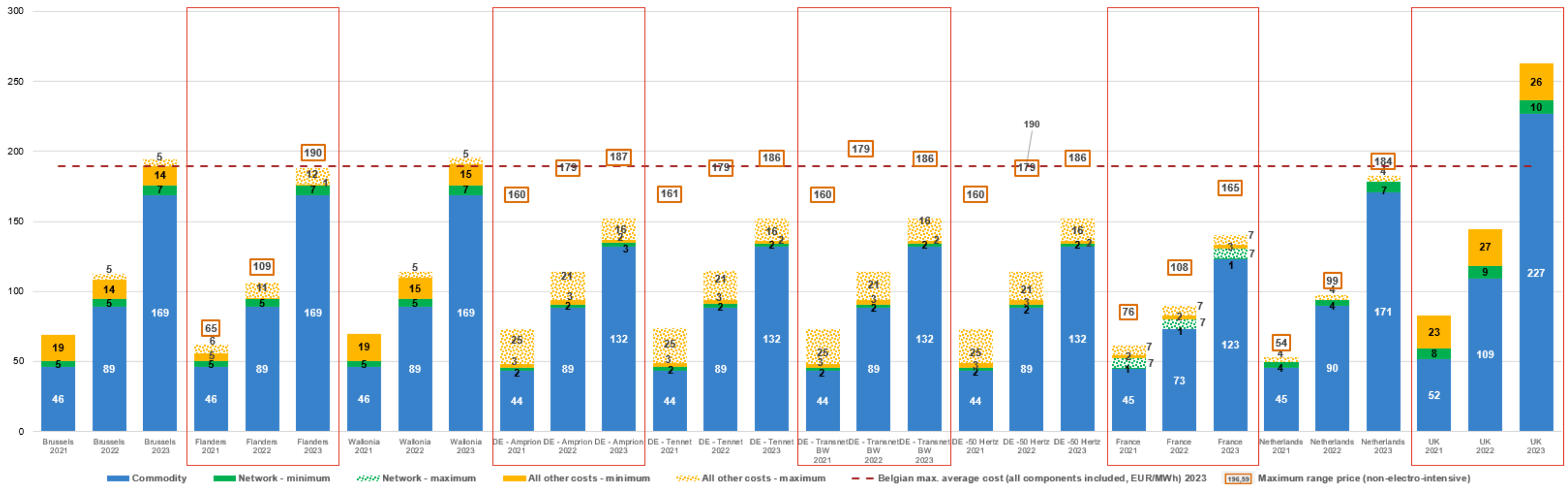
Wat de profielen E3 en E4 betreft, blijft Frankrijk het land met de laagste totale factuur van alle landen die onder het toepassingsgebied van deze studie vallen, voornamelijk dankzij het bestaande ARENH-mechanisme[21]. Aan de andere kant van het spectrum blijft het Verenigd Koninkrijk het duurste land voor de E3- en E4-profielen. Dit is te verklaren door grondstofprijzen die meer dan 35% hoger liggen dan in enig ander land. Voor de profielen E3 en E4 zien we twee groepen landen. De landen met lage convergerende prijzen, zoals Frankrijk en Duitsland, en landen met gemiddeld convergerende prijzen voor Nederland en België, terwijl het VK een uitschieter is.

In België stellen we vast dat voor de E3- en E4-profielen Vlaanderen steeds de meest competitieve regio is voor de elektro-intensieve consumenten, en dat zijn positie wordt betwist voor de niet-elektro-intensieve consumenten, wat relatief in lijn is met het resultaat van vorig jaar. Aangezien de grondstofkosten en netwerkkosten over alle Belgische gewesten geharmoniseerd zijn, hangt dit alleen af van de component "alle andere kosten". Het is belangrijk op te merken dat de grootste energieverbruiker in Brussel dichter bij een E3-profiel zit dan bij een E4-profiel. Het E4-profiel is dus een zuiver theoretische vaststelling voor dit gewest omdat er in het Brusselse gewest geen zeer grote industriële consumenten zijn.

[21] ARENH staat voor « Accès Régulé à l'Électricité Nucléaire Historique » (Gereguleerde toegang tot historische nucleaire elektriciteit). Dit is een mechanisme waarmee alle alternatieve leveranciers stellen om elektriciteit te betrekken van EDF (de historische elektriciteitsleverancier in Frankrijk) onder voorwaarden die door de overheid zijn vastgesteld.

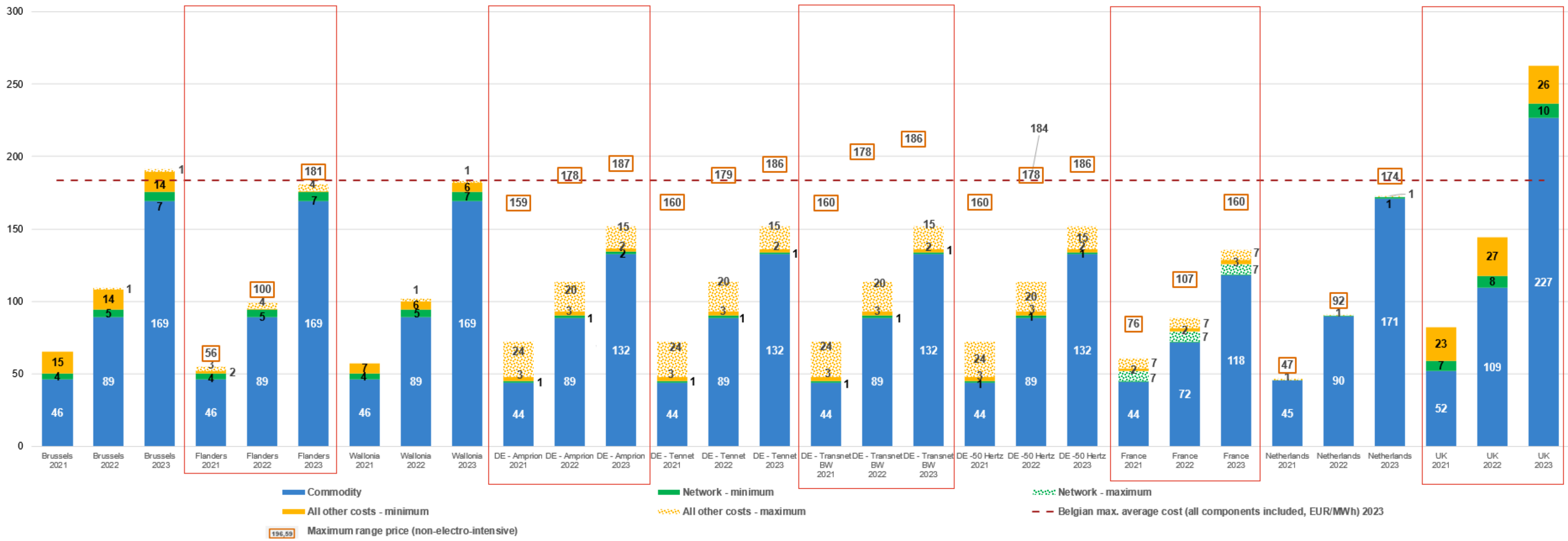
Voor het E3-profiel blijft België, ondanks zijn lagere grondstofprijzen in lijn met andere landen (na Frankrijk en Duitsland), gehinderd door hogere alle overige kosten, vooral in Brussel en Wallonië. Het begrip elektro-intensiteit levert minder reducties op dan in Vlaanderen, waar de component "alle andere kosten" lager is dan in de andere gewesten. België is gemiddeld iets duurder, wanneer wordt gekeken naar niet-elektro-intensieve profielen, dan Nederland, maar minder duur dan het VK en Duitsland. De kosten van België voor belastingen, heffingen en certificeringsregelingen zouden op één lijn liggen met die van Duitsland en Nederland als zij geen verlagingen voor elektro-intensieve consumenten zouden toepassen.

Elektriciteitsprijs per component in EUR/MWh (profiel E3)



Het E4-profiel vertoont een soortgelijke trend als het E3-profiel, waarbij Frankrijk het goedkoopste land is, gevolgd door Duitsland en Nederland. Nederland en België convergeren wat betreft de totale elektriciteitsfactuur, maar met verschillen in hun prijsstructuur. In vergelijking met Nederland vertoont België (vergelijkbaar met het E3-profiel) relatief hoge alle andere kostencomponenten, iets lagere grondstoffenprijzen en hogere netwerkkosten. Ook hier blijft het VK veruit het duurste land.

Elektriciteitsprijs per component in EUR/MWh (profiel E4)



Met betrekking tot elektriciteit voor industriële consumenten wordt in dit rapport gewezen op de grote complexiteit als gevolg van overheidsinterventies om de elektriciteitskosten voor bepaalde categorieën grote industriële consumenten te verlagen. Deze interventies zijn erop gericht de last van de netkosten en de componenten van alle andere kosten (d.w.z. belastingen, heffingen, certificaatsystemen) te beïnvloeden. België, Frankrijk, Duitsland en Nederland passen belastingverlagingen/caps toe op basis van een reeks specifieke economische criteria die doorgaans verband houden met de elektro-intensiteit. Als specifieke verlagingen rechtstreeks kunnen worden toegepast (bijvoorbeeld verlagingen van de netwerkkosten in Duitsland), hebben wij de resultaten gepresenteerd voor het brede scala van mogelijkheden. Wat de belastingverminderingen betreft, zijn de door Nederland vastgestelde criteria (jaarlijkse afname van 10 GWh of activiteit) het minst veeleisend. De toepassing van deze verlagingen leidt tot een verandering in de concurrentiepositie van de andere landen in het toepassingsgebied: Duitsland wint een zeer competitieve positie voor elk bestudeerd profiel, voor consumenten die wel aan de reductiecriteria voldoen en dus elektro-intensief zijn; Nederland en Vlaanderen, worden iets goedkoper; en Frankrijk blijft de meest competitieve regio die is waargenomen, wat nog belangrijker wordt dankzij deze reducties. Ten slotte is Frankrijk het enige land dat de stijging van de grondstofkosten heeft verlicht dankzij het ARENH-mechanisme, in Duitsland werd dit ondervangen door de invoering van het prijsplafond in 2023. Het Verenigd Koninkrijk biedt nog steeds geen verlaging/vrijstelling voor elektro-intensieve consumenten, hetgeen gevolgen heeft voor zijn relatieve concurrentievermogen.

Vergelijking van de aardgasgasprijzen

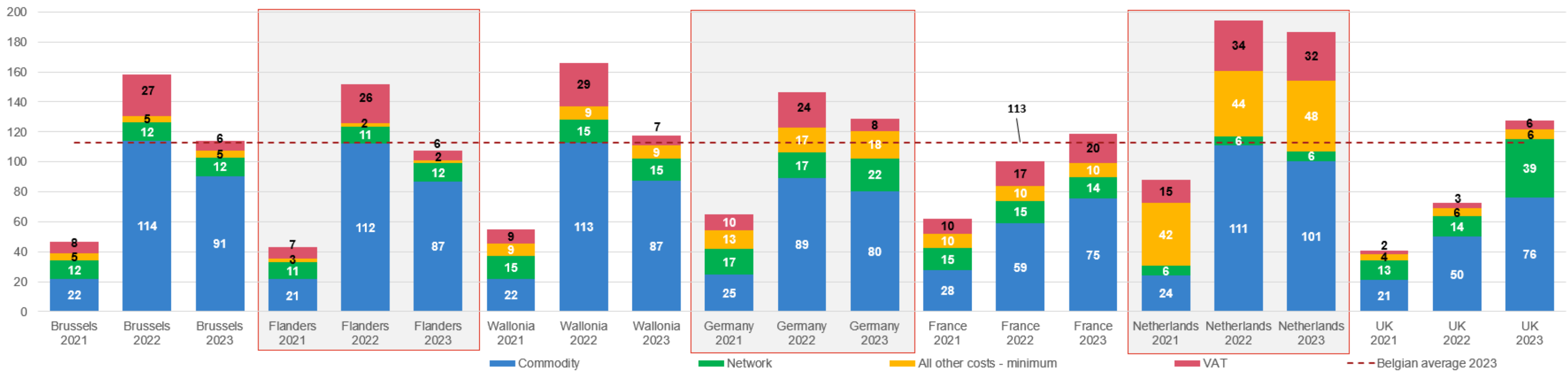
Vergelijking van de aardgasprijzen voor residentiële en kleine professionele consumenten

Voor residentiële consumenten (G-RES) is België het minst dure land in 2023, op de voet gevolgd door Frankrijk, het Verenigd Koninkrijk en Duitsland. Nederland is het duurste land voor residentiële consumenten. De goede resultaten van België kunnen worden verklaard door lagere netwerkkosten en een lage btw-component. Binnen België is Vlaanderen goedkoper dan Brussel en Wallonië door lagere andere kosten. Wallonië heeft de hoogste netwerkkosten en Brussel heeft de hoogste grondstofkosten in 2023. Anderzijds kunnen de goede prestaties van Frankrijk en het Verenigd Koninkrijk worden verklaard door de laagste grondstoffenprijzen van de onderzochte regio's/landen. Zoals vorig jaar al het geval was, staat Duitsland nog steeds in de middenmoot, met prijzen die hoger liggen dan die van België en Frankrijk, maar lager dan die van het Verenigd Koninkrijk en Nederland. De Duitse grondstofkosten en btw daalden, maar de netwerk- en andere kosten stegen in 2023.

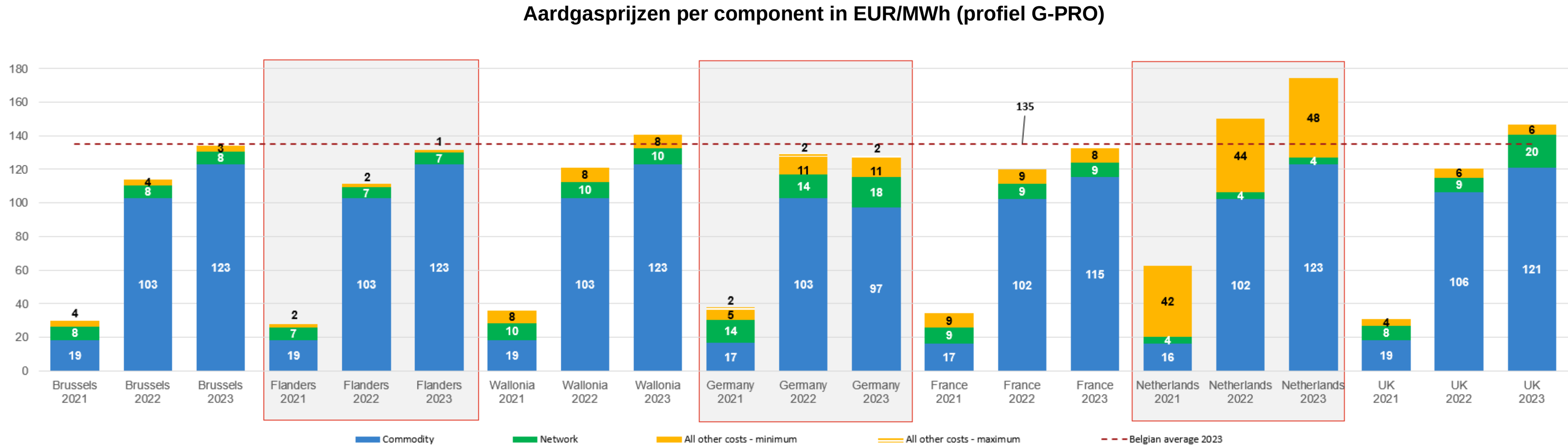
Bij een vergelijking met de resultaten van vorig jaar blijkt dat België, Duitsland en Nederland hun prijzen zien dalen, waarbij België de grootste daling vertoont. Ondanks een daling blijft Nederland het duurste land door hogere belastingen en hogere andere kosten dan de andere geanalyseerde regio's/landen. Frankrijk en het VK daarentegen zien hun prijzen ten opzichte van vorig jaar stijgen met respectievelijk 19% en meer dan 75%. Waar het VK in 2022 lagere grondstofkosten had dan de andere regio's/landen, steeg de totale factuur voor aardgas voor residentiële consumenten door een hogere grondstofprijs in combinatie met hogere netwerkkosten.

Het is ook belangrijk hier op te merken dat de prijsvergelijkingsinstrumenten die voor de 3 Belgische gewesten worden gebruikt, hun prijsberekeningsmethoden hebben gewijzigd: in 2023 worden toekomstgerichte prijzen gebruikt in plaats van historische prijzen als basis in 2022.

Aardgasprijzen per component in EUR/MWh (profiel G-RES)



Voor professionele consumenten (G-PRO) laten alle landen behalve Duitsland (dankzij zijn prijsplafondmechanisme) een stijging van de totale kosten zien. Duitsland is het goedkoopste land in 2023, op de voet gevolgd door Frankrijk en België. In België heeft Vlaanderen de laagste totale factuur, gevolgd door Brussel en vervolgens Wallonië. Onder invloed van lage belastingen (behalve in Wallonië) is de gemiddelde Belgische factuur bijna de goedkoopste van alle onderzochte landen en 23% goedkoper dan de Nederlandse aardgasfactuur voor dit profiel (de duurste).



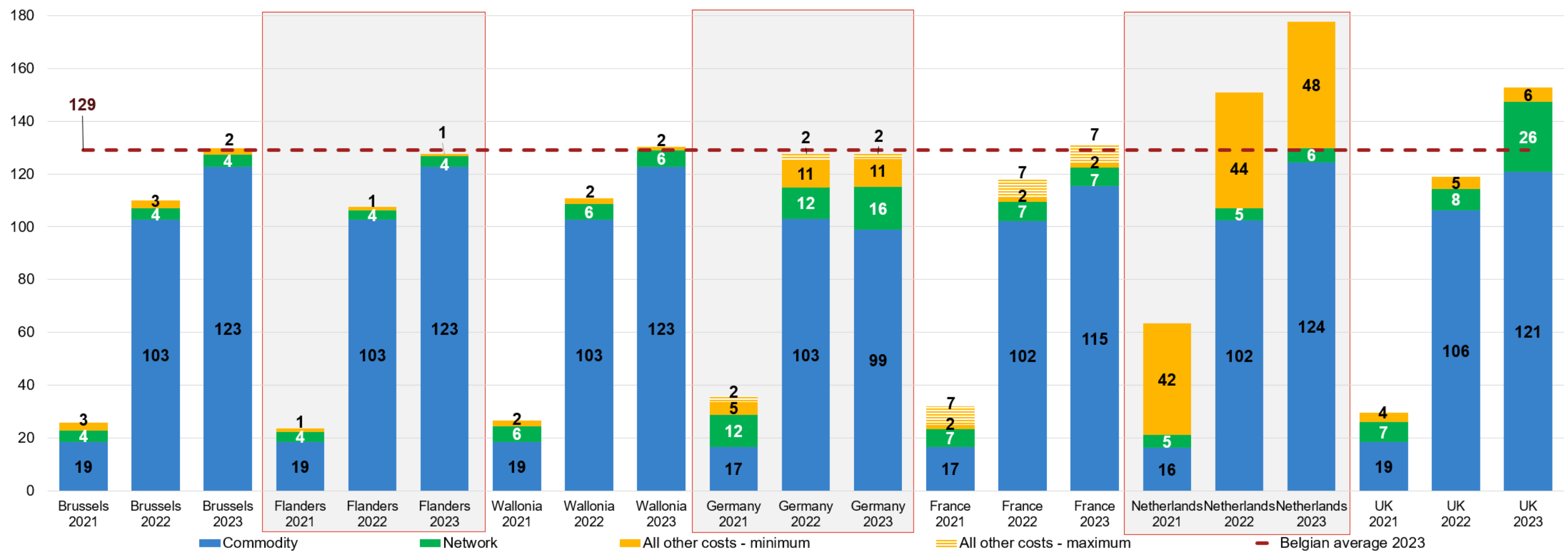
Het Verenigd Koninkrijk staat prijstechnisch in de middenmoot, maar is dit jaar na Nederland het duurste land. In het VK zijn de netwerkkosten gestegen in vergelijking met 2022 en 2023, wat de totale factuur negatief beïnvloedt. Nederland is het duurste land voor het G-PRO profiel, vanwege de hoge overige kostencomponent.

Vergelijking van aardgasprijzen voor industriële consumenten

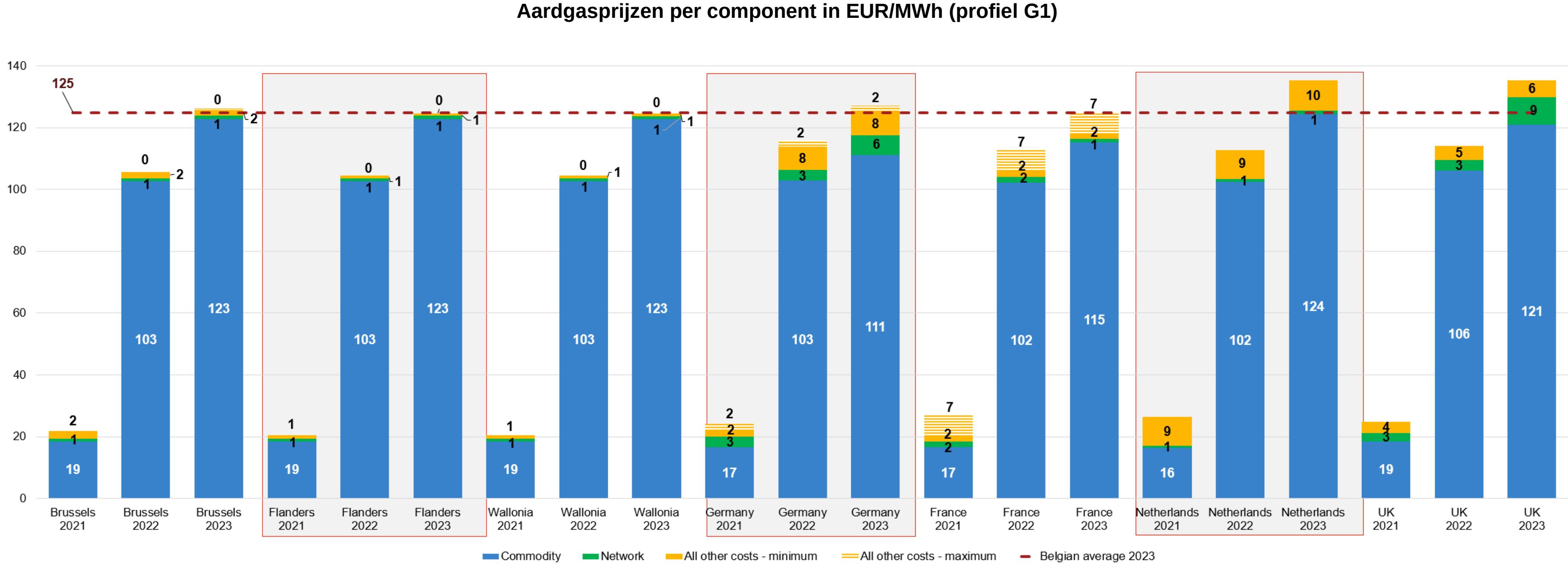
Voor aardgas lijkt het overheidsingrijpen in netwerkkosten en belastingen minder merkbaar dan voor elektriciteit. Bovendien is de complexiteit van de bestaande mechanismen veel geringer, ook al bestaan er kortingen of vrijstellingen.

We stellen dit jaar opnieuw een vrij grote stijging vast van de totale jaarlijkse factuur voor industriële aardgasverbruikers, hoewel deze stijging lager is dan die welke in 2022 werd waargenomen. In het algemeen is België opnieuw vrij competitief wat aardgas betreft, dankzij de relatief lage prijzen van alle andere kosten en van de netwerkcomponenten. Voor profiel G0 is België het tweede goedkoopste land zonder reducties, op de voet gevolgd door Duitsland dat in 2023 het goedkoopste land is. Met reducties wordt Frankrijk het goedkoopste land. Binnen België is Vlaanderen de meest concurrerende regio dankzij de laagste netwerk- en andere kosten, terwijl Wallonië de duurste regio is. Nederland is opnieuw het duurste land vanwege de hoge overige kosten, gevolgd door het Verenigd Koninkrijk. Wat het G-PRO-profiel betreft, ziet het VK opnieuw een grote stijging van zijn netwerkkostencomponent. Duitsland is het enige land dat in 2023 lagere grondstofkosten heeft dan in 2022.

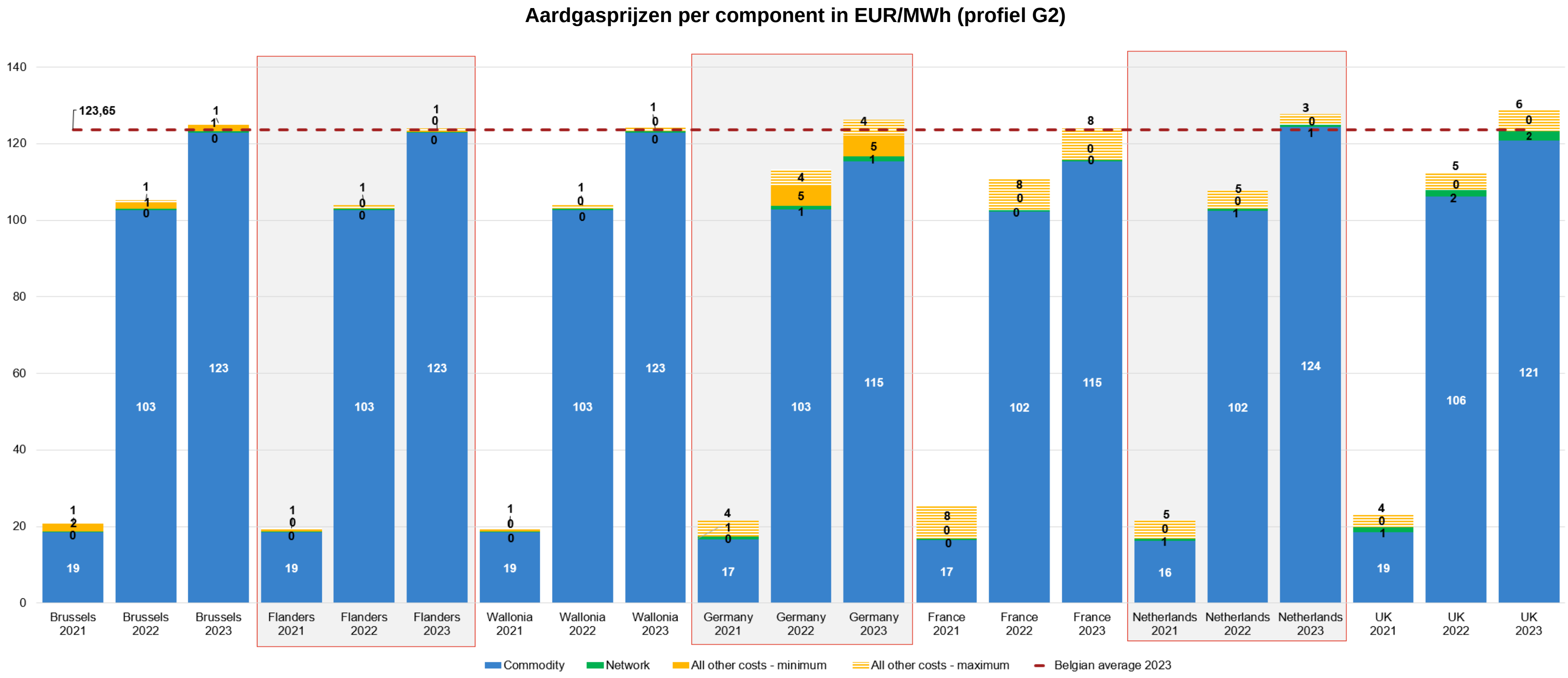
Aardgasprijzen per component in EUR/MWh (profiel G0)



Voor het G1-profiel is Frankrijk in 2023 met een kleine marge het minst dure land, op de voet gevolgd door België en Duitsland, die allemaal vrij vergelijkbare totale factuurbedragen laten zien. Nederland is het duurste land, op de voet gevolgd door het Verenigd Koninkrijk. Hoewel de grondstofkosten in België zijn gestegen, zijn de netwerk- en andere kosten in de drie gewesten vrij vergelijkbaar gebleven met de resultaten van 2022. In België is Vlaanderen het goedkoopste gewest met de kleinste marge, op de voet gevolgd door Wallonië en Brussel.



Voor het G2-profiel is België het goedkoopste land, op de voet gevolgd door Frankrijk, wanneer geen rekening wordt gehouden met kortingen. Wanneer de maximale reducties worden toegepast, is Frankrijk het goedkoopste land, gevolgd door Duitsland en met het VK en België op de derde plaats. De grondstoffenprijzen zijn voor alle landen gestegen, terwijl de netwerk- en andere kosten vrij gelijk zijn gebleven ten opzichte van 2022. Duitsland (voornamelijk dankzij het prijsplafondmechanisme) en Frankrijk hebben de laagste grondstofkosten, maar Duitsland heeft de hoogste andere kosten.



Inspanningen voor het betalen van de energiefacturen voor kwetsbare consumenten

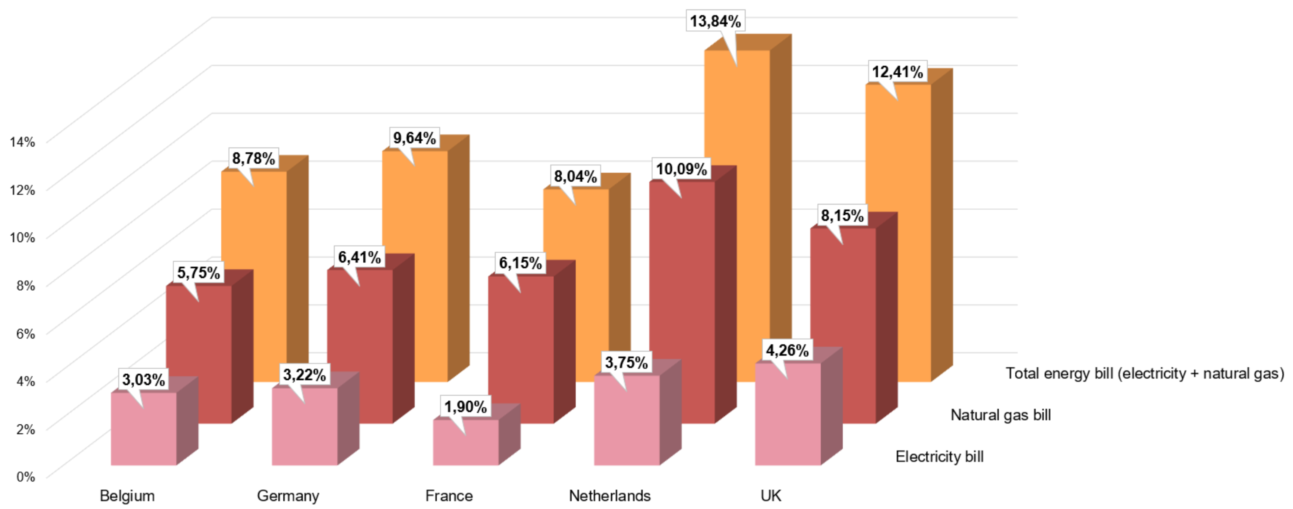
In hoofdstuk 8 worden de verschillende maatregelen geëvalueerd die de landen, onderzocht in deze studie, hebben genomen om het effect van stijgende energieprijzen en inflatie voor zowel particuliere als professionele consumenten op te vangen. Die maatregelen kunnen gaan van sociale tarieven tot directe financiële steun om de factuur van de consument te verlagen. De verscheidenheid van de maatregelen maakt een vergelijking tussen de landen echter complex.

Het is belangrijk op te merken dat de hier gepresenteerde resultaten geen rekening houden met eenmalige kortingen op de energiefactuur zoals de energiekredietnota in België, de energievouchers in Frankrijk of de korting op de energiebelasting voor elektriciteit in Nederland. De reden hiervoor is dat het bedrag van deze kortingen sterk kan variëren afhankelijk van de kenmerken van het huishouden.

Inspanningsgraad in vergelijking met het gemiddelde beschikbare inkomen (woonlasten afgetrokken)

In deze eerste weergave kijken we naar het gewicht van de energiefactuur op een huishouden met een gemiddeld beschikbare inkomen (2 werkenden), na aftrek van een van de belangrijkste delen van de gezinsuitgaven, namelijk de woonlasten. Onderstaande figuur laat duidelijk zien dat voor alle landen die onder de studie vallen, de elektriciteitsfactuur duidelijk minder impact heeft op het budget dan de aardgasfactuur.

Belang van de energierekening ten opzichte van het gemiddeld beschikbaar inkomen (in %)



Frankrijk is het land waar de elektriciteitsrekening het minst zwaar weegt, met minder dan 2% van het jaarlijks beschikbaar inkomen (woonlasten afgetrokken). België komt op de tweede plaats met een gemiddelde van ongeveer 3% van het beschikbaar inkomen. Daarna volgen Duitsland en Nederland, terwijl het Verenigd Koninkrijk het land is waar de elektriciteitsrekening het zwaarst weegt, met meer dan 4% van het beschikbaar inkomen.

Wat aardgas betreft, is België het land waar de rekening het minst zwaar weegt in vergelijking met het beschikbaar inkomen, met een gemiddelde van minder dan 6%. Frankrijk komt op de tweede plaats, op de voet gevolgd door Duitsland, beide rond de 6%. In het Verenigd Koninkrijk, en in sterkere mate in Nederland, weegt de aardgasrekening het zwaarst met respectievelijk meer dan 8% en meer dan 10% van het beschikbaar inkomen.

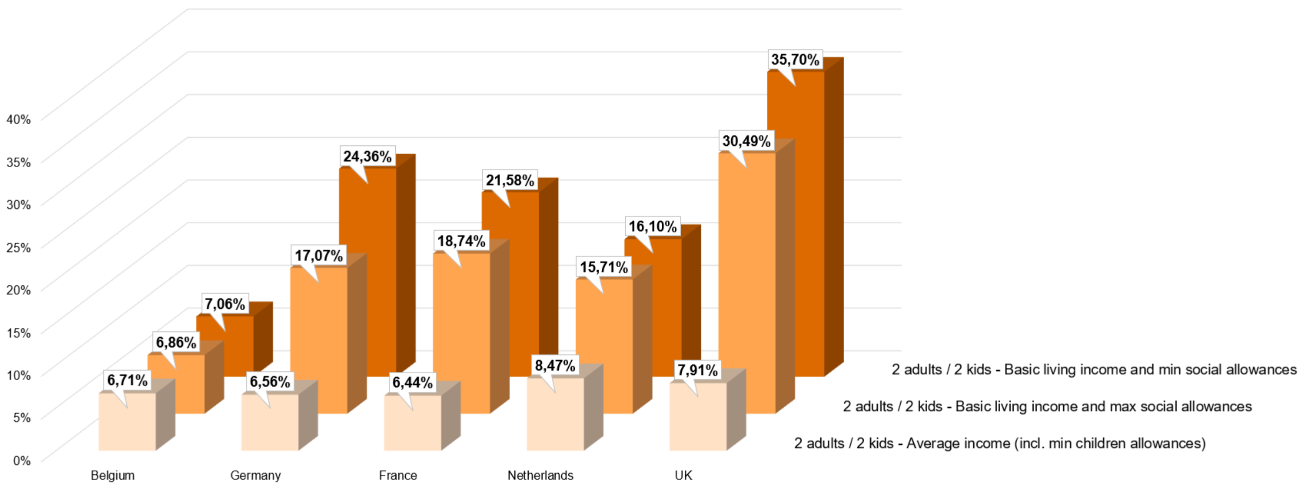
Over het geheel genomen is Frankrijk het land waar het totale gewicht van de energiefactuur het laagste is in vergelijking met het beschikbare inkomen (ongeveer 8%), voornamelijk dankzij het concurrentievoordeel op het gebied van elektriciteit. België komt op de tweede plaats met een cijfer van ongeveer 9%. Het Verenigd Koninkrijk en Nederland zijn de landen waar de energiefactuur het zwaarst weegt, met respectievelijk meer dan 12% en bijna 14%.

Inspanningsgraad in vergelijking met het totale beschikbaar inkomen

In deze tweede weergave beoordelen we het gewicht van de gemiddelde energiefactuur op mensen die het gemiddelde inkomen van het land verdienen, afgezet tegen de impact die deze heeft op de meest kwetsbare mensen. Om dit te doen, worden alle sociale maatregelen die kunnen worden gekwantificeerd opgeteld bij het basisinkomen dat ons typische huishouden (2 volwassen ouders en 2 kinderen) zou kunnen verdienen zonder andere inkomstenbronnen te hebben. Dit keer trekken we het woonlasten niet af van het beschikbare inkomen. Aangezien de meeste huishoudens met een minimuminkomen ook op dat gebied vaak aanzienlijke steun ontvangen, zou dat inderdaad een vertekend beeld geven van de werkelijkheid.

Zoals uit onderstaande figuur blijkt, zien we bij een vergelijking van het inspanningspercentage voor de totale energiefactuur tussen de landen voor een huishouden met een gemiddeld inkomen, dat Frankrijk het land is waar de energiefactuur verhoudingsgewijs het minst weegt, op de voet gevolgd door Duitsland en België. Het Verenigd Koninkrijk volgt, gevolgd door Nederland, dat een inspanning laat zien die ongeveer 30% hoger ligt dan in Frankrijk.

Inspanningspercentage energierekening ten opzichte van het beschikbaar inkomen (in %)



Niet verrassend wordt de situatie veel ingewikkelder als we kijken naar de huishoudens met de laagste inkomens. In dat geval kan België opnieuw een vrij laag gewicht van de energiefactuur ten opzichte van een basisinkomen handhaven dankzij een beschikbaar sociaal tarief. Dit helpt om het gewicht van de energiefactuur nagenoeg gelijk te houden aan dat van een huishouden met een gemiddeld inkomen. Nederland volgt, met een totale energiefactuur die ongeveer 16% van het beschikbare inkomen uitmaakt, afhankelijk van het al dan niet ontvangen van maximale sociale uitkeringen. Duitsland volgt met een totale energiefactuur die ongeveer 17% uitmaakt wanneer maximale sociale uitkeringen kunnen worden waargenomen. De situatie is echter veel slechter wanneer alleen minimale sociale uitkeringen kunnen worden waargenomen. In dat geval bedraagt het gewicht van de energierekening ongeveer een kwart van het beschikbare inkomen. Frankrijk volgt met een inspanningspercentage van ongeveer 19% tot 22% voor huishoudens met de laagste inkomens. Ten slotte is het VK opnieuw het land met de zwaarste rekening in verhouding tot het beschikbaar inkomen voor de meest blootgestelde huishoudens, met cijfers die variëren van 30% tot meer dan 35% van het beschikbaar inkomen. De totale energierekening in het VK kan dus een onevenredig zware last leggen op huishoudens die het grootste risico lopen op energiearmoede.

<u>Opmerking:</u> Opmerking: De in dit hoofdstuk gevolgde aanpak heeft beperkingen, aangezien die niet noodzakelijk overeenstemt met het verbruiksprofiel van sommige mensen in een situatie van energiearmoede (zoals een geïsoleerde persoon zonder kinderen bijvoorbeeld). Bovendien houdt het ook geen rekening met het feit dat sommige meer blootgestelde mensen zouden beslissen om minder energie te verbruiken om bijvoorbeeld hun energiefactuur te verlagen. Aangezien het uiteindelijke doel van dit hoofdstuk is de inspanning te bepalen die nodig is om de energierekening te betalen (en deze te vergelijken tussen landen om het effect van de energierekening in relatieve termen te beoordelen), geloven wij dat deze aanpak echter robuust genoeg is om conclusies te trekken. Hoofdstuk 8 biedt meer inzicht in deze observaties.

Evaluatie van de Belgische industriële competitiviteit

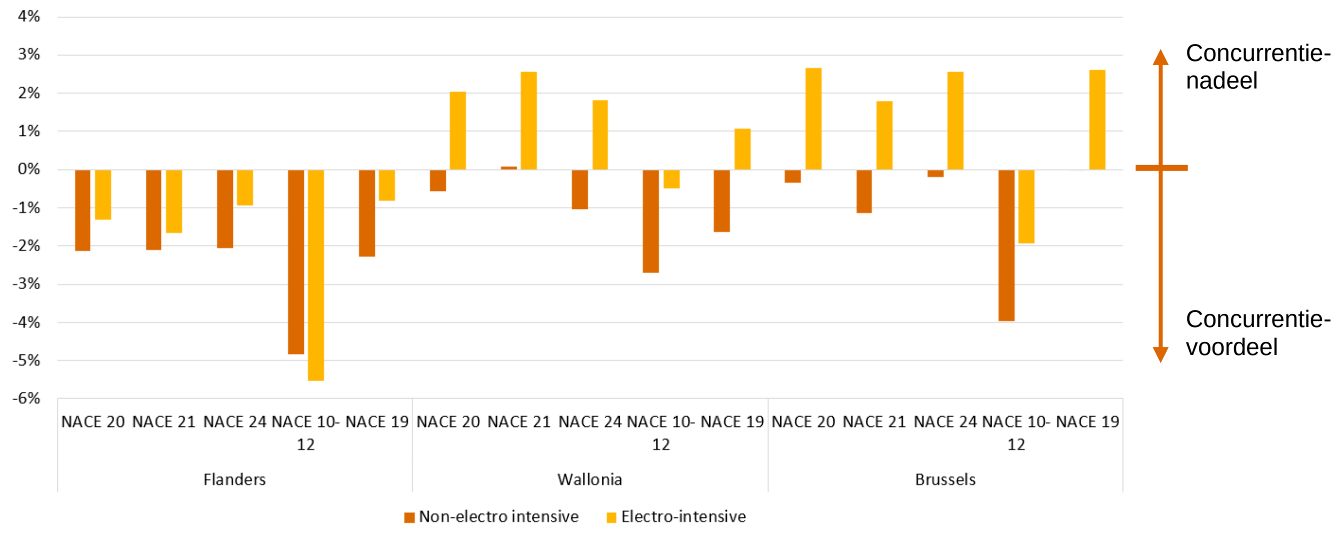
In een laatste hoofdstuk worden de sector- en regio specifieke elektriciteits- en aardgasprijzen geanalyseerd aan de hand van hun effect op het concurrentievermogen van de Belgische industriële consumenten ten opzichte van hun concurrenten in het buitenland. Deze resultaten hebben betrekking op industriële consumenten uit de in punt 3.3 genoemde geselecteerde sectoren, namelijk: levensmiddelen en dranken (NACE 10-12), cokes en geraffineerde aardolieproducten (NACE 19), chemische producten (NACE 20), farmaceutische producten (NACE 21) en de vervaardiging van metalen in primaire vorm (NACE 24). Deze sectoren vertegenwoordigen 0,10% tot 2,04% van de bruto toegevoegde waarde van België en 0,53% tot 2,04% van de totale werkgelegenheid[22].

Aangezien wij constateerden dat het VK een opvallende uitschieter was, werden de resultaten gedifferentieerd naargelang het VK al dan niet in de vergelijking werd opgenomen. Wanneer het VK wordt meegerekend, blijkt uit onze resultaten dat niet-elektro-intensieve industriële consumenten in België die concurreren met niet-elektro-intensieve consumenten in de buurlanden een concurrentievoordeel hebben in de meeste sectoren, waarbij die in Vlaanderen voor alle sectoren de grootste concurrentievoordelen van België genieten in de zin van totale energiekosten. Dit verandert in een concurrentienadeel voor alle sectoren en regio's wanneer het Verenigd Koninkrijk buiten beschouwing wordt gelaten.

Voor elektro-intensieve consumenten is het verschil met en zonder het VK nog duidelijker. In feite vertonen alle sectoren in de drie regio's concurrentienadelen wanneer het VK niet wordt meegerekend, terwijl hun concurrentievermogen verbetert wanneer het VK wel wordt meegerekend. Voor elektro-intensieve consumenten blijft Vlaanderen concurrerender dan zijn buurlanden wanneer het Verenigd Koninkrijk wordt meegerekend, en gaat het over naar een concurrentienadeel wanneer het Verenigd Koninkrijk niet wordt meegerekend.

Wanneer het Verenigd Koninkrijk wordt meegerekend, is de concurrentiepositie van België veranderd ten opzichte van vorig jaar. Brussel en Wallonië zien hun concurrentievermogen afnemen en hebben in de meeste sectoren alleen een concurrentievoordeel voor niet-elektro-intensieve consumenten en een concurrentienadeel voor elektro-intensieve consumenten. In dezelfde trend ziet Vlaanderen zijn concurrentievoordeel licht afnemen ten opzichte van 2022 voor zowel elektro- als niet-elektro-intensieve consumenten, hoewel dit het meest competitieve Belgische gewest blijft.

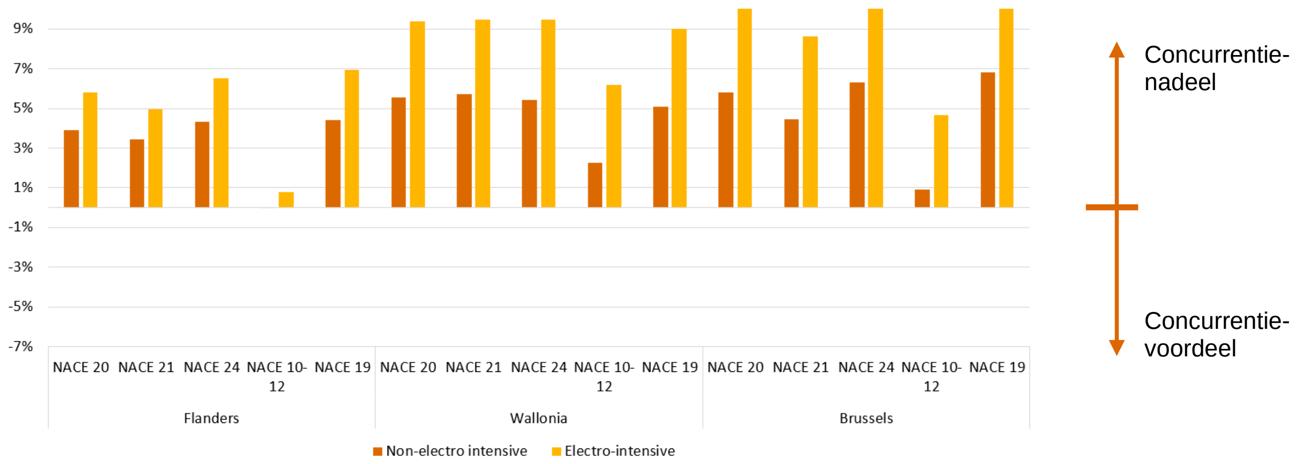
Gewogen energie (elektriciteit en aardgas) kostenverschillen tussen de Belgische regio's en de gemiddelde kosten van de buurlanden (inclusief het VK) voor elektro-intensieve en niet-elektro-intensieve consumenten



[22] Nationale waarden voor 2016, die zijn opgevraagd bij Eurostat.

Zoals hierboven vermeld, is de situatie anders wanneer het VK buiten beschouwing wordt gelaten. In vergelijking met 2022 stellen we namelijk vast dat Vlaanderen zijn concurrentievoordeel bij niet-elektro-intensieve consumenten verliest en de daling van de afgelopen jaren voortzet. Wat de elektro-intensieve consumenten betreft, vertoont Vlaanderen voor alle sectoren dezelfde concurrentienadelen, maar op grotere schaal. Net als in 2022 hebben de elektro-intensieve consumenten in Brussel en Wallonië nog steeds concurrentienadelen. Zoals de conclusies van de analyse met inbegrip van het VK, stellen we geen definitieve convergentie vast voor alle onderzochte regio's/landen.

Gewogen energy (elektriciteit en aardgas) kostenverschillen tussen de Belgische regio's en de gemiddelde kosten van de buurlanden (exclusief het VK) voor elektro-intensieve en niet-elektro-intensieve consumenten



In het algemeen kunnen niet-elektro-intensieve consumenten in België dit jaar nog steeds profiteren van concurrerende prijzen in vergelijking met hun tegenhangers in de buurlanden, ondanks de sterke stijging van de grondstoffenprijs. Anderzijds zijn de elektro-intensieve verbruikers, vooral in Brussel en Wallonië, meer blootgesteld aan een gebrek aan concurrentievermogen. Ondanks de inspanningen die in Vlaanderen en op federaal niveau reeds zijn geleverd, blijkt uit deze resultaten dus nog steeds dat Brussel en Wallonië de nodige maatregelen moeten nemen om het concurrentievermogen van hun industrieën te verbeteren. Voor Vlaanderen betekent dit dat de inspanningen om enig concurrentievermogen in bepaalde specifieke industrieën te behouden, moeten worden voortgezet.

Als conclusie zou dit kunnen dienen als basis voor een meer gedetailleerde bespreking van mogelijke federale en/of regionale interventies om het concurrentievermogen van de Belgische consumenten te versterken door bijvoorbeeld in te grijpen in heffingen en/of tarieven. Wat dit laatste betreft, biedt de Europese Commissie via het CEEAG[23] een kader dat kan worden benut voor het ontwerpen en/of aanpassen van belastingen ter ondersteuning van de ontwikkeling van hernieuwbare energie.

[23] Richtsnoeren inzake staatssteun voor klimaat, milieubescherming en energie in de Europese Unie - januari 2022

2. Introduction

2. Introduction

This report is commissioned by the Belgian federal regulator for electricity and natural gas (CREG) and the three Belgian regional regulators: Brugel (Brussels), the CWaPE (Wallonia) and the VREG (Flanders) – and supported by FORBEG[24]. In the framework of their larger mission of supervising transparency and competition on the market, ensuring market conditions serve the public interest and safeguarding consumers' interests, PwC was asked to conduct a study comparing energy prices for residential, small professional and industrial consumers in Belgium and the neighbouring countries.

The purpose of this study is to compare the electricity and natural gas prices, in total as well as per component, billed to residential, small professional and large industrial consumers in the three Belgian regions (Brussels, Flanders and Wallonia) with those in Germany, France, the Netherlands and the UK. This report comes as the fourth edition of a multiple-year evaluation which started in 2020. As such, electricity and natural gas prices used in this study were retrieved in January 2023, except for residential profiles in February 2023. This exception is linked to the data collection process initiated at the end of January, where the price comparison tools in some countries/regions were already only displaying prices applicable as of February 2023. To avoid any bias when comparing the different countries/regions in scope of this study, it was decided to use the prices in force in February 2023 for residential profiles.

In addition to the price analysis, the purpose of this study is to further investigate the impact of energy price differences on two specific consumer groups, namely the vulnerable residential consumers and the Belgian industry. For the vulnerable consumers the report will estimate the effort made by the government(s) and/or other instances to help these customers pay their energy bills while for the industrial consumers we will analyse how the price differences impact the Belgian industry. It also pays special attention to reduction schemes that are beneficial to electro-intensive industrial consumers qualifying for certain criteria.

This report consists of four different sections.

The **first section** (described in chapters 3 to 5) consists of the actual price comparison for all considered consumers. The methodology used is a bottom-up approach, used to build up the energy cost wherever possible. As such, three main components are described: the commodity price, the network cost, and all other costs (i.e. taxes, levies, and certificate schemes). When it comes to residential consumers, the VAT also needs to be included. Chapter 3 first describes the dataset used in this study by setting the general assumptions employed, defining the consumer profiles considered and finally presenting an overview of the different zones identified in all five countries under review. While the Terms of Reference of this study set the consumer profiles' consumption volume and annual peak power, assumptions were taken to further complete our profiles' characteristics (e.g. contracted capacity, monthly peak, etc.), which are also listed in this section. Then, chapter 4 and 5 provide a detailed description of the deconstructed energy cost for electricity and natural gas, extensively describing the existing regulatory framework.

The **second section** of the report (described in chapters 6 and 7) presents the results per consumer profile, using a twofold approach: how do total energy prices in Belgium compare to the other four countries, and how the different components of the energy price relate to the observed results. While chapter 6 presents the results per consumer profile, chapter 7 draws general conclusions and introduces a first overview of the observed results in terms of competitiveness for Belgian residential, small professional and industrial energy consumers.

[24] FORBEG is the forum of the Belgian electricity and gas regulators. It is an informal consultation body consisting of representatives of BRUGEL, the CREG, CWaPE and VREG.

The **third section** of this study (described in chapter 8) addresses the efforts made by the government(s) and/or other instances to help vulnerable consumers pay their energy bills. This section particularly focuses on identifying social measures that are implemented by national governments and/or other instances, which are then quantified to derive the financial importance of one's energy consumption over its revenues. Through this, it is intended to illustrate the magnitude of countries' interventions to alleviate the energy cost weighting on vulnerable residential consumers.

The **fourth section** of this report (described in chapter 9) provides a detailed analysis of the competitiveness of the Belgian industry in terms of energy cost in the three Belgian regions. Particular attention is brought to the total energy cost for the industry on a macro-economic level where the aggregation of electricity and natural gas prices make up the total energy cost. This investigation is conducted for the five most important Belgian industrial sectors, which are identified through a preliminary exercise that can be found in section 3, and assesses their competitive advantages and disadvantages compared to industries from neighbouring countries, both at a national and regional level. Finally, several general conclusions and recommendations are formulated based on the report's insights.

A preliminary version of this report was submitted for review to the Belgian federal energy regulator (CREG), the regional energy regulators of Flanders (VREG), Wallonia (CWAPE) and Brussels (Brugel) as well as the national energy regulators of France (CRE), Germany (Bundesnetzagentur), the Netherlands (ACM) and the UK (OFGEM). This final report integrates all remarks formulated by those Regulatory Authorities.

3. Description of the dataset

3. Description of the dataset

General assumptions

We listed below general assumptions necessary for the overall comprehension regarding the selected consumer profiles and countries.

1. ***January 2023.*** This study gives an overview of the prices and tariffs of electricity and natural gas in January 2023 for Belgium, France, the Netherlands, Germany, and the UK. An exception has been done for residential consumers (RES & SSME) profiles for which the data was gathered in February 2023. As mentioned in the introduction, this exception is linked to the data collection process initiated at the end of January, where the price comparison tools in some countries/regions were already only displaying prices applicable as of February 2023. To avoid any bias when comparing the different countries/regions in scope of this study, it was decided to use the prices in force in February 2023 for residential profiles.

2. ***Economically rational actors.*** We assume the 13 selected profiles (8 for electricity and 5 for natural gas) are economically rational actors trying to optimise their energy cost when possible.

3. ***Exemptions and reductions.*** In various cases, we noticed the existence of – most of the time progressive – reductions or exemptions on taxes, levies, certificate schemes, or grid usage costs. Whenever economic criteria – such as exercising a well-defined industrial activity or paying a specific part of your company revenue as energy cost – are used to determine the eligibility for those exemptions and reductions, we do not present a single value but a range of possibilities as a result with a minimum and a maximum case. All the computation and graphs reflect the situation applicable in January 2023. Any changes that were happening afterwards were not included.

4. ***Commodity prices (B-SME and industrial consumers).*** All commodity prices are provided by the CREG, except for the electricity industrial consumers commodity price in the UK, which was provided by PwC based on Bloomberg market indices.

5. ***Electricity/Natural gas sales margin (B-SME and industrial consumers).*** While using the formula provided by the CREG to compute commodity prices, we do not add any sales margin – both for electricity and natural gas – to ensure better objectivity when comparing these different countries and consumers types. However, such a margin is *de facto* included as we consider offers, products and tariffs available on the natural gas/electricity market.

6. ***Natural gas pressure level and caloric value.*** As later exhibited, (some) industrial natural gas consumers are directly connected to the transport grid but are not connected to the same natural gas pressure level in every country (e.g. the Netherlands). We consider the most plausible pressure level for each country and client profile. We also consider the caloric value of natural gas for each country.

7. ***Exchange rates.*** For the UK, we systematically used the January 2023 average exchange rate to convert British Pounds to Euros, namely 0.8842 GBP/EUR (or 1.1309 EUR/GBP)[25]. For residential profiles, we used the February 2023 average exchange rate to convert British Pounds to Euros, namely 0.8855 GBP/EUR (or 1.1293 EUR/GBP) [26].

[25] European Central Bank
[26] ibid

8. ***Value Added Tax (VAT).*** We consider that VAT is deductible for professionals and is thus only considered for residential consumers (E-RES and G-RES). Besides, as the VAT is considered as a separate component for residential consumers, all prices reported in this document either exclude VAT or specifically mention its inclusion.

9. ***The UK.*** When mentioning the UK, we talk about Great Britain, including England, Wales, and Scotland, leaving aside Northern Ireland.

10. ***Auto-production*****.** In this study, we assume none of the selected profiles produces electricity on their own (on-site electricity production or domestic production). We therefore conclude that electricity consumption and invoicing correspond to one's electricity offtake.

11. ***Meter ownership.*** We assume that residential and small professional consumers do not own their specific meter. However, industrial consumers are considered to own their meter.

12. ***Unique contracts*****.** We assume that residential consumers have a contract with a supplier, including all costs.

13. ***Payment method.*** When multiple payment methods exist, the most common option is to be considered for residentials.

14. ***Reductions.*** When it comes to residential consumers, we do not consider reductions such as promotional offers or temporary offers. For industrial consumers, we consider certain exemptions or reductions as specified in the law, for instance.

15. ***Exclusion of products.*** As a rule, each product considered to compute residential consumers' commodity products should be available to all types of residential consumers. For instance, products unavailable during the period of the price comparison, products that require the acquisition of a share, products that require pre-financing, or products that are only available on certain conditions are excluded from the price comparison resulting in the selection of another product.

16. ***Digital meter owners*****.** If the bill is different for users with a traditional analogue meter compared to users with a digital meter, then only digital meter results are presented. This is for example applicable in Flanders for E-RES and E-SSME profiles.

17. ***Holders of a sectoral (energy efficiency) agreement.*** Some reductions are only applicable for holders of a sectoral agreement. Since we have already taken the assumption that our profiles are economically rational and would thus have a sectoral agreement if they qualify for the conditions (e.g. we presume British industrial consumers to be part of the climate change agreement, therefore leveraging energy efficiency and emission reduction to obtain tax reductions). As a reflection of each country's diversity of companies and of the sectoral agreements penetration rates, we explicitly specify which profiles are considered to qualify and therefore have a sectoral agreement.

Consumer profiles

In this study, we make the distinction between 3 main categories of consumers:

(1) Residential consumers;

(2) Small professional consumers;

(3) Industrial consumers.

Those different types of consumers are spread into 13 different profiles. We refer to E-RES (electricity) and G-RES (natural gas) as residential consumers, to E-SSME, E-BSME (electricity) and G-PRO (natural gas) as small professional consumers or as small and medium-sized enterprises, and to E0, E1, E2, E3 (electricity) and G1 & G2 as large industrial consumers.

All those profiles and their respected characteristics are detailed in Table 1 available on the next page.

Working assumptions:

(a) Figures regarding the contracted capacity, the annual peak and monthly peak were assessed based on hypotheses accepted by the steering committee of this study. While this study does not aim at stating these figures represent the exact values for all consumers, we assume they are plausible proxies necessary to compute prices across studied countries and regions. Figures are derived from values provided by the steering committee based on the below-listed hypotheses:

- **The contracted capacity** is assumed to equal 80% of the connection capacity with a 100% cos φ (up to E1) or 90% cos φ (from E2 to E4);
- **The annual peak** is assumed to equal 80% of contracted capacity for consumers connected to the distribution grid (E-RES to E1);
- **The annual peak** is assumed to equal 100% of contracted capacity for consumers connected to the transmission grid (E2 to E4) as the larger the consumption profile, the more stable ("baseload") the consumption is assumed. These consumers are more likely to precisely know their peak consumption and, therefore, sign for an identical contracted capacity;
- **The monthly peak** is assumed to equal 90% of annual peak for all countries/regions in scope of this study except for the E-RES and E-SSME profiles. For these profiles, the monthly peak is based on empirical data from 2022 provided by VREG. Since 2023, the network costs in Flanders for network users connected to the low voltage grid are based on the monthly peak. In other regions, the monthly (and annual) peaks do not impact the network costs for these consumer profiles.

(b) Whenever possible a distinction is made between day and night tariffs for profiles E-RES and E-SSME. This study assumes a day/night split of 1,6/1,9 MWh for E-RES and a 18/12 MWh split for E-SSME. For E-BSME profile the day/night split is 96/64 MWh, while 1.250/750 MWh for E0 and 6.250/3.750 MWh for E1 profiles.

Table 1: Consumer profiles for electricity

		E-RES (Electricity Residential)	E-SSME (Electricity Small SME)	E-BSME (Electricity Big SME)	E0 (Electricity 0)	E1 (Electricity 1)	E2 (Electricity 2)	E3 (Electricity 3)	E4 (Electricity 4)
Date	**Unit**	February 2023	February 2023	January 2023	January 2023	January 2023	January 2023	January 2023	January 2023
Annual demand	**MWh**	3,5	30	160	2.000	10.000	25.000	100.000	500.000
Consumption profile		-	-	-	Baseload (working days only)	Baseload (working days only)	Baseload (working days only)	Baseload (including weekends)	Baseload (including weekends)
Consumption hours eq.[27]	**h/year**	-	-	1.600	4.000	5.000	5.000	7.692	8.000
Grid operator		DSO (LS)	DSO (LS)	DSO (1-26 kV)	DSO (1-26 kV)	DSO (TransHS)	LTSO	TSO	TSO
Connection capacity	**kVA**	9,2	46,9	156	781	3.125	6.944	18.056	86.806
Contracted capacity	**kW**	7,4	37,5	125	625	2.500	5.000	13.000	62.500
Annual peak	**kW**	5,9	30	100	500	2.000	5.000	13.000	62.500
Monthly peak	**kW**	4,26	18	90	450	1.800	4.500	11.700	56.250
Metering		YMR	YMR	AMR	AMR	AMR	AMR	AMR	AMR

Information provided by the project steering committee

[27] These are the theoretical number of hours of electricity consumption of each consumer, obtained by dividing the annual demand by the annual peak.

Table 2: Detailed view of the connection level of consumer profiles for electricity per country

Profiles	Wallonia	Flanders	Brussels	Netherlands	France	Germany	The UK
E-RES	BT sans mesures de pointe HP/HC (<1 kV)	LS piekmeting (<1 kV)	BT (T09) (<1 kV)	Fase 1: 1 x 10 t/m 3 x 25 Ampere	BT ≤ 36 kVA	Niederspannung (<1 kV)	NHH Demand tariff – Domestic two rate (< 6 kV)
E-SSME	BT sans mesures de pointe HP/HC (<1 kV)	LS zonder piekmeting D/N (<1 kV)	BT (T09) (<1 kV)	3 x 80 Ampere	BT ≥ 36 kVA	Niederspannung (<1 kV)	NHH Demand tariff – Small non-domestic customer with two rate (<6 kV)
E-BSME	MT avec mesure de pointe (1-26 kV)	1-26 kV Hoofdvoeding (T03)	26-1 kV (TO3) Alim. Principale	Afnemers MS (1-20 kV)	HTA_1 (1 - 40 kV)	Mittelspannung (1 kV - 50 kV)	HH Demand tariff-HV HH Metered (6 - 22 kV)
E0	MT avec mesure de pointe (1-26 kV)	1-26 kV Hoofdvoeding (T03)	26-1 kV (TO3) Alim. Principale	Afnemers MS (1-20 kV)	HTA_1 (1 - 40 kV)	Mittelspannung (1 kV - 50 kV)	HH Demand tariff-HV HH Metered (6 - 22 kV)
E1	T-MT avec mesure de pointe (26-36 kV)	Trans-HS Hoofdvoeding (26-36 kV)	Trans MT (26-36 kV)	Afnemers Trafo HS+TS/MS (25-50 kV)	HTA_1 (1 - 40 kV)	Mittelspannung (1 kV - 50 kV)	HH Demand tariff-HV HH Metered (6 - 22 kV)
E2	LTSO (30-70 kV)	LTSO (30-70 kV)	LTSO (30-70 kV)	Afnemers TS (25-50 kV)	HTB_1 (50 - 130 kV)	Umspannung Hoch-/Mittelspannung (50 -110 kV)	EHV EDCM (22 - 132 kV)
E3	TSO (> 150 kV)	TSO (> 150 kV)	TSO (> 150 kV)	TSO (> 150 kV)	HTB_2 (130 - 150 kV)	Hochspannung (220 - 350 kV)	TSO (150 kV)
E4	TSO (> 150 kV)	TSO (> 150 kV)	TSO (> 150 kV)	TSO (> 150 kV)	HTB_2 (130 - 150 kV)	Hochspannung (220 - 350 kV)	TSO (150 kV)

Table 3: Consumer profiles for natural gas

		G-Res (Natural gas Residentials)	G-Pro (Natural gas Professionals)	G_0 (Natural gas 0)	G_1 (Natural gas 1)	G_2 (Natural gas 2)
Date		February 2023	February 2023	January 2023	January 2023	January 2023
Annual demand	MWh	23,26	300	1.250	100.000	2.500.000
Consumption profile		-	-	Baseload (working days only)	Baseload (including weekends)	Baseload (including weekends)
Consumption hours eq.[28]	h/year	-	-	3.000	5.000	8.000
Contracted capacity	kW	-	-	-	20.000	312.500
Metering		YMR	YMR	MMR	AMR	AMR

Table 4: Detailed view of the connection level of consumer profiles for natural gas per country

Profiles	Wallonia	Flanders	Brussels	Netherlands	France	Germany	The UK
G-RES	T2	T2	T2	G4: 0 t/m 10m³(n)/h	T2	G4	Consumption band < 73.200 kWh
G-PRO	T3	T3	T3	G25: 25 t/m 40m³(n)/h	T2	G40	73.200 < Consumption band < 732.000 kWh
G0	T4	T4	T4	G100: 40 t/m 65 m³(n)/h	T3	G100	Consumption band ≥ 732.000 kWh
G1	T6	T6	T5	TSO	T4	G1000	Consumption band ≥ 732.000 kWh
G2	TSO	TSO	TSO	TSO	TSO	TSO	TSO

[28] These are the theoretical number of hours of natural gas consumption of each consumer, obtained by dividing the annual demand by the annual peak.

Identification of industrial sectors

The macro-economic analysis carried out in this study intends to depict the industrial fabric of the Belgian economy as a whole and, more specifically, the economy of the Belgian regions: Brussels, Flanders, and Wallonia. Through this analysis, a certain number of relevant industrial sectors are determined that will be subjected to the natural gas and electricity price comparison.

There are two crucial objectives that justify the selection of sectors for which the price comparison is particularly of interest. First, it is to ensure consistency between the selected industrial profiles and the active industrial sectors. Second, it is to use this macro-economic analysis when assessing the impact of the described results for natural gas and electricity prices on the Belgian economy and its regions.

Throughout this study, we use a variety of macro-economic data relating to the manufacturing industry. This industry can be identified over numerous sectors as defined in the Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE[29].

The industrial fabric of a country can generally be grouped into two different parts:

1. The ***manufacturing industry***, including basic industries and all other industrial activities
    - Basic industries:

Table 5: Economic activities related to basic manufacturing industries with NACE classification

NACE code	Sector – Economic activity
13 – 15	Manufacture of textiles, wearing apparel, leather, and related products
16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastic products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals

    - Other sectors of the manufacturing industries:

Table 6: Economic activities related to other sectors of the manufacturing industry with NACE classification

NACE code	Sector – Economic activity
10 – 12	Manufacture of food products; beverages and tobacco products
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31 – 32	Manufacture of furniture; other manufacturing
33	Repair and installation of machinery and equipment

2. The ***extractive industry***, including industries extracting minerals from solid forms (e.g. coal and mineral ores), liquid forms (e.g. oil) or gaseous forms (e.g. natural gas).

Throughout this investigation, we solely focus on the manufacturing industry, considering the limited importance (in Belgium) and specific energy consumption profiles of extractive industries.

[29] NACE : Nomenclature des Activités économiques dans la Communauté Européenne

A four-step approach drives this exercise:

(1) First, we portray the Belgian national and regional industrial fabrics, focusing on employment, value added and specialisation criteria.

(2) Second, the energy intensity of these previously mentioned sectors is analysed to have a better insight into the energy cost role in the total cost structure among these sectors.

(3) Third, export intensity indicating the exposition level of certain industrial activities regarding international competition and potential relocation risk is exhibited.

(4) Fourth, we present the potential consumption reduction and energy efficiency using energy intensity data.

This study is the fourth edition of a multiple-year evaluation. To ensure consistency over the years, the selected sectors remain the same until a change of methodology is agreed with FORBEG and therefore remain the same as last year.

Main industrial sectors for the Belgian national and regional economy

In this part, we depict the relative significance of each sub-sector of the national manufacturing industry regarding value added and employment. This inquiry also considers the Belgian economy specialisation level at a national and regional scale in comparison with neighbouring countries. The manufacturing sectors belonging to NACE classification 10 to 33, in Belgium solely, but in Wallonia, Flanders and Brussels as well are under study. While on all sectors mentioned in Table 5 and Table 6 are under review, only a few, based on the highest relevant values, are displayed in charts to make it visually understandable.

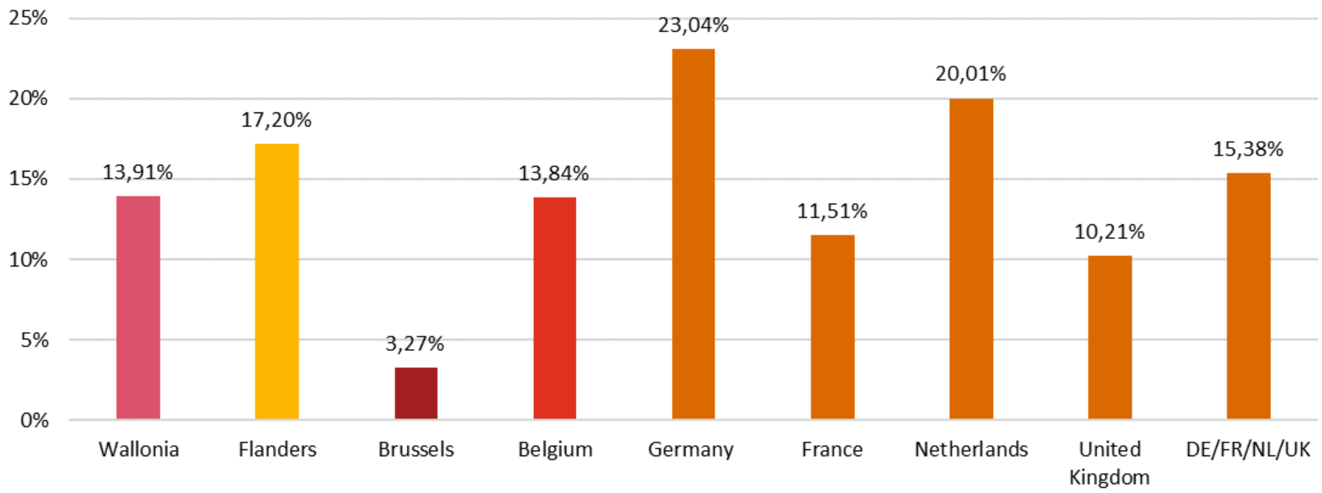
National accounts aggregated per industry coming from Eurostat dataset and the National Belgian Bank (NBB) serve as the basis for the analysis. The datasets used in this study are from 2016.

The importance of the manufacturing industry based on value added

The first investigation intents to determine the relative significance of the Belgian manufacturing industry (NACE 10 – 33) regarding value added. Therefore, we compare the value added of this sector with the total GDP of the regional and national economy. This analysis is benchmarked with the relative importance of the manufacturing industry in each of the neighbouring countries (Germany, France, the Netherlands, and the UK) and their weighted average[30].

Figure 1 displays higher relative importance of the previously mentioned manufacturing industry in Germany than in any other regions, followed by the Netherlands. Noteworthy, Flanders has the third-highest share of value added of the industry in the total GDP amongst all countries and regions from our study panel. At a regional level, only the manufacturing industry in Flanders has a higher "value-added/GDP ratio" than the average for neighbouring countries. Nevertheless, the manufacturing industry is less important in terms of value-added for the Belgian economy than for the average of neighbouring countries - partially due to the weight of the German economy.

Figure 1: Value added of the industry in total GDP



Source: Eurostat (2016 data), NBB (2016 data)

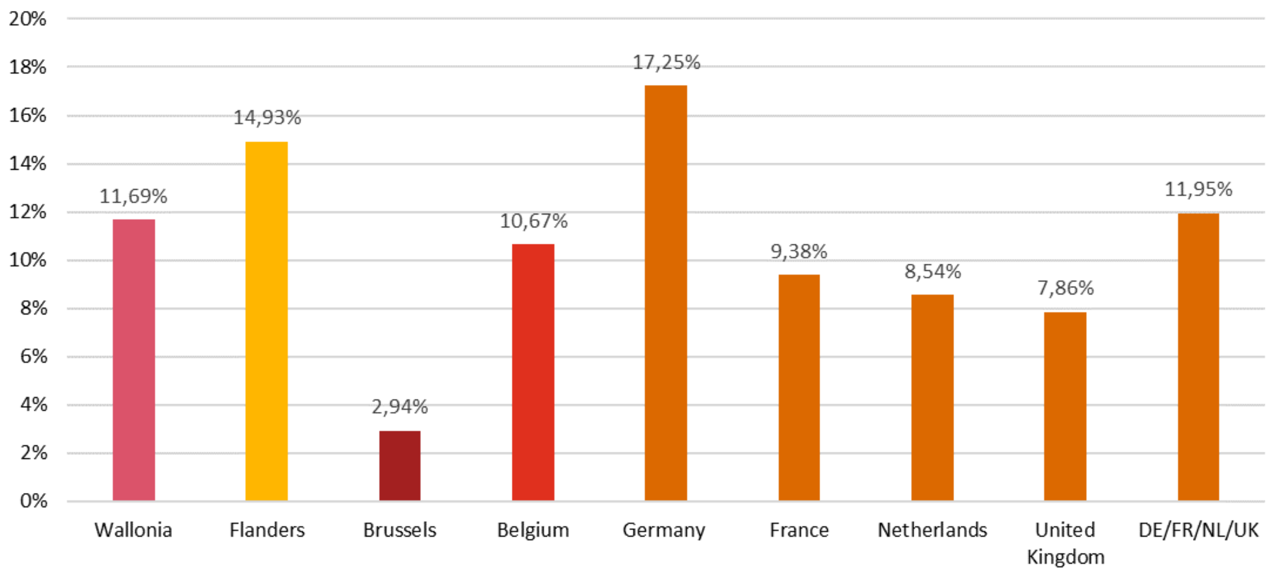
30 The average is weighed depending on the size of the different economies.

The importance of the manufacturing industry based on employment

The second analysis of this section intends to determine the relative importance of the manufacturing industry in Belgium with regards to employment. We, therefore, compare the employment generated by the previously mentioned manufacturing industry, i.e. NACE 10 to 33 with the employment of the Belgian economy, nationally or regionally.

When examining the relative weight of industrial employment between zones, similar results are obtained as in the previous analysis of the relative importance of manufacturing industry in terms of value-added. The only difference is that, when considering manufacturing industry, Wallonia is slightly above the Belgian average in terms of relative employment (Wallonia is very similar to the Belgian average in terms of relative value-added).

Figure 2: Importance of industry employment on total employment



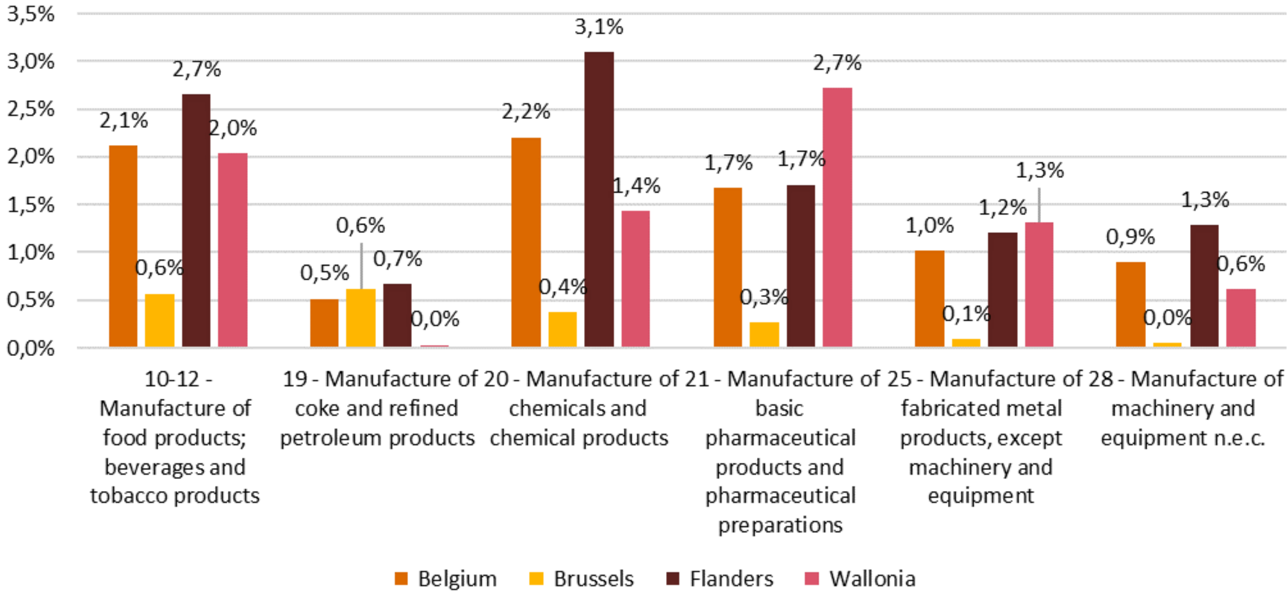
Source: Eurostat (2016 data), NBB (2016 data)

The identification of the most important manufacturing sectors based on value added

The following analysis aims to define the most important industrial sectors in terms of relative value added. Thus, for each sub-sector (within NACE codes 10-33), we compare the creation of value added to the total GDP of the economy (national or regional). The following figure presents the five main sectors of the manufacturing industry (NACE 10-33) in terms of their relative contribution to national or regional GDP. The sector NACE 19 (Manufacture of coke and refined petroleum products) is also considered due to its important weight for Brussels compared to other sectors for this region.

For the Belgian economy, these are the food and drink (NACE 10-12), the chemical (NACE 20)[31], the pharmaceutical (NACE 21), the metalworking (NACE 25) and machinery and equipment (NACE 28) sectors. It is interesting to note that these top five sectors for Belgium are also the top five in Flanders and Wallonia. Nevertheless, this analysis highlights important regional differences. Firstly, the chemical sector is important for Flanders in terms of value added (3,1% of total Flanders GDP). Second, the pharmaceutical industry is important for Wallonia (2,7% of the total GDP of Wallonia). It is also important to note that the petroleum products sector is almost non-existent in Wallonia. Thirdly, Wallonia also focuses on the food and drinks sector (2% of total Walloon GDP). It is also important to note that, when basic metals (no. 6 at Belgian level with 0,7%) and manufactured metals are added together (1%), their importance approaches the chemicals sector at Belgian level (most important sector with 2,2%).

Figure 3: Value added of most important sectors in terms of GDP



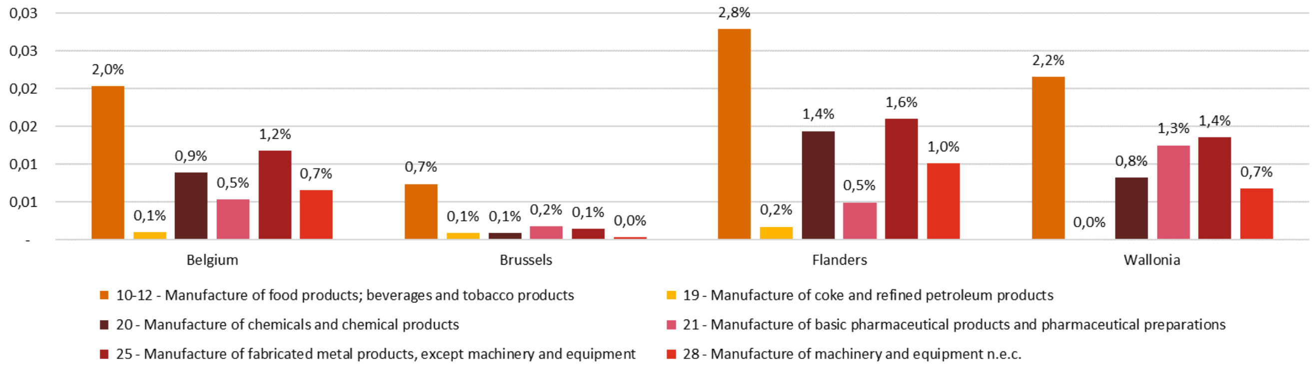
Source: Eurostat (2016 data), NBB (2016 data)

[31] One must be aware that the line between the petrol and chemical sectors might be thin. Therefore, we suggest the following definitions: sector 19 "includes the transformation of crude petroleum and coal into usable products. The dominant process is petroleum refining, which involves the separation of crude petroleum into component products through such techniques as cracking and distillation. This division includes the manufacture of gases such as ethane, propane and butane as products of petroleum refineries" (European Commission, 2020); sector 20 "includes the transformation of organic and inorganic raw materials by a chemical process and the formation of products. It distinguishes the production of basic chemicals that constitute the first industry group from the production of intermediate and end products produced by further processing of basic chemicals that make up the remaining industry classes" (European Commission, 2020).

The identification of the most important manufacturing sectors based on employment

The fourth analysis under this heading aims at identifying the most important industrial sectors in terms of relative employment. Thus, for each sub-segment (within NACE codes 10-33), we compare the level of employment with total employment in the Belgian economy. The regional level analysis is subject to the same computations. As depicted by Figure 4, the food sector (NACE 10-12) is the largest in terms of relative employment, followed by the metalworking sector (NACE 25), at both the national and regional level (except for Brussels). It is also interesting to note that the refining sector and the pharmaceutical sector are low labour-intensive, whereas the food and metal industries are high labour-intensive. The lower predominance of the chemical sector in Flanders and the pharmaceuticals sector in Wallonia compared to the previous analysis is also noticeable.

Figure 4: Share of employment in total employment for the main sectors (Nace 10 - 33)



Source: Eurostat (2016 data), NBB (2016 data)

The relative specialisation of Belgian manufacturing sectors compared to other countries

The final analysis in this section focuses on the specialisation indicator for the different sub-sectors of the manufacturing industry (NACE 10-33). The specialisation indicator results from the relative value added[32] comparison of each sector with that of the average of neighbouring economies[33]. When positive, the indicator highlights that the value added created by a specific sector in Belgium (or in one of its regions) is greater than the average value added created in neighbouring countries. Conversely, when a value for a specific sector is negative, the value added created by that sector in Belgium (or in one of its regions) is below the average for neighbouring countries. The specialisation indicator is calculated according to the following formula:

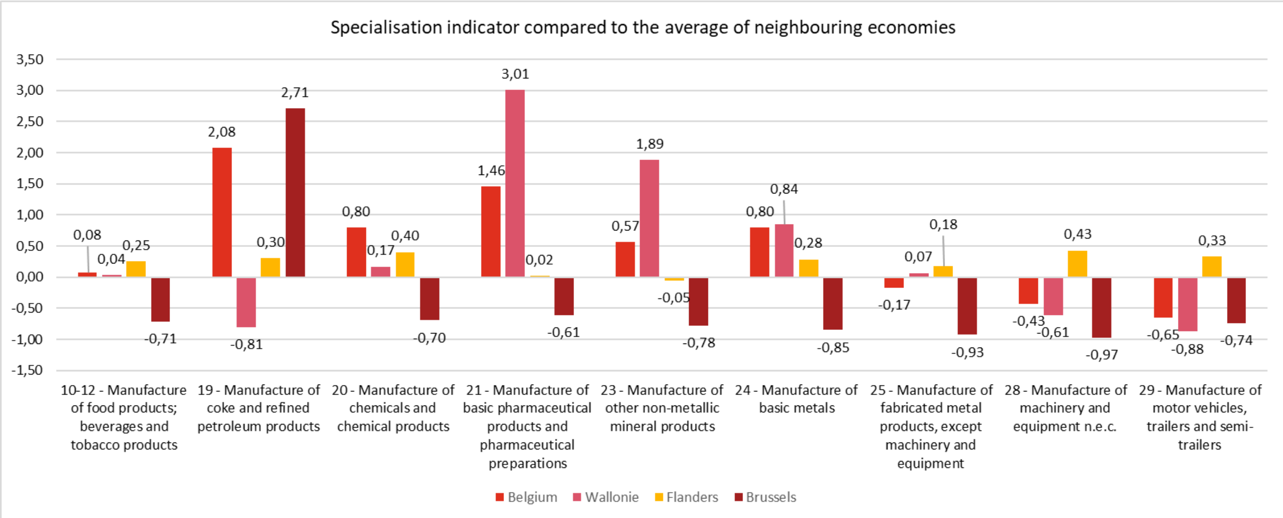
$$Specialisation\ indicator\ for\ Sector_i in\ Region_j = \left(\frac{Relative\ added - value\ of\ Sector_i\ in\ Region_j}{European\ average\ of\ the\ relative\ added - value\ of\ Sector_i} - 1\right)$$

[32] The relative value added is the absolute value added of a specific NACE sector over the absolute value added of all NACE sectors. The data is retrieved from NBB and Eurostat (2016 data).

[33] The European average throughout this section refers to the average of the neighbouring countries under scope in this report: Germany, France, the Netherlands and the United Kingdom.

Figure 5 shows that the basic metals (NACE 24), and the pharmaceutical sector (NACE 21) are the two most essential specialisations of the Belgian economy (specialisation indicator of 2,71 and 3,01 respectively). Of the top six sectors in terms of relative value added, three are not specialised. These are the fabricated metals (NACE 25), and the machinery equipment (NACE 28) and the motor vehicles (NACE 29) industries. It is interesting to note that the Belgian economy is more specialised in basic metals than in fabricated metal products, even though the latter is the more important sector in terms of GDP. At a regional level, Wallonia is (besides the pharmaceutical industry) highly specialised in other non-metallic minerals (NACE 23). At the same time, Flanders is (besides the chemical sector) highly specialised in the manufacture of machinery and equipment (NACE 28).

Figure 5: Specialisation indicator compared to the average of neighbouring countries



Source: Eurostat (2016 data), NBB (2016 data), PwC computations

Sectors with the highest energy costs in comparison with total costs and energy intensity

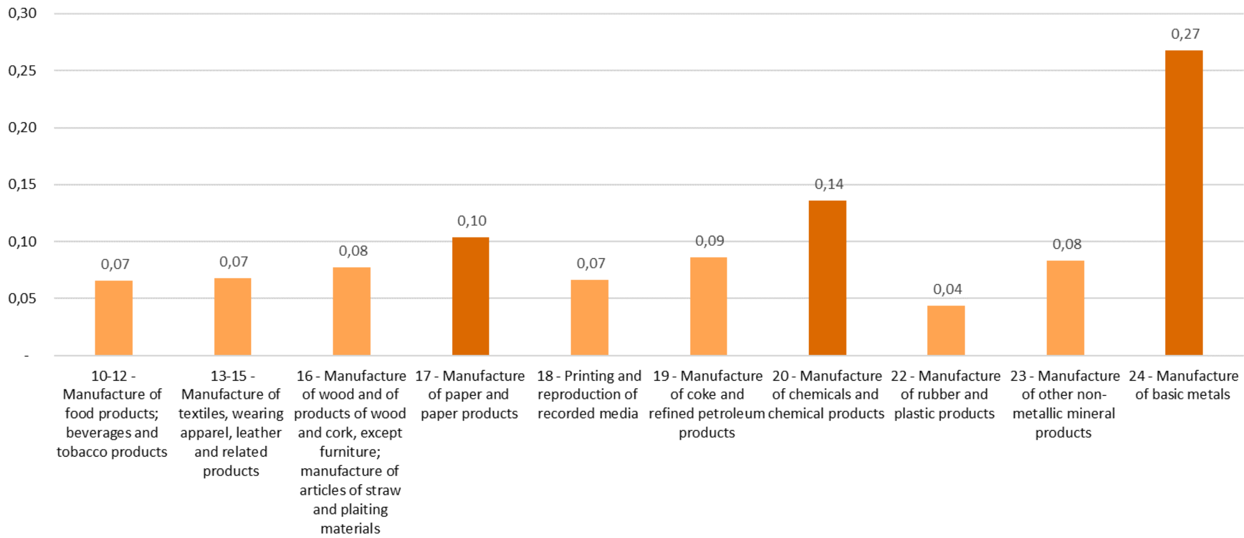
This section seeks to pinpoint the sectors of the manufacturing industry (NACE 10-33) with the highest energy costs. The first analysis is a cost approach which aims to identify the cost of energy (natural gas-electricity-steam) as part of the total value added. The second approach is product-based: we look at the consumption of natural gas and electricity and compare it with the creation of value added.

The first analysis compares the cost of energy (natural gas-electricity-steam) of each sector with the sector's value added. The analysis is based on the input-output tables of the Federal Planning Bureau with figures from 2015.[34] For this purpose, we identify the value of intermediate energy consumption (NACE 35) for each sector of the Manufacturing industry (NACE 10-33). We then divide this figure by the sector's value added.

The following figure (Figure 6) shows the sectors whose energy costs (natural gas-electricity-steam) account for more than 5% of their total value added. For several of the most critical sectors in terms of GDP, the cost of energy (natural gas-electricity-steam) is relatively low. Therefore, these sectors are not represented in the figure below. This is the case for the pharmaceutical (NACE 21), automotive (NACE 29), metallurgy (NACE 25) and machinery and equipment (NACE 28) sectors. Three sectors stand out as sectors where the cost of energy accounts for a considerable share of total value added. These are the paper (NACE 17), chemicals (NACE 20) and basic metals (NACE 24) industries.

[34] Theses input-output tables are published every 5 years.

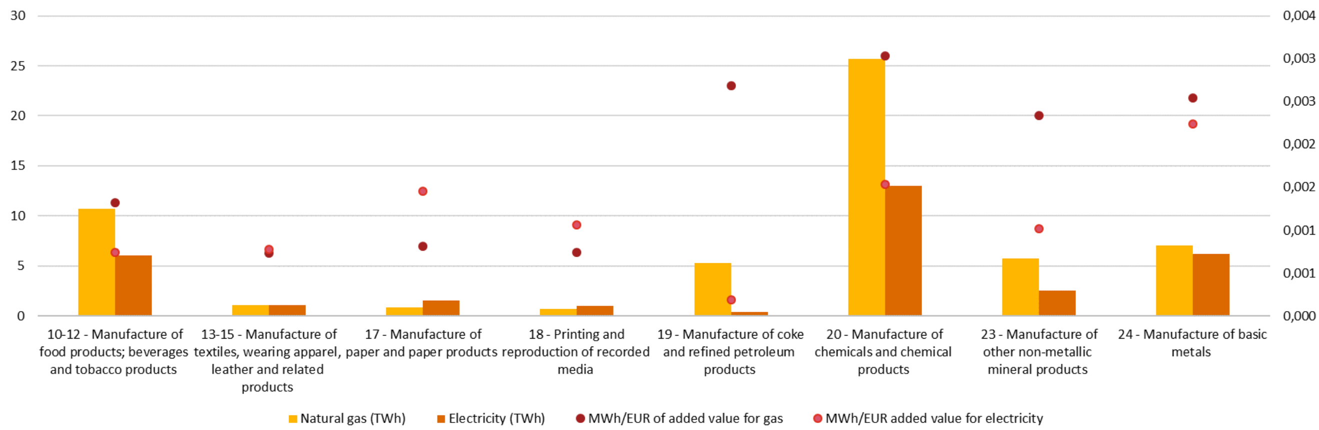
Figure 6: Cost of energy (electricity/natural gas/steam) as part of the total value added



The second analysis consists of identifying the most energy-intensive sectors of the Belgian economy, based on a product approach. Energy intensity is the result of dividing the energy consumption (in MWh) of each sector by its value added (in EUR). The data on the value added of each sector come from Eurostat, while the energy consumption accounts come from the Federal Planning Bureau.

In Figure 7, the Belgian chemicals sector (NACE 20) appears to be, by far, the highest energy consumer (natural gas and electricity) per value added followed by the food and beverages industry (NACE 10-12) and the basic metals sector (NACE 24). However, the highest natural gas consumer per value added is the chemicals sector (NACE 20) followed by the manufacture of coke (NACE 19) and metallic products (NACE 23 and 24). The highest electricity consumer per value added is the basic metal industry (NACE 24), followed by the chemicals industry (NACE 20).

Figure 7: Electricity and natural gas consumption compared with value added creation



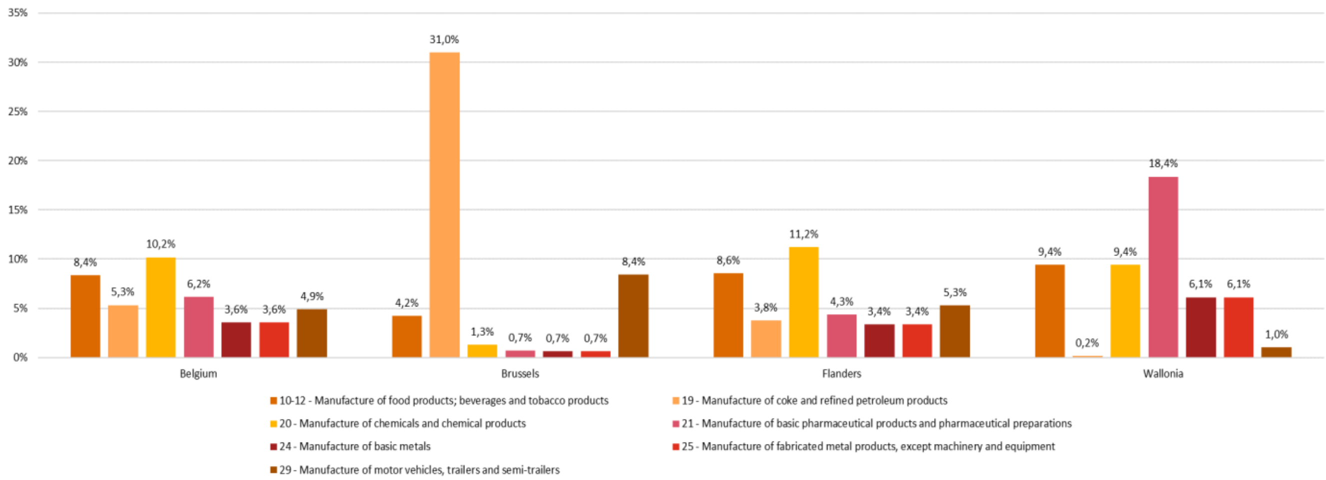
The textile manufacture (NACE 13-15), the paper manufacture (NACE 17) and the printing manufacture (NACE 18) have low energy consumption levels, and average consumption per value added. While the food and beverages industry (NACE 10-12) have relatively low average consumptions per valued added, similar to the paper manufacture (NACE 17), the manufacture of coke (NACE 19) displays the lowest average consumption per value added for electricity. Most industrial sectors have a higher natural gas intensity than electricity intensity. The only exceptions to this observation are the textiles (NACE 13-15), paper (NACE 17) and printing (NACE 18) industries, which have a higher electricity intensity than natural gas.

Sectors most exposed to international competition (including the relocation risk)

In this chapter, we look at the exposure of sectors to international competition, through analysing the relative share of exports to total exports for each industrial sector. Based on data published by the National Bank of Belgium, we determine the value of exports in each sector and its relative importance in the total exports of an economy (regional or national).

The first 7 manufacturing industry sectors with the highest relative share of exports in the total exports of the Belgian economy are, in descending order, the chemical (NACE 20), the food and beverages (NACE 10-12), the pharmaceuticals (NACE 21), the coking and refining (NACE 19), the automotive (NACE 29) and the base and fabricated metals (NACE 24-25) sectors. These sectors are, therefore, the most exposed to international competition.

Figure 8: Relative share of exports compared to total exports



The three regions fall under the analysis of these 7 most important sectors in terms of relative exports. The top 5 sectors (each with a relative share of exports >5% of the region's total exports) in Flanders and Wallonia are also among the top 7 sectors in terms of the relative share of exports in Belgium. In Flanders, the chemical sector has the largest relative share of exports (11% of the region's total exports). As far as Wallonia is concerned, the pharmaceuticals (NACE 21) sector stands out as the sector with the largest relative share of exports (18,4% of total regional exports) followed by the manufacture of food and drinks (NACE 10-12) and the manufacture of chemicals (NACE 20) both with 9,4%. In Brussels, the coking and refining sector (NACE 19) is by far the sector with the largest relative share of exports (31% of the region's total exports)[35].

However, this should be considered with caution. Assuming two sectors (A and B) whose exports represent an identical fraction of their sectoral production, if sector A is more substantial than sector B, then the implemented indicator (export of sector I over total exports) logically gives a result more significant for sector A as for sector B while being exposed to a similar relocation risk.

Following, the next figure (Figure 9) seeks to identify for which sectors of the Belgian economy there is a significant risk of relocation. To do so, we compare the value of exports of each sector with the value of the sector's gross output[36]. The more an economic activity depends on exports, the more it is exposed to a risk of relocation (regardless of other physical or geographical criteria). The production data for each sector come from the input-output tables of the Federal Planning Bureau. The data used in this study are from 2015.

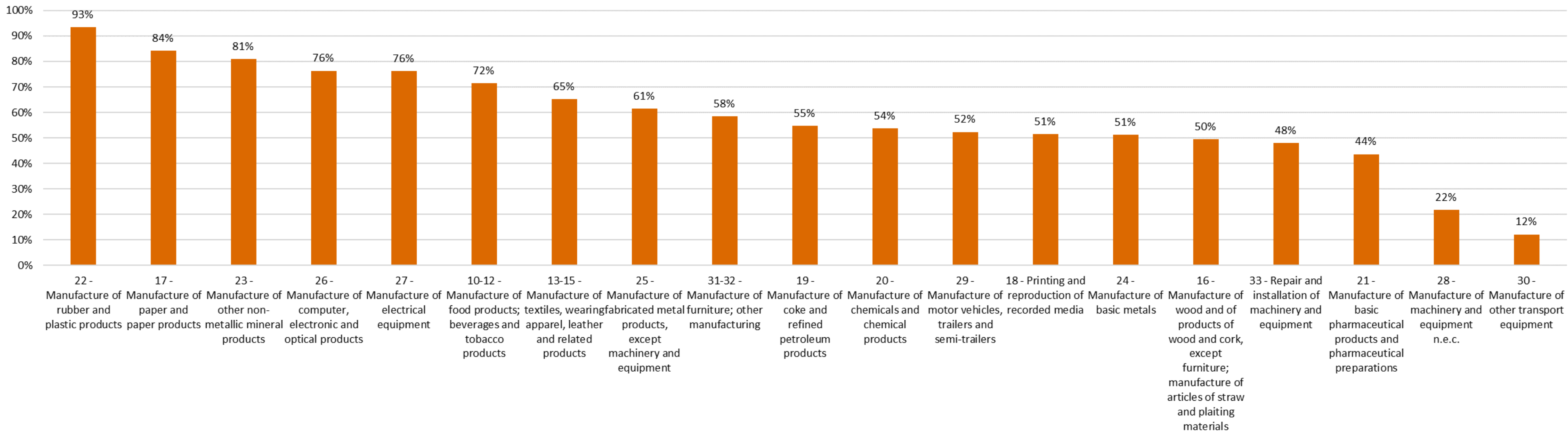
[35] This high share of oil exports certainly comes because of important imports realised in the first place. Petroleum products are the second most important goods imported via the port of Brussels (Brussels studies, 2017).

[36] According to the Federal Planning Bureau, gross output is a measure of an industry's sales or receipts, which can include sales to final users in the economy (GDP) or sales to other industries (intermediate inputs). Gross output can therefore be measured as the sum of an industry's value added and intermediate inputs.

The chart below shows that the sectors of Belgian manufacturing industry with the highest "exports to gross output" ratios are the plastics (NACE 22), the manufacture of paper (NACE 17), the manufacture of other non- metallic mineral products (NACE 23), the manufacture of electronic products (NACE 26), and the manufacture of electrical equipment (NACE 27). The sectors all have a ratio of exports to gross output of more than 75 %, meaning that these sectors are more likely to be at risk to relocate. Recent trends in the world economy, and more specifically on the European level, suggest providing more strategic autonomy in certain manufacturing sectors in order to avoid the relocations to unstable or politically hostile parts of the world[37].

Among others, woodworking (NACE 16), machinery equipment (NACE 28 and 33) and basic pharmaceutical products (NACE 21) are relatively less exposed to the risk of relocation. They each have a ratio of exports to gross output of less than 50%.

Figure 9: Exports compared with gross output



37 (European Union, 2020)

Sectors with the lowest potential in relation to consumption reduction (energy efficiency)

This section aims to identify the sectors of the Belgian economy, which may or may not have the possibility of significantly improving their energy efficiency in the short term. To that end, we compared the energy intensity of each sector of the Belgian manufacturing industry (based on the categorisation of industrial sectors in NACE 2008) with that of the same sectors in neighbouring countries (Germany, the Netherlands and France). The energy consumption (in MWh) per EUR of value added created for each sector measures the energy intensity. The data on the value added of each sector comes from Eurostat, while the energy consumption accounts come from the national statistical offices[38]. Noteworthy, not enough detailed data on energy consumption in the UK were available[39]. This analysis was carried out separately for electricity and natural gas.

Energy efficiency analysis

Sector 'i' of the Belgian economy (b) can be deemed to have the potential for improvement in terms of energy efficiency, compared to sector 'i' in another country (p), if it consumes more energy to produce the same unit of output.

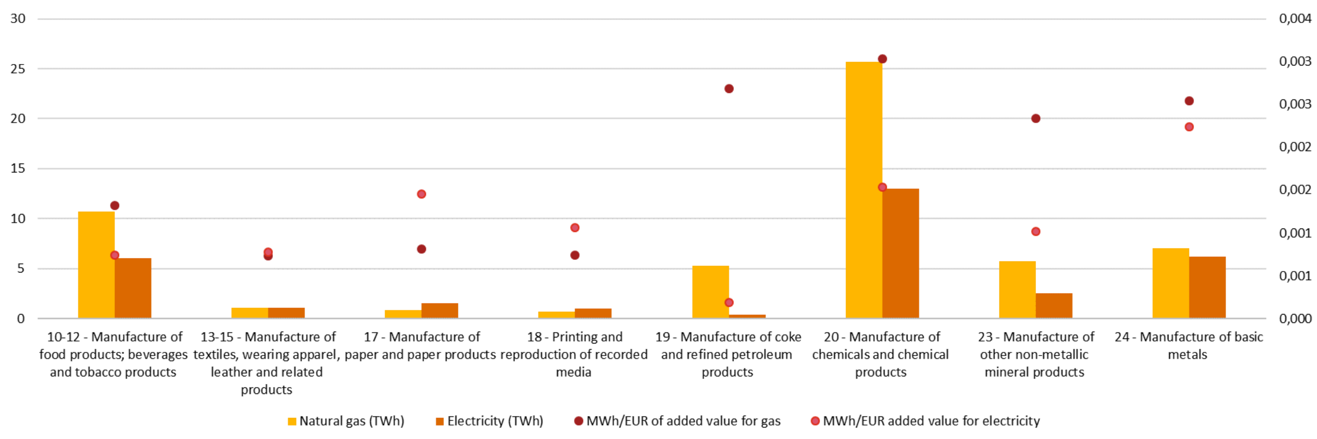
Energy intensity of sector 'i' of the Belgian economy > Energy intensity of sector 'i' of country 'p'

$$\frac{Energy\ consumption_b^i}{Added - value_b^i} > \frac{Energy\ consumption_p^i}{Added - value_p^i}$$

It is worth noting two caveats from a methodological point of view. First, macroeconomic data on a vast scale drives the analysis. It is therefore not possible to draw precise conclusions on a microeconomic basis that relate to a specific economic process. Secondly, we cannot establish a direct link between differences in energy efficiency at the macroeconomic level on the one hand and the capacity to improve energy efficiency on the other. Once again, we must take account of the fact that within sectors and countries, there are significant differences in terms of infrastructure, industrial processes and production that can explain these differences.

As a reminder Figure 10, also presented in section 2, shows that the two main energy-intensive Belgian sectors are the food and beverage industry (NACE 10-12) the base pharmaceuticals industry (NACE 20) - this is particularly the case for the energy intensity of natural gas. The Belgian wood industry is the least energy-intensive sector, as this figure shows when considering both electricity and natural gas.

Figure 10: Electricity and natural gas compared with the value-added creation



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[38] Federal Plan Bureau for Belgium, CBS Statline for the Netherlands, De Statis for Germany, and Insee for France.

[39] The energy intensity split between electricity and natural gas is not available.

Figure 11 and Figure 12 show that most Belgian sectors have the potential for improvement in terms of energy efficiency (electricity and natural gas) when compared with the weighted average of neighbouring countries (Germany, the Netherlands and France). This is the case for the food and drink (NACE 10-12), the textile (NACE 13-15), the printing (NACE 18) and the chemical (NACE 20) industries, both for natural gas and electricity consumption. These sectors could, therefore, potentially adapt to uncompetitive electricity and natural gas prices with increased energy efficiency.

However, some Belgian sectors do not have the possibility of significantly improving their energy efficiency. This is the case of the NACE 16 and 25 sectors, which respectively represent the wood, the paper, the chemical, and the fabricated metal manufactures. As Figure 11 shows, the energy efficiency gap is particularly large in electricity for basic metals (NACE 24), in natural gas for chemical (NACE 20). The higher electricity intensity experienced by France in many sectors greatly influences the high average for electricity in the neighbouring countries.

Nevertheless, Belgium is also below France, Germany, and the Netherlands and in terms of natural gas efficiency (Figure 12) for the paper (NACE 17) and plastic products (NACE 22). This means that, with uncompetitive prices, these sectors would be unable to adapt by significantly increasing their energy efficiency in the short term. Aside from the two previously mentioned industries, Belgium is above the average of neighbouring countries in terms of natural gas efficiency (Figure 12) for other sectors.

A third example is the Belgian base metals industry, which has an electricity intensity far below the average of neighbouring countries (Figure 11), but a natural gas intensity slightly above the average of neighbouring countries (Figure 12). The high average electricity intensity of the neighbouring countries is mainly due to the French base metals industry. In other words, this sector has the potential for short-term improvement in terms of natural gas efficiency but not electricity efficiency. This is also interesting because Figure 10 shows that the Belgian base metals industry is a relatively important natural gas consumer.

Notably, data is missing for the coke and refining sector (NACE 19). Moreover, Figure 12 does not present the extremely high natural gas intensity of the Dutch sector 0,03 MWh per EUR of value added). Data on the energy intensity of this sector was not available for France.

Figure 11: Electricity consumption compared to the value-added creation

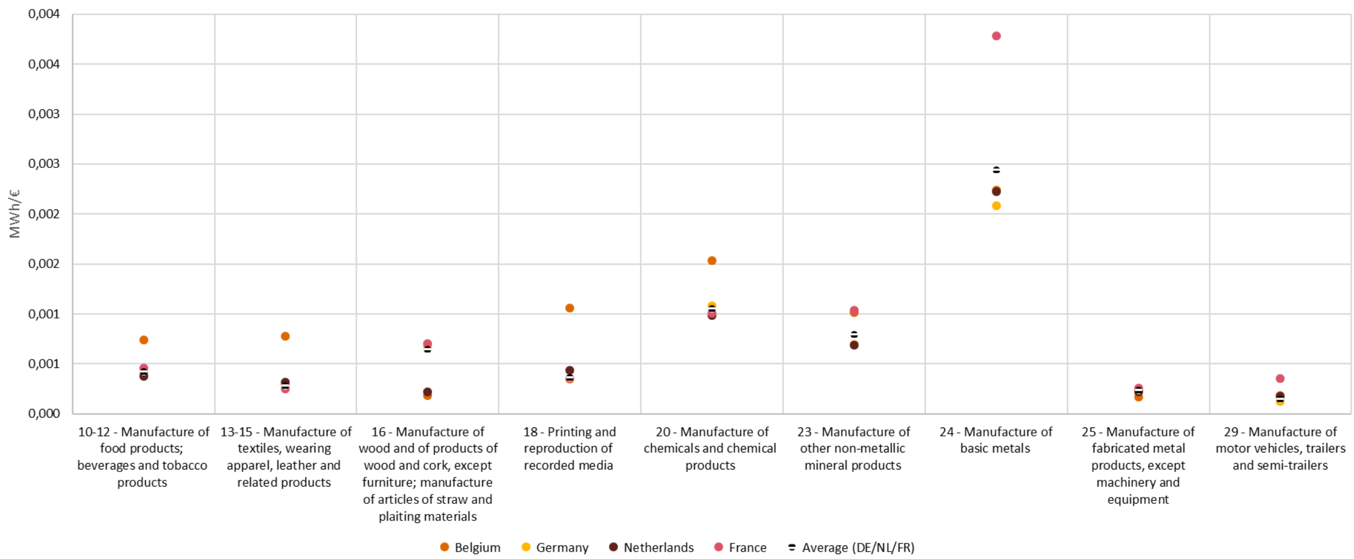
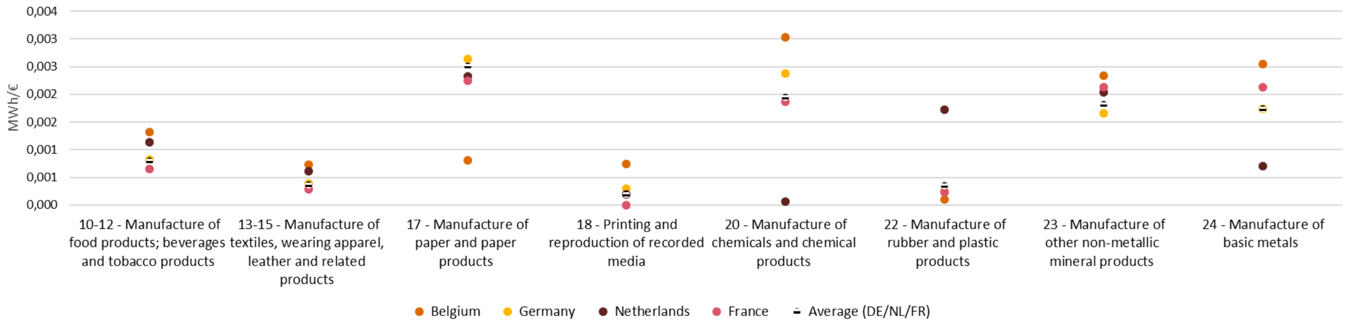


Figure 12: Natural gas consumption compared to the value-added creation



Selection of the most important sectors for our analysis

This section concludes our economic analysis by presenting a selection of the most important sectors related to electricity and natural gas prices and competitiveness.

The methodology we use to select the most important sectors is as follows:

First, we rank sectors from the highest to the lowest results with regards to the analysis: value added, employment, specialisation, cost of energy/value added, electricity consumption (absolute), natural gas consumption (absolute), electricity consumption per unit value added, natural gas consumption per unit value added, exports. In Figure 13, the smaller the number, the higher the ranking of the sector for the analysis. Next, we calculate the ranking score for each sector across all analyses, leading to a final ranking of each sector.

To illustrate this, we show a few examples. The second column illustrates the analysis we present in the section "The importance of the manufacturing industry based on value added", which concerns the value added of each sector in relation to the total GDP of the economy. We see that the most important sector in terms of relative value added is the chemical sector (NACE 20), which receives a score of 1 in Table 7, followed by the food and beverage industry (NACE 10-12), which receives a score of 2.

Another example concerns the comparison with neighbouring countries in terms of the potential for improving energy efficiency. For this analysis, we consider that the more energy efficient a sector is compared to the average of neighbouring countries, the less potential it has for improving energy efficiency. It is important to note several caveats regarding this approach. First, for some analyses, rankings for certain sectors are not available. This is mainly the case for analyses that depend on data based on the Belgian energy consumption accounts of the Federal Planning Bureau.

Secondly, for some analyses, some sectors benefit from the ranking position of another sector. This is notably the case for the pharmaceutical industry (NACE 21), which is often associated with the chemical industry (NACE 20); since for some analyses only combined data for NACE 20-21 codes are available. It also applies for the base and fabricated metal industries (NACE 24-25), which are sometimes analysed together due to the lack of available data.

Thirdly, only analyses related to national data have been considered. In other words, all sectoral classifications based on regional approaches have been excluded from this matrix.

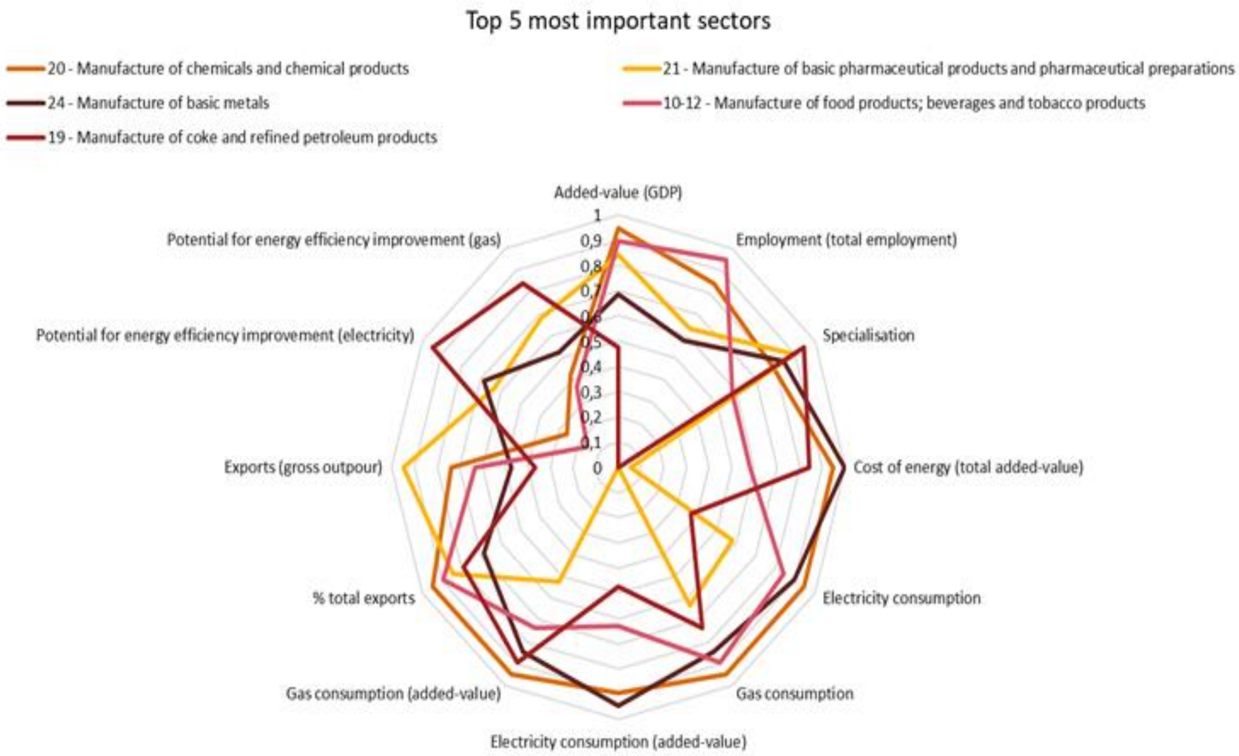
Finally, the calculation of the average score of all analyses is based on a simple average. No weight was given to any particular analysis, as all analyses were considered important in determining the most important sectors.

Table 7: Sectors ranking

NACE Code	Final sector ranking	Value added (GDP)	Employment (total employment)	Specialisation	Cost of energy (total value added)	Electricity consumption	Natural gas consumption	Electricity consumption (value added)	Natural gas consumption (value added)	% of total exports	Exports / gross output	Potential for energy efficiency improvement	Potential for energy efficiency improvement	Average score
NACE 20	1	1	3	4	18	1	1	2	1	1	5	14	11	5,2
NACE 21	2	3	7	2	1	8	7	19	9	3	1	7	6	6,1
NACE 24	3	6	8	3	19	2	3	1	3	6	10	6	9	6,3
NACE 10-12	4	2	1	8	11	3	2	7	5	2	7	16	12	6,3
NACE 19	5	10	19	1	16	12	5	10	2	4	12	1	3	7,9
NACE 23	6	7	6	5	15	4	4	5	4	10	15	12	8	7,9
NACE 25	7	4	2	12	6	9	10	14	13	7	11	4	5	8,1
NACE 28	8	5	4	15	4	10	11	13	14	8	3	13	13	9,4
NACE 17	9	16	17	10	17	5	8	3	6	12	13	5	2	9,5
NACE 13-15	10	13	10	6	13	6	6	6	8	11	4	17	14	9,5
NACE 29	11	9	5	19	9	11	12	11	11	5	2	11	10	9,6
NACE 22	12	8	9	11	10	14	14	17	19	9	16	2	1	10,8
NACE 31-32	13	14	11	14	8	15	15	8	12	14	8	15	15	12,4
NACE 18	14	17	13	9	12	7	9	4	7	18	18	18	18	12,5
NACE 16	15	18	14	7	14	18	19	12	16	16	17	3	4	13,2
NACE 26	16	12	16	16	3	16	16	16	18	13	6	10	16	13,2
NACE 33	17	11	12	13	2	13	13	9	10	19	19	19	19	13,3
NACE 27	18	15	15	17	7	17	17	15	17	15	9	9	7	13,3
NACE 30	19	19	18	18	5	19	18	18	15	17	14	8	17	15,5

With these four criteria in mind, we can conclude that the 5 most important sectors for our analysis are – ranked by importance–: the manufacture of chemicals and chemical products (NACE 20), the manufacture of basic pharmaceutical products and pharmaceuticals (NACE 21), the manufacture of basic metals (NACE 24), the food and beverage industry (NACE 10-12), the manufacture of coke and refined petroleum products (NACE 19). The next figure depicts the first five sectors. The larger the area covered by the sector, the higher the sector ranks in each of the analyses in this chapter.

Figure 13: Radar chart of the top five most important sectors



The radar chart depicts the ranking of the top five sectors, which will later be subjected to a more in-depth analysis. The higher the value on the chart (from 0 to 1), the higher the sectors rank based on the criteria. Those scores matter as they are critical to depict the importance of the manufacturing sectors to the Belgian economy. Our analysis indicates they are possibly profoundly impacted by electricity and natural gas prices differences with the neighbouring countries.

Electricity

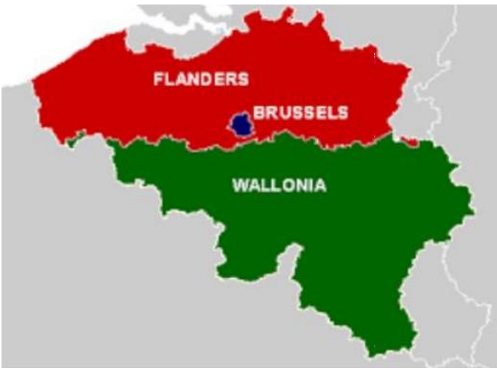
Electricity: Countries/Zone(s) identified

In this chapter, we aim at determining how a country or a region is organised as a territory. As such, we identify the transmission system operators (TSO) and distribution system operators (DSO) for each country and region. Furthermore, given that variations in prices may be due to local considerations, we specify whether a country is divided into zones for which results are presented individually rather than at national level.

Belgium

Belgium is divided into three regions, Flanders, Wallonia, and Brussels as mapped below.

Figure 14: Belgium national electricity market



Belgium's transmission grid is run by a single operator, Elia, which therefore covers the entire territory. While most charges imposed by Elia Transmission Belgium as TSO are homogenised across the country, differences appear at regional levels. Consequently, the three regions are individually evaluated as some of their characteristics vary from one another due to the existence of differing (i) distribution charges (regarding E-RES to E1) (ii) transmission charges (regarding E-RES to E1) and (iii) taxes, levies, and certificate schemes (regarding all profiles). Besides, while it is deemed that commodity cost for industrial consumers is interchangeable across Belgium, it is not the case when it comes to residential and small professional consumers.

Flanders

Distribution grids are the responsibility of each Belgian region. The table below displays a review of all DSOs in Flanders that operate on the regional distribution grid and their relative market share. Flanders counts 10 inter-municipal utility companies for electricity which are all operated by a single working company, Fluvius.

Table 8: Electricity distributed and market share for each Flemish DSO (electricity)[40]

DSO	Number of EAN connections (January 2023)	Market share (%)
Fluvius Antwerpen	598.022	16,67%
Fluvius Limburg	454.941	12,68%
Fluvius West	143.050	3,99%
Gaselwest	457.446	12,75%
Imewo	653.231	18,21%
Intergem	325.802	9,08%
Iveka	235.316	6,56%
Iverlek	557.002	15,53%
PBE	96.332	2,69%
Sibelgas	65.382	1,82%
Total	**3.586.524**	**100%**

As distribution tariffs vary from one DSO to another, we make use of a weighted average value for all 10 DSOs.

[40] Data provided by VREG, situation 1/01/2023.

Wallonia

When it comes to Wallonia, there are 11 DSOs, mostly operated by ORES (Ores Hainaut, Ores Namur, Ores Brabant Wallon, Ores Luxembourg, Ores Verviers, Ores Est, Ores Mouscron) and RESA as they account for more than 95% of the market[41]. The distribution tariffs differ between DSOs, and a weighted average is being computed for profiles from E-RES to E1. Even if ORES and RESA represent the DSOs with the broadest coverage, all DSOs in Wallonia are considered in this study. TRANS MT[42] is the highest voltage level in Wallonia. As in Flanders, the number of EAN connections for each DSO represents the backbone for the market shares computations. Results obtained this year for Wallonia are based on the latest quarterly data shared by the CWAPe, which does not take include the amount of EAN connections. The numbers shown in the table below represent the latest statistics computed.

Table 9: Market share for each DSO in Wallonia (electricity)

DSO	Market share (%)[43]
AIEG	1,37%
AIESH	1,10%
RESA	23,80%
ORES Namur	12,81%
ORES Hainaut	30,82%
ORES Est	3,15%
ORES Luxembourg	8,45%
ORES Verviers	4,29%
ORES Brabant Wallon	10,34%
ORES Mouscron	2,90%
Réseau d'Energies de Wavre	0,97%
Total	**100%**

Brussels

The DSO for electricity in Brussels is Sibelga, therefore accounting for 100% of the region's market shares. In 2021, Sibelga supplies 732.244 EAN connection points with electricity (latest data available).[44]

The table below exhibits the first impact caused by regional service obligations because of the grid connection levels. The regions can enforce public service obligations on grid operators running below or equal to 70 kV on their territory (repercussions on profiles E-RES to E2).

Table 10: Overview of voltage distribution to Belgian system operators

Voltage level	Operator in charge	Operator in Belgium
< 30 kV	Distribution System Operator (DSO)	Several
30 kV < x < 70 kV	Local Transmission System operator (LTSO)	Elia Transmission Belgium in the 3 regions
> 70 kV	Transmission System Operator (TSO)	Elia Transmission Belgium (federal)

Certificate schemes represent the second regional impact within Belgium that results from the local competence regarding renewable energy obligations matter on their territory. Flanders, Wallonia, and Brussels institute their specific green certificate scheme on all electricity consumers within the affected region (all profiles under review). In addition to assessing Belgium over the three regions, we consider different hypotheses: the consumer profiles E1 to E4 take part in an energy efficiency agreement, and all industrial profiles are affiliated with the sectoral NACE-BEL classification codes 5-33 (all industries).

[41] (CWaPE, 2020) – Bilan de la situation du marché de l'électricité pour l'année 2020 ; Gaselwest no longer operates in Wallonia since January 1st 2019.

[42] See Glossary, p.12

[43] Data received from the CWaPE on 27th of February 2023

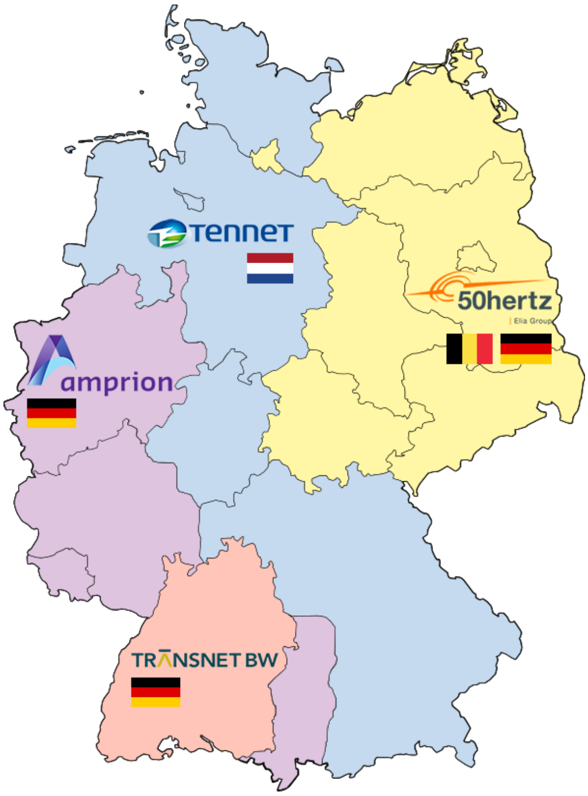
[44] (Sibelga, 2021)

Germany

Regarding Germany, consumers can participate in a single electricity market. We, therefore, assumed the commodity price is the same in the whole territory for consumers E-BSME to E4 who are highly likely to negotiate their electricity contracts with suppliers. With regards to profiles E-RES and E-SSME, the standard contract ("Grundversorgung") and its supplier depends on the region. Consequently, the commodity cost is determined per DSO region because the standard contract supplier is different.

In Germany, four different TSOs are currently active; the following figure shows their geographical spread.

Figure 15: Map of the German transmission system operators



- *<u>West Region:</u>* consists of Nordrhein-Westfalen, Rheinland-Pfalz and Saarland where Amprion is running the transmission grid.
- *<u>South-West Region</u>*: consists of Baden-Württemberg where Transnet BW is the TSO.
- *<u>Central Region:</u>* consists of Niedersachsen, Hessen, Bayern, Schleswig-Holstein where Tennet operates the transmission grid.
- *<u>East Region:</u>* consists of former East-Germany and Hamburg where 50Hertz is the local operator.

Regarding the geographical and economic eminence of these four areas (e.g. the smallest region has a similar population size than Belgium as a country), these zones are logically considered the same way we considered the three Belgian areas. We thus separately evaluate them.

The profiles E-RES to E2, similarly to other countries, also pay a distribution cost, which is further discussed in the section "Component 2 – network costs" for the residential profiles and "Component 2 – network costs" for the industrial profiles in Chapter 4 and 5 respectively. These four transmission zones appear to be the most accurate analysis regarding Germany as the country counts around 878 distribution system operators[45]. Considering the high number of DSOs in Germany, this increases complexity in observing German prices. Therefore, for the profiles E-RES to E2 under review (as they are connected to the distribution grid), we only take the prices from two predominant DSOs (a rural and an urban) for each of the transmission zones. An average distribution price is then derived from the two DSOs' existing prices and is used as a unique price for the transmission zone in question. The table below, summarises studied DSOs and their respective market shares (2019, latest data available).

[45] (Bundesnetzagentur, 2021)

Table 11: Market shares of German electricity DSOs (2019, latest data available)

TSO	DSO	Market share (%)
Tennet	Bayernwerk	70,43%
	SWM	29,57%
	Total	**100,00%**
50 Hertz	E-Dis	37,24%
	Stromnetz Berlin	62,76%
	Total	**100,00%**
Amprion	Westnetz	79,36%
	RNG-Netz 2 – Köln	20,64%
	Total	**100,00%**
Transnet BW	Netze BW	84,57%
	Stuttgart Netze	15,43%
	Total	**100,00%**

Contrary to other countries/regions the market shares of the DSOs are not used as weights because they are only a selection of the hundreds of German DSOs. The distribution tariffs of every DSO thus has the same weight. As regards taxes, levies and certificate schemes, neither do we observe regional differences for electricity consumers, nor even local taxes[46].

France

Concerning the electricity market, France is investigated as a single area. Concretely, the same commodity, distribution, transmission and taxes and levies prices apply to the whole territory. With regards to transmission, the RTE ("Réseau de Transport d'Electricité") is the transmission System Operator (TSO) who oversees the transmission network. In contrast, Enedis constitutes the largest French DSO with an approximate market share of 95%[47] (mainland). We thus consider this sole DSO for all consumer profiles connected to the distribution grid (E-RES to E1).

The Netherlands

Like France, the Netherlands is examined as a single zone. No regional differences appear when it comes to commodity costs, taxes, levies, and certificate schemes: it is a single electricity market, and energy is imposed on a national level.

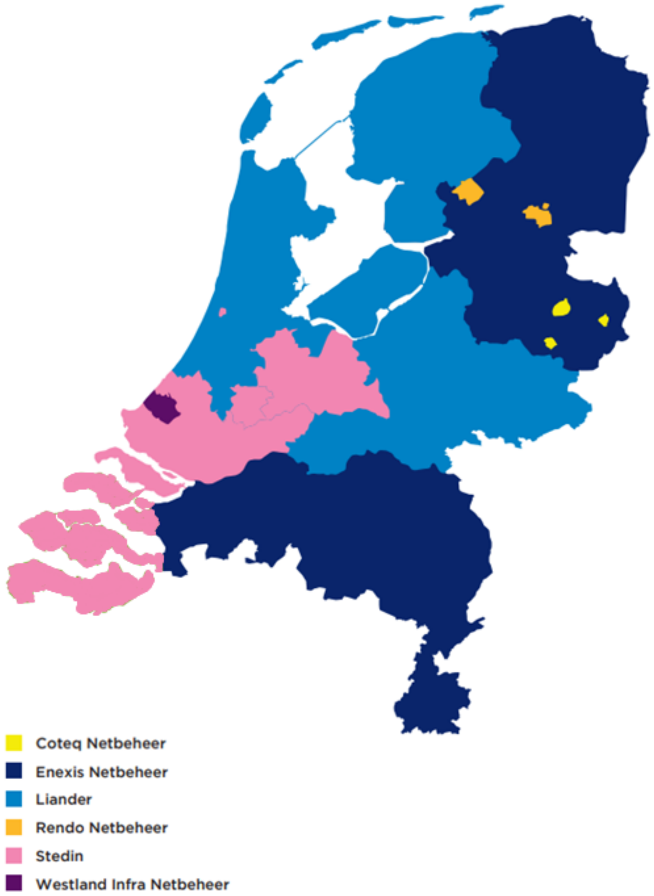
The Netherlands counts only one TSO – TenneT. For this reason, the same pricing methodology is applied throughout the national transmission grid. The network cost for the two largest consumer profiles – E3 and E4 – encompasses the transmission tariffs appointed by TenneT. Contrastingly, the Dutch profiles E-RES to E2 are connected to the national distribution grid that provides the entire network below the 110 kV voltage standard. Consequently, the network cost for profiles E-RES to E2 profiles dwell in the distribution tariff imposed by the DSOs.

The Netherlands' distribution network comprises six DSOs with different sizes and prominence, as the map below exhibits. Each DSO applies different and separate tariffs. In this case, distribution costs and transmission costs are aggregated in a cumulated fee.

[46] The Konzessionsabgabe is a local tax that applies to all electricity consumers connected to the distribution grid, but it is fixed on a national level and capped at one single rate for industrial consumers (*Konzessionsabgabenverordnung, § 1-2*). As that tax varies depending on the contract type or the city size, we consider the average paid concession fee.

[47] (Enedis, 2020)

Figure 16: Map of the Netherlands electricity distribution system operators



These six DSOs differ by the size, number, and type of clients. We thus expose a weighted average of distribution tariffs accordingly to the number of grid connections related to each DSO. The table below demonstrates an overview of the number of connections for all DSOs and their associated market share (2020, latest info available).

Table 12: Market shares and the number of connections for each Dutch DSO (electricity)

DSO	Market share[48] (%)
Liander	37,49%
Enexis	33,65%
Stedin	27,63%[49]
Westland	0,54%
Coteq	0,43%
Rendo	0,26%
Total	**100%**

When combining Liander, Enexis, and Stedin, these companies represent 95% of the market shares. Their prices subsequently have a higher impact on the weighted average distribution tariffs.

[48] The market share was given to PwC by the CREG (2020)

[49] Enduris merged with Stedin as of 1st January 2022, hence attributing to Stedin the market share that was previously owned by Enduris (2.56%) (Source: https://www.vemw.nl/Nieuwsoverzicht/2021-10-27-Tarievenvoorstellen-RNB-TenneT.aspx)

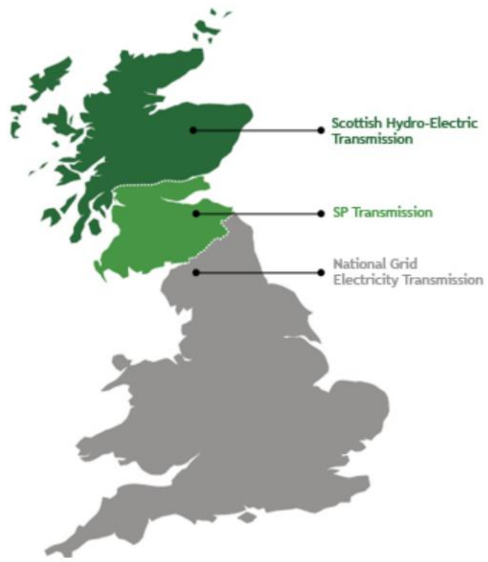
The UK

Similarly, to France and the Netherlands, the UK is analysed as a single area. Again, commodity costs, taxes, levies, and certificate schemes observe no regional variation as there is one single electricity market and taxes on a national level. The UK has three different transmission system operators: National Grid (for England and Wales), Scottish Hydro Electric Transmission (SHET), and Scottish Power Transmission (SPT).

Figure 17: The UK electricity distribution networks

In addition to these TSOs, six distribution system operators are currently functioning[50]. The TSOs and DSOs rate different tariffs in the fourteen zones that count the UK.

Figure 18: The UK electricity transmission networks



50 In addition to these large DSOs, the UK also has some smaller Independent Network Operators (IDNO's). These are not considered in this study.

Table 13: TSOs and DSOs in the UK zones

TSO	DSO	Zones
3	**6**	**14**
Scottish Hydro Electricity Transmission (SHE)	Scottish and Southern Energy Power Distribution	Northern Ireland
		Scotland
Scottish Power Transmission (SPT)	SP Energy Networks	Southern Scotland
		North Wales, Cheshire, and Merseyside
National Grid Electricity Transmission (NGET)	Electricity North West	North West
	Northern PowerGrid	Northern
		Yorkshire
	UK Power Networks	Eastern
		London
		South East
	Western Power Distribution	East Midlands
		Midlands
		South Wales
		South Western

Concerning network costs – transmission and distribution tariffs for the E-RES to E2 profiles–, we present, once again, a weighted average amount for the fourteen zones (2021 data, latest info available).

Table 14: Market shares of the UK electricity DSOs

DSO	Number of connections[51] (2021)	Market share (%)
Eastern Power Networks	3.664.189	12,18%
Southern Electric Power Distribution	3.110.203	10,34%
Western Power Distribution East Midlands	2.674.911	8,89%
Western Power Distribution West Midlands	2.505.140	8,32%
Electricity North West Limited	2.405.770	7,99%
London Power Networks	2.375.701	7,89%
Northern Powergrid Yorkshire	2.318.718	7,71%
South Eastern Power Networks	2.319.494	7,71%
SP Distribution	2.010.896	6,68%
Northern Powergrid Northeast	1.614.053	5,36%
Western Power Distribution South West	1.636.981	5,44%
SP Manweb	1.523.255	5,06%
Western Power Distribution South Wales	1.147.345	3,81%
Scottish Hydro Electric Power Distribution	785.183	2,61%
Total	**30.091.839**	**100,00%**

[51] Retrieved from each UK DSO annual report (2021 data, latest info available)

Natural gas

Natural gas: Countries/Zone(s) identified

In this chapter, we aim at determining how a country or a region is organised as a territory. As such, we identify the transmission system operators (TSO) and distribution system operators (DSO) for each country and region. Besides, given that variations in prices may be due to local considerations, we specify whether a country is divided into zones for which results are presented individually rather than at national level.

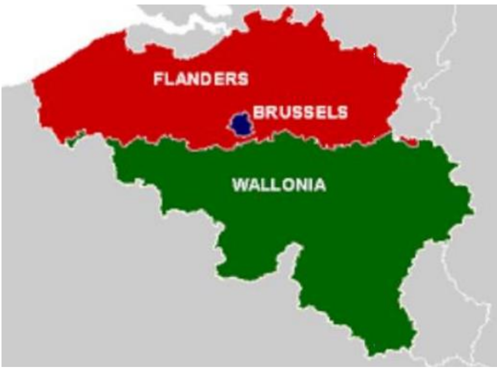
Belgium

No regional variations are observed in Belgium regarding transport and commodity costs. There is a single Transmission System Operator which is Fluxys Belgium, resulting in an equivalent transport price across the country.

The transport system is currently directly providing around 147 industrial clients (representing 187 sites), and we consider G2 as part of these direct connections[52].

In a similar fashion as for electricity, a distinct analysis is conducted for the three Belgian regions that are mapped out in Figure 19.

Figure 19: Belgium national natural gas market



Flanders

As exhibited in the consumer profiles, we consider that profiles G-RES to G1 (considered as T6) are connected to the distribution grid. Flanders counts 10 DSOs for natural gas distribution, 9 operated by Fluvius and one by Enexis[53]. Again, in this case, the distribution tariffs from the DSOs are assigned a weight based on the number of EAN connections for natural gas in the region.

Table 15: Market shares of Flemish natural gas DSOs[54]

DSO	Number of EAN connections (January 2023)	Market share (%)
Fluvius Antwerpen	445.947	18,96%
Fluvius Limburg	284.790	12,11%
Fluvius West	59.589	2,53%
Gaselwest	315.273	13,40%
Imewo	443.056	18,83%
Intergem	217.863	9,26%
Iveka	162.675	6,92%
Iverlek	374.965	15,94%
Sibelgas	48.286	2,05%
Total	**2.352.444**	**100%**

[52] None of these clients directly connected to the transport grid is located in Brussels.

[53] Enexis, active in the Belgian enclave of Baarle-Hertog (7,41 km²), is not considered in the study as not material

[54] Data provided by VREG, situation 1/01/2023.

Wallonia

Wallonia counts 6 DSOs which are operated by ORES and RESA[55]. The distribution tariffs are thus presented through an average value based on the number of EAN connections.

Table 16: Market shares of DSOs in Wallonia for natural gas[56]

DSO	Market share (%)
ORES Brabant Wallon	12,54%
ORES Hainaut	42,70%
ORES Luxembourg	1,73%
ORES Mouscron	4,68%
ORES Namur	5,91%
RESA	32,43%
Total	**100%**

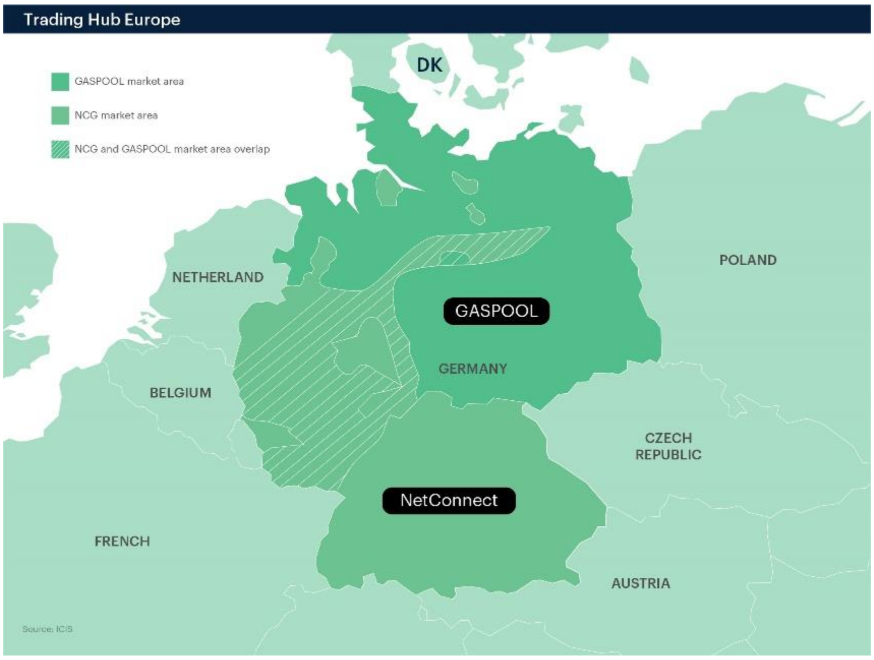
Brussels

As for Brussels, there is a single DSO – Sibelga – in this region. Inevitably, it represents 100% of the region's market shares. For 2021, Sibelga supplies 514.723 EAN connection points with natural gas (latest data available).[57]

Germany

Respecting commodity costs, we consider one market area in Germany, the Trading Hub Europe (THE), which is the result of the merger[58] between *Gaspool* and *Netconnect Germany (NCG)* since 1st October 2021. This area is composed of eleven different transmission system operators.

Figure 20: German national natural gas market



[55] Gaselwest no longer operates in Wallonia since January 1st, 2019.
[56] Data received from the CWaPE on the 27th of February 2023
[57] Data provided by Sibelga in 2021
[58] Source : https://www.icis.com/explore/resources/news/2021/09/27/10606635/topic-page-germany-s-gas-market-merger/

The eleven TSOs are the following: Gascade Gastranport, GTG Nord, ONTRAS Gastransport, Nowega, Gasunie Deutschland Transport Services, Bayernets, Fluxys TENP, GRTgaz Deutschland, Terranets BW, Thyssengas and Open Grid Europe.

As of the merger of the two market areas (Gaspool and NetConnect), we consider a single result for the German natural gas analysis. Respecting commodity costs, we demonstrate a single value for profiles G-PRO to G2 and compute a product portfolio for residential consumers G-RES that are determined by the DSOs selection we address further in this section.

Respecting network costs, transport prices are computed as the average exit tariffs of the eleven TSOs providing directly connected industrial consumers as a bedrock to evaluate the G2 profile tariffs. Other profiles are considered to pay for distribution, which already integrates transport costs in Germany. The basic contract or "*Grundversorgung*" for natural gas consumers depends on the regional DSO.

With over 700 DSOs[59] within the country, we once again present an average of the distribution tariffs of a large rural and a large urban DSO from each of the four previously defined market areas. The selected DSOs and their market share are detailed in the table below (2018, latest info available).[60]

Table 17: Normalised market shares of German natural gas DSOs (2018, latest info available)

DSO	Market share (%)
Bayernwerk	51,61%
SWM	48,39%
Total	**100,00%**
E-Dis	16,37%
NBB	83,63%
Total	**100,00%**
Westnetz	64,56%
RNG-Netz 2 – Köln	35,44%
Total	**100,00%**
Netze BW	84,32%
Karlsruhe Netz	15,68%
Total	**100%**

Contrary to other countries/regions the market shares of the DSOs are not used as weights because they are only a selection of the hundreds of German DSOs. The distribution tariffs of every DSO thus have the same weight. Considering the natural gas price applied to the selected profiles, the sole component that does not produce regional variation is the taxes and levies item.

[59](European Commission, 2019)

[60] These DSOs that were selected are slightly different from the DSOs that were selected for electricity. This is because geographical coverage of the distribution of electricity and natural gas are not identical within a certain area. So has Stromnetz Berlin been replaced by Netzgesellschaft Berlin-Brandenburg and Stuttgart Netze by Karlsruhe Netz.

France

France displays a single market area for natural gas, Trading Region France (TRF) since the merger of former market areas PEG Nord and TRS in 2018. Consequently, the French results are presented as a unique price zone. The country has two distinct transport operators, as depicted in Figure 21, which are:

i. GRTgaz is operating in the North, the South-East and the central region.

ii. TEREGA[61] is focusing in the South-West.

Network costs displayed by both TSOs are weighted based on their annual offtakes to come up with a single price. As for distribution costs, given that GRDF (Gaz Réseau Distribution France) supplies 95%[62] of the country's natural gas, it is considered as the unique DSO whose prices only are used in this study.

As it is the case in some other studied countries, French natural gas transport and distribution costs are integrated – except for consumers directly connected to the grid.

Figure 21: French national gas market

Residential and small professional natural gas contracts appear to be on six different price zones in France, established according to the distance between the nearest natural gas storage centre and the place of consumption, to pass on the difference in transport costs between cities[63].

The lack of information regarding the number of EAN connections per zone led us to select one area – the largest in terms of the number of cities covered (i.e. price zone 1)[64].

Concerning commodity prices, North and South regions are weighted based on their annual volume consumption. As no regional differences in taxes were noticed, France is considered as a single zone.

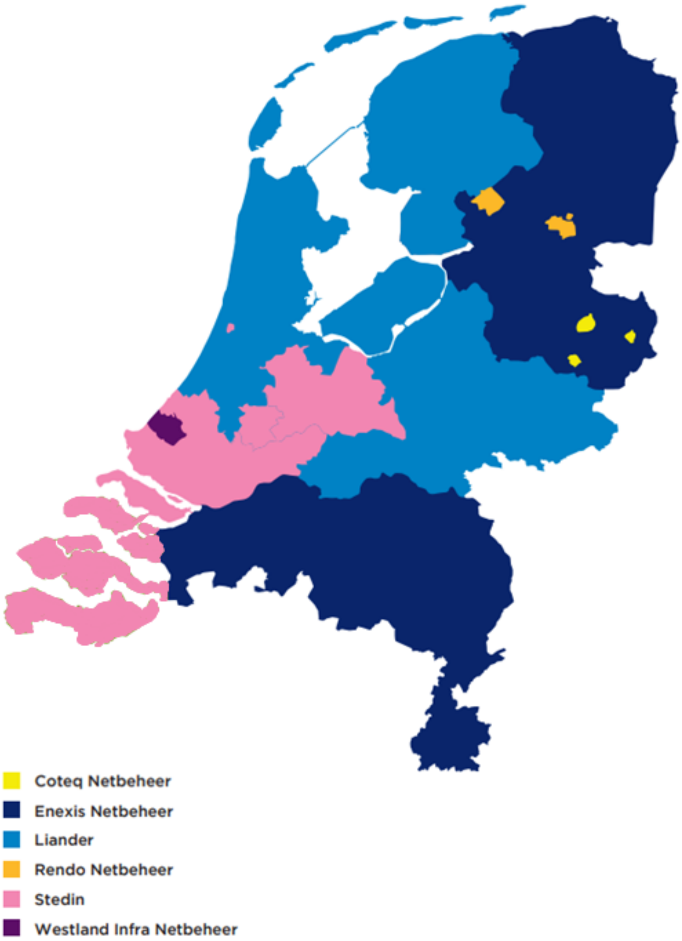
[61] TIGF became TEREGA in April 2018.
[62] (CRE, 2019); (GRDF, 2019)
[63] (Selectra, 2020)
[64] Ibidem

The Netherlands

In the Netherlands, suppliers can apply a regional surcharge depending on the distance of the region from Groningen for commodity costs, with ten different areas. In practice, the consulted suppliers (in the selection of underlying report) do not apply differentiated tariffs according to the region. Thus, we consider the commodity component to be the same within the country.

There is a single natural gas market (TTF) in the Netherlands, monitoring and managing all-natural gas entering the Dutch transport system. The TTF was established in 2003 to concentrate natural gas trading in a sole marketplace and offers a single Transmission System Operator – Gasunie Transport Services. The natural gas transport grid directly provides more than 300 industrial clients, assuming that profiles G1 and G2 are among these clients[65]. Hence, we display the Netherlands as a harmonised zone. However, Dutch natural gas distribution is ensured by six DSOs whose tariffs are weighted based on their respective number of EAN connections described below. Therefore, the Netherlands is treated as one zone, with weighted averages for the distribution tariffs (2019 data).

Figure 22: Map of the Netherlands natural gas distribution system operators



[65] Gasunie Transport Services is obliged by the Gas Act (Article 10, paragraph 6b) to provide a direct connection point when the applicant has a flow rate greater than 40 m³(n) per hour (equal to 350.400 m³/year). Considering a 9,77 kWh/m³ as disclosed by Gasunie Transport Services, we estimate that profile G1 has a flow rate of 2.047m³/h (= (2.500.000.000 kWh/9,77)/5000) and G2 of 31.986 m³/h (= (100.000.000 kWh/9,77)/8000). While our profile G0 could have been directly connected to the TSO based on minimum flow rate level (43 m³/h), we decided to assume this consumer remains connected to the distribution grid's highest-pressure category to further represent prices variations across consumer profiles.

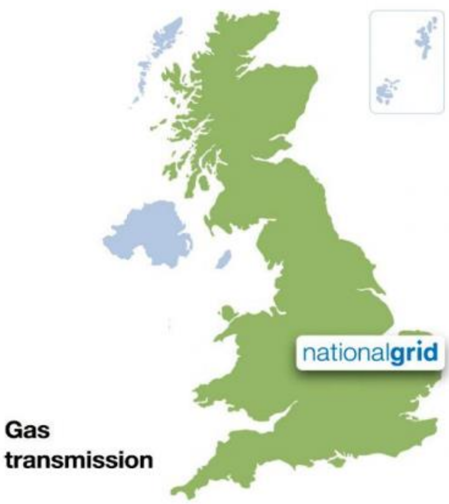
Figure 23: Market shares of Dutch natural gas DSOs

DSOs	Market share[66] (%)
Liander	34,42%
Enexis	31,62%
Stedin	29,82%[67]
Cogas Infra & Beh	1,96%
Rendo	1,44%
Westland Infra	0,74%
Total	**100%**

The UK

As in some other studied countries, a single zone is determined for the UK regarding natural gas, leaving out Northern Ireland given that there is a single natural gas market (NBP: National Balancing Point) in the UK. Besides, there is a unique natural gas transmission operator, known as *National Grid Gas plc*.

Figure 24: The UK national natural gas market



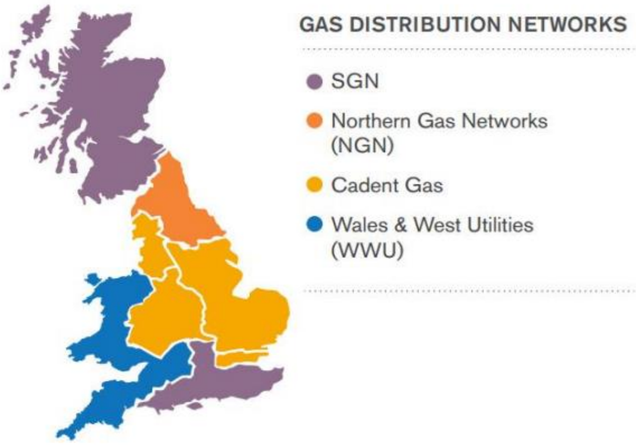
In addition to this unique TSO, one can find nine natural gas distribution networks, owned and managed by the four different operators:

i. **Cadent Gas (4):** West Midlands, North West England, East of England and North London;
ii. **Northern Gas Networks (1):** North East England including North East, North, West and East Yorkshire and Northern Cumbria;
iii. **Wales & West Utilities (2):** Wales and South West England;
iv. **SGN (2):** Scotland and Southern England, including South London.

[66] The market shares were given to PwC by the CREG (2019).

[67] As of 1st January 2022 Stedin merged with Enduris, hence attributing to Stedin the market share that was previously owned by Enduris (Source: https://www.vemw.nl/Nieuwsoverzicht/2021-10-27-Tarievenvoorstellen-RNB-TenneT.aspx)

Figure 25: The UK natural gas distribution networks



Additionally, Independent Gas Transporters owns and manages several smaller networks, which are not considered in this analysis.

Table 18 exhibits the British DSOs for which market shares could be identified. Whereas SGN and Wales & West Utilities both operate two DSOs, the specific market shares for these DSOs could not be retrieved. Nevertheless, prices displayed by SGN and Wales & West Utilities are identical for all their DSOs, which is why we only use market share at their global level. Consequently, only 7 DSOs are detailed in the table below. Due to the lack of accurate[68] information for each natural gas distribution operator, we used a rough estimate of the number of EAN connections from the operators' websites (2019 data).

Table 18: Market shares of the UK's natural gas DSOs

DSOs	Market share (%)
Scotland and Southern England	26,76%
East of England (part of Cadent Gas[69])	18,23%
Northern Gas Networks	12,25%
North West (part of Cadent Gas)	12,20%
Wales and West Networks	11,34%
London (part of Cadent Gas)	10,32%
West Midlands (part of Cadent Gas)	8,91%
Total	**100%**

British prices used in this study are weighted averages of prices found by each DSO.

[68] Apart from Cadent Gas, only a rough estimate of the number of EAN connections is available.

[69] In 2017, National Grid Distribution began business under a new brand, Cadent. Cadent Gas gathers four DSOs in charge of different regions.

Summary table on the number of zones per country

Table 19: Summary table on the number of zones per country

Country	Number of zones	
	Electricity	Natural Gas
Belgium	3	3
Germany	4	1
France	1	1
The Netherlands	1	1
The UK	1	1
Total	**10**	**7**

4. Residential and small professional consumers

4. Residential and small professional consumers

This chapter aims at providing an extensive introduction to the prices, price components and the assumptions taken for each country and region. It mainly focuses on residential (E-RES and G-RES) and small professional (E-SSME, E-BSME and G-PRO) consumers of electricity and natural gas. Before delving into the description of regional and national prices, we present the standard methodology used to assess the cost of the commodity.

Methodology

The following section gives more details regarding the implemented method for data collection to construct the European comparison of electricity and natural gas prices for residential and small professional consumers. This methodology only applies for profiles E-RES, E-SSME and G-RES as for other profiles it is deemed that:

- Larger consumers are more inclined to negotiate their contracts with suppliers directly, thereby being offered more tailor-made contracts.
- Comparison websites used for this methodology do not all accept values associated with our consumer profiles, which limits the consistency of the analysis across countries.

Defining the number of products

The market concentration of the retail market (HHI-index) determines the number of selected products for each of the studied areas. According to the HHI-index, the more concentrated a market is (large combined market share of few suppliers), the fewer products are considered. The less concentrated a market is (several suppliers with rather low market shares), the more products are deemed to reflect the market dynamics.

The following table illustrates the number of products selected based on HHI-index:

Table 20: Number of products according to the HHI-index

HHI-index	Description	Number of products
HHI ≤ 1.000	Little concentrated market	5
1.000 < HHI ≥ 2.000	Concentrated market	4
HHI > 2.000	Highly concentrated market	3

The HHI-index for each country and each utility was fetched from the 2022 Retail Markets Monitoring Report from the Council of European Energy Regulators, and this needs to be updated with each report release[70].

While this methodology provides a balanced perspective of the market prices, one must be aware that it does not entirely depict the market situation given that this exercise limits the number of chosen products. Nonetheless, the consistent methodology used does meet the objective of this study, as it compares the different countries energy prices retrieved according to the same rules.

[70] (CEER, 2022) With the exception of Germany, as German authorities do not report HHI indices. We thus used the HHI reported by the European Fact Sheets from the European Commission for Germany (European commission, 2014).

Selection of products portfolio

Again, based on the country-specific HHI-index for each utility, we determine several products to be selected. Before elaborating the following methodology, it is essential to define the term: standard product. The latter is considered, in this study, as either the product to which one is subscribed by default (i.e. when no specific action was taken to opt for a particular supplier product) and that secures the continuity of energy supply or the most common product from the market incumbent.[71] As introduced, several products – in addition to the standard product - are picked to constitute the portfolio.

The products were not chosen arbitrarily, but according to a specific following methodology:

- The first product to find is the standard product72 of the market incumbent;
- The second product to consider is the cheapest product on the market, without considering any lump-sum reduction. A price comparison tool73 is used to fetch the most affordable product in each region74;
- The third product to consider is the cheapest product of the market incumbent through the price comparison tool of each respective region. In some instances, these comparison websites may be not up to date and are presenting prices of contracts from a previous month75;
- The fourth/fifth product to consider is one/two of the cheapest products of the second-largest supplier that has not been considered yet.

[71] In Germany, the term *Grundversorgung* is used, and this product can be defined similarly as in Belgium. In France, the "Tarif bleu", which is regulated by the French government, was used. In the Netherlands, the *Modelcontracten*, which must be approved by the ACM and is thus also regulated, is the Dutch standard product. We took the "Model contract" from Essent, which is the most significant player on the Dutch market (as part of Innogy). In the UK, the standard product of the market incumbent, British Gas, was selected.

[72] The term "standard product" is not used in all the countries under examination so what we took as the standard product of all countries under the scope of this study might have some differences. Since this study starts from the Belgian perspective the Belgian terminology 'standard product' was taken. So as to know, from the Brugel and CWaPe price comparators, the standard product is defined as the "*product applicable to customers who have not signed a supply contract (case of substitute supply or default supply)*".

[73] Price comparison tools employed are specific to each country. The ones used are reported in the respective sections assessing the cost of commodity.

[74] A limitation of this method exists as it is possible that in some cases, suppliers take the new network charges into consideration in their products, which has an impact on the ranking of price comparison tools.

[75] It is possible that in some instances (i.e. in the beginning of the month), price comparison tools do not display the most recent information available at that moment in time. In those cases, prices of contracts from previous months could be considered.

Weight of each product within the product portfolio

The selected products are weighted as follows:

- The switching rate or SR (in %) for each utility in its respective country is the weight associated with the cheapest product. Depending on the country, a distinction is made between the switching rates for household and non-household consumers but without further specifying rates for different profiles of non-household consumers.
- The remaining share (100% - SR) is then used to weight the other products as follows:
  - If the remaining products are two products of the market incumbent, their weights are the remaining share (100% - SR) divided by two[76].
  - If other products from other market players are considered, the normalised market shares of the implicated market players are extrapolated to the remaining percentage (100% - SR)[77] .
  - In the case where more than one product from a specific supplier is selected, we attribute them the same weights (hence has the previously determined weight of the supplier divided by two)[78,79].
- Switching rates were fetched on the Retail Markets Monitoring Report by the Council of European Energy Regulators and make the distinction between residential and small professional consumers[80].

[76] Example: if the switching rate amounts to 20%, the remaining 80% are used to weigh the two remaining products of the market incumbent, which each account for 40%.

[77] Example: if the switching rate amounts to 20%, the remaining 80% are used to weigh the remaining products. If the market share of the incumbent is 40% and that of the next largest supplier is 20%, in a first step, their market shares are 'normalised' (respectively 40%/60% = 66,67% and 20%/60% = 33,33%). These market shares are then extrapolated to the remaining 80% (respectively 66,67*80% = 53,33% and 33,33*80%= 26,67%.)

[78] Example: In case the switching rate amounts to 20%, and the market incumbent of the previous example has two products selected in the mix, each of its products have a weight of 53,33%/2 = 26,66%

[79] An exception is made for the electricity profiles in France, as most clients still have a regulated product. Therefore, the market share of the regulated product is maintained, and the third product is 100% - the switching rate – the market share of the regulated product.

[80] Yet, the Netherlands do not publish separate data for residential and non-residential consumers. For this country, the combined annual switching rate was therefore used as published by the Energy fact sheets from the European Commission. An exception was also made for France, the SR comes from the report "Le fonctionnement des marchés de détail français de l'électricité et du gaz naturel » which is updated every year.

Electricity

Electricity: Detailed description of the prices, price components and assumptions

For all countries under review, this section details:

1. **Commodity costs** for profiles E-RES, E-SSME and E-BSME;
2. **Network costs** for profiles E-RES, E-SSME and E-BSME;
3. **All other costs** for profiles E-RES, E-SSME and E-BSME.
4. **VAT** for profile E-RES

Profile	Consumption (kWh)	Connection capacity (kVA)[81]
E-RES	3.500	9,20
E-SSME	30.000	46,90
E-BSME	160.000	156,00

Due to the current market situations, a very limited selection of fixed tariffs products is available in the offerings of electricity and gas providers, for all countries in the study. This situation differs from the last three occurrences of this series of studies. The result is the use of a dataset that only contains variable tariffs. This could partly account for parts of the evolutions observed this year.

Belgium

Contrary to what is observed in other countries, the Belgian electricity suppliers have quite transparent price sheets. Commonly most of the current price sheets can be found online on each providers website. The price sheets also give a good overview of all charged components.

Component 1 – the commodity price

In 2021[82], the HHI of the retail market in Belgium was over 2.000, and according to the methodology, this entails that we consider only three products: the standard product, the cheapest product of the market incumbent, and the cheapest offer on the market. The switching rate in Belgium is 24,76% for households (E-RES) and 21,6% for non-households (E-SSME)[83]. The products of the market incumbent for E-RES thus each weigh (100%-24,76%)/2 or 37,62%. For the E-SSME, the two products of the market incumbent each weigh 39,20%, (100%-21,6%)/2.

Table 21: Profile weights depending on the Belgian product

Product	Weight E-RES	Weight E-SSME
Standard product of market incumbent	37,62%	39,20%
Cheapest product on the market	24,76%	21,60%
Cheapest product of the market incumbent	37,62%	39,20%
Total	**100%**	**100%**

The table below gives an overview of the selected products, based on the consumption and characteristics of the profile, per region and their annual cost. To choose these products price comparison websites of the respective regional regulators were used: https://vtest.vreg.be/ for Flanders, www.compacwape.be for Wallonia and www.brusim.be for Brussels. All prices reported are VAT excluded and reflect the prices for fixed or variable price contracts observed in February 2023 (See *3. Description of the dataset*). In the latter case, it is important to note that the presented prices are merely estimates of the annual price as the price comparison tools do not know what the exact price will be for the coming year.

[81] Methodology to assess connection capacity of each profile can be found in section 3.2. Consumer profiles.
[82] (CEER, 2022)
[83] (CEER, 2022)

It is important to note the presentation of prices has changed in Belgium for this year's report, as we now present figures using forward-results instead of prices reflecting the past.[84]

Table 22: Annual cost of selected products for profile E-RES in Belgium

Region	Supplier – Product	Contract type (fixed/variable)	Fixed component (EUR/year)	Price for peak consumption (EUR/year)	Price for off-peak consumption (EUR/year)
Brussels	ENGIE - Electrabel Easy Indexed	Variable	55,00	501,08	409,08
	ENGIE - Electrabel Direct	Variable	24,85	396,97	321,36
	TotalEnergies - Pixel	Variable	23,58	415,37	367,66
Wallonia	ENGIE - Electrabel Easy Indexed	Variable	55,00	501,08	409,08
	Luminus - Basic Electricité	Variable	20,00	384,40	325,66
	ENGIE - Electrabel Flow Indexed	Variable	50,00	393,26	313,86
Flanders	ENGIE - Electrabel Easy Indexed 1 jaar	Variable	55,00	501,09	409,07
	Energie.be - Elektriciteit	Variable	33,02	298,36	354,30
	ENGIE – Direct Indexed 1 jaar	Variable	24,85	396,98	321,37

Table 23: Annual cost of selected products for profile E-SSME in Belgium

Region	Supplier – Product	Contract type (fixed/variable)	Fixed component (EUR/year)	Price for peak consumption (EUR/year)	Price for off-peak consumption (EUR/year)
Brussels	ENGIE - Electrabel Easy Pro Indexed	Variable	53,35	5.447,24	2.553,60
	TotalEnergies – Digital Variable Green Power	Variable	60,00	4.289,32	1.971,95
	ENGIE - Electrabel Flow Pro	Variable	55,0	4.213,84	2.016,10
Wallonia	ENGIE - Electrabel Easy Pro Indexed	Variable	53,35	5.447,24	2.553,60
	OCTA+ - Clear	Variable	50,00	3.977,34	2.030,93
	ENGIE - Electrabel Flow Pro	Variable	60,00	4.289,32	1.971,95
Flanders	ENGIE - Electrabel Easy Pro Indexed 1 jaar	Variable	53,35	5.447,24	2.553,60
	Energie.be - Elektriciteit	Variable	60,00	3.481,38	2.320,92
	ENGIE - Electrabel Flow Pro	Variable	60,00	4.289,32	1.971,95

While this methodology provides an objective view of the market situation in Belgium, one must be aware that it does not provide a full overview of market prices. In fact, only three products were considered to depict the Belgian commodity prices, whereas the formulas used by the energy providers to calculate the indexed products might differ among the countries under review[85].

[84] This remark is also relevant for natural gas

[85] Depending on the country, indexed products might be calculated with forward or with backward looking prices. For example. in Belgium the variable product by Engie is indexed quarterly with an indexation parameter based on the arithmetic mean of the daily ICE Endex quotations during the quarter preceding the quarter of supply.

The commodity price for the E-BSME profile was not extracted from a comparison website but calculated by the CREG according to the following formula.[86] Commodity prices computation rests on market prices and describes the cost of electricity for industrial consumers as of January 2023. CREG used the ICE Endex CAL and the Belpex DAM as national indexes for the computation. For the E-BSME profile, CREG did not include weekend hours of Belpex DAM.

$$\text{Commodity price} = 36.5\%\, CAL\, Y_{-1} + 27.4\%\, CAL\, Y_{-2} + 21.4\%\, CAL\, Y_{-3} + 8.2\%\, Qi_{-1} + 4.2\%\, Mi_{-1} + 2.3\%\, Belpex\ DAM$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two years ahead forward price in 2021
CAL Y_{-3}	Average three years ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

Component 2 – network costs

Transmission cost

All residential profiles reviewed in this study are subject to transmission tariffs. In Belgium, the transmission tariffs are billed by the Belgian TSO, Elia, to the local DSOs. These tariff components are then billed to the end-consumer. As there exist grid network losses and some production supplied to the network, the tariffs transferred to the end-customer are not exactly similar to the one billed to the DSOs by Elia. The table below synthesises the components per region:

Table 24: Network cost components per Belgian region

Brussels	Wallonia
1. Transmission costs	**1.** Tariffs for the management and the development of the grid infrastructure
2. Tariffs for network losses (E-BSME to E4 only)[87]	**2.** Tariffs for network losses (E-BSME to E4 only)

As from 2023, Flanders shows a different picture as the transmission costs are integrated in the distribution network tariffs. They can be found under the following two labels on the tariff sheets:

1. Tariff for use of the grid;
2. Tariff for other transmission costs.

[86] The equations are based on an analysis of all Belgian consumers with a yearly usage higher than 10 GWh, which was performed by the Belgian regulator. For 2021, ratios used in the formula were determined as being the average coefficients over three years (2016 to 2018). For the sake of consistency, the coefficients will remain the same for the initial study and the yearly updates until 2023.

[87] We consider that such tariff only applies to E-BSME as commodity is not computed based on a supplier's product, which would cover network losses through its costs. Network losses on the federal transmission grid (380/220/150 kV) are a separate and additional component to the transmission tariffs but are not considered as transmission tariffs as such. Suppliers usually bill these costs as a percentage (fixed every year by the TSO) of the commodity cost. While the costs associated with network losses is not a transmission tariff as such, it is deemed to be a part of the 2nd component in this study.

Regarding transmission tariffs, regional regulators also differ in terms of timing of tariff adoption. The table below sets out the different adoption dates per region:

Table 25: Adoption date of new tariffs by regional DSOs in Belgium (Residential and small prof. consumers)

Name of the DSO	Effective date
BRUGEL	1 January 2023
CWaPE	1 March 2022

In Flanders, as explained above, there are no more explicit transmission tariffs for distribution network users as from the 1st of January 2023. Hence, no yearly adoption of transport tariffs by the VREG.

For Wallonia, the adoption date of new tariffs by the regional DSOs is done on the 1st of March. Hence, our study considers the tariffs applied as from the 1st of March 2022, going on until the 28th of February 2023.

Distribution costs

When consumers are also connected to the distribution grid, which is the case for all our residential and small professional profiles, distribution tariffs must be added to the transmission tariffs mentioned above. Like transmission costs charged by regional DSOs, each DSO publishes their tariff sheets from which fees were selected based on the voltage level. As our profiles have different voltage levels, we assume that each profile can be characterised as follows:

Profiles	Brussels	Flanders	Wallonia
E-RES	BT	LS Piekmeting	BT Sans mesure de pointe
E-SSME	BT	LS Piekmeting	BT Sans mesure de pointe
E-BSME	1-26 kV	1-26 kV	MT Avec mesure de pointe

There is a relatively similar component in the distribution sheets of all the DSOs of all regions, namely “Tariff for the use of the distribution grid”. This component is composed of three terms:

Table 26: Distribution cost composition in Belgium

Brussels	Flanders	Wallonia
Capacity term (EUR/Year)	Capacity term (EUR/kW, and EUR/kVA for E-BSME)	Capacity term
Fixed term (EUR/Year)	-	Fixed term
Proportional term (EUR/kWh)	Proportional term	Proportional term

As from the 1st of January 2023, Flanders has adopted a new distribution tariff structure, with significant changes for all network users. For all users, the distinction between day and night tariffs disappeared. For users connected to the low voltage grid (E-RES and E-SSME), a capacity tariff, including a minimum contribution equivalent to 2,5 kW, was introduced. There are several reasons for adopting this tariff such as encouraging consumers to spread their demand during the day in order to ensure an affordable electricity grid in the future, correctly reflecting the costs of the grid maintenance and development, and ensuring that the network costs are shared between network users in a fair manner.

The manner of charging will be done differently depending on the consumer’s metering system. For network users with a digital meter, the capacity tariff is based on the monthly peaks, i.e., the highest 15 minutes power measured by the digital meter within each month. For consumers with a traditional analogue meter, the capacity tariff is represented by a fixed term. In this report, the results are presented only for network users with a digital meter (“piekmeting”). The beneficiaries of the social tariff are not directly exposed to the capacity tariff. Next to the capacity term, a small proportional term (EUR/kWh) remains for all low voltage network users.

For users connected to the medium voltage grid in Flanders (E-BSME), the capacity term, which was based on the annual peak until 2022, is now based for 50% on the monthly peak and for 50% on the contracted capacity which can be set by each network user. Penalties apply if the network user exceeds his contracted capacity. There is no more proportional term in the tariff for the use of the distribution grid.

Brussels[88] assesses its capacity term based on consumers' annual peak, while Wallonia considers both the yearly and monthly peaks. The yearly peak is considered as the peak over the last 11 months before invoicing month and makes up for 75% of the component. Monthly peak, the remaining 25%, is determined as the peak of the invoicing month. It is to be noted that the capacity term only applies from consumer E-BSME and in Wallonia there is also a tariff for the regulatory balance since March 1st, 2019.

Furthermore, Wallonia and Brussels regions differentiate these distribution charges according to the time of the day, which is not the case in Flanders after the introduction of the capacity tariff. As such, different prices prevail whether electricity is consumed during daytime hours (from 7 am to 10 pm during weekdays) or night-time (from 10 pm to 7 am during weekdays and all hours during weekends)[89]. Besides, an exclusive night-time tariff exists (same hours as night-time schedule) for consumers equipped with meters only functioning overnight.

Besides, the following components are part of distribution tariffs:

Table 27: Other distribution cost components in Belgium

Brussels	Flanders	Wallonia[90]
Metering costs	Tariff of data management[91]	Regulatory balances
	Tariff for other transmission costs[92]	

Considering tariffs are region- and DSO-dependent, we compute the weighted average for each component. The weights of elements are attributed based on the number of EAN connections[93] per DSO. For Flanders and Wallonia, all operating DSOs are considered, representing 100% of the EAN connections[94]. In Brussels, Sibelga is the only DSO, representing 100% of EAN connections.

Component 3 – all other costs

In Belgium, several additional fees apply to electricity. Because of the existence of three regions, these costs often have different rates that are only applicable to a specific region. To summarise the above, two aspects must be considered when looking at the other costs. Firstly, there are costs on the federal level and the three regional levels. Secondly, there are PSOs (Public Services Obligations) on one side and taxes, levies, and surcharges on another side. These costs are summarised below with a distinction between average costs to all three Belgian regions and the one's specific per region. As from 2022, it is to be noted that all federal charges are directly invoiced by the energy suppliers to the end-consumer (previously, some charges first passed through the DSOs before reaching the energy suppliers). The proceeds are paid to the Federal Public Service of Finance. The FPS Finance pays the necessary amounts to the Belgian TSO Elia on the one hand, and to the CREG on the other hand. Some regional charges are levied by regional DSOs, others are levied by Elia.

[88] In Brussels, the capacity term for "BT sans mesure de pointe" customers is based on the connection point capacity in EUR/kVA.

[89] There are some exceptions in Wallonia for residential customers in a limited number of areas, for which off-peak hours during the week are from 9 pm to 6 am. Based on professional judgement, we believe those exceptions would not impact the results and, therefore, are not considered for the analysis.

[90] Charges for metering activities in Wallonia are built in tariffs for the use of the distribution grid.

[91] In 2019, the Flemish government conferred Fluvius the role of data manager with a view to the roll-out of the digital meter, among other things. The activities to be performed by the data manager concern data recorded by all types of meter, not only digital meters, but also analogue and electronic meters. The costs of all these activities will be charged as of 2021 via the data management tariff which replaces the metering costs.

[92] Note that only 76,77% of this tariff is included in the network cost component presented in this report, as this is the share related to the former transmission network tariff components that have been integrated in this new tariff component since 2023: tariff for market integration, tariff for the management of the electric system, tariff for power reserves and black start. The remaining 23,23% of this tariff component is included in the all other cost component.

[93] EAN (European Article Numbering) is a unique code attributed to meters and which indicates a supply point for electricity or natural gas.

[94] The number of EAN connections for Flanders and Wallonia at their 2022 level.

Tariff rates (excluding VAT) are mentioned when they do not vary depending on the consumer profile and/or the DSO; otherwise, units in which they are expressed are detailed:

Table 28: Other costs for residential and small professional electricity consumers applying in all three Belgian regions

All regions	Profiles
Regional Public Service Obligations (Regional PSOs)	
Regional PSOs on distribution[95]	
a. A general tariff for regional PSOs (expressed in EUR/MWh)	All
Taxes and levies on the federal level	
a. Energy contribution[96] (1,9261 EUR/MWh). b. Special excise duty	a. E-RES and E-SSME b. E-RES, E-SSME and E-BSME

As of 1st of January 2022 the federal contribution, offshore contribution, Green Power Certificate contributions and Strategic Reserve contributions have been replaced by the special federal excise duty, still configured this way in January 2023. This means that only the degressive amount of the special excise duty is applicable for this report. From 1st of November 2022 until the 31st of March 2023, the degressive special excise duty has been modified for professional consumers[97] to lower the amounts due for consumers until 1.000 MWh of yearly consumption. This excise duty was included in the report of the previous year.

The table below shows the tax rates applied as of 1st January 2023 at the Federal level in Belgium for both residential and commercial profiles regarding the special excise duty.[98]

Table 29: Special excise duty rates in Belgium for residential and commercial electricity consumers

Yearly consumption	Tax for E-RES (EUR/MWh)	Tax for professional profiles (E-SSME and E-BSME) (EUR/MWh)
Consumption up to 20 MWh	13,6	0,5
Consumption between 20 – 50 MWh	11,58	0,5
Consumption between 50 - 1.000 MWh	10,9	0,5
Consumption between 1.000 – 25.000 MWh	10,23	10,69
Consumption between 25.000 - 100.000 MWh	2,4	2,73
Consumption above 100.000 MWh	1,0	0,5

[95] For each region of Belgium, we compute the tariff through a weighted average of each component across all DSO active in the region (weights are given in terms of number of EAN connection per DSO).

[96] Not applicable on E-BSME profile because it has a connection level > 1kV.

[97] Loi-programme of the 26th of December 2022

[98] In Section 5 it is further detailed the exemption that is applied to Industrial consumers for this excise duty.

Table 30: Regional other costs for residential and small professional electricity consumers[99]

Brussels	Flanders	Wallonia	Profiles
Regional Public Service Obligations (Regional PSOs)			
Regional PSOs on transmission			
a. Financing of regional energy policies[100] (E-RES and E-SSME: 1,52 - 7,62 EUR/month; E-BSME: 1,06 EUR/kVA)	-	a. Funding of support measures for renewable energy[101] (10,3761 EUR/MWh)	All
Taxes and levies on the regional level			
Regional taxes and levies on distribution			
a. Charges on non-capitalised pensions (0,193 – 0,898 EUR/MWh)	a. Surcharges for distribution[102] (0,1918 – 1,2448 EUR/MWh)	a. Levy for occupying road network (2,6478 – 2,9976 EUR/MWh)	All
b. Levy for occupying road network (4,0837 EUR/MWh)	b. Contribution for the energy fund[103] (0 – 181,85 EUR/month)	b. Corporate income tax (3,083 - 6,243 EUR/MWh)	
c. Corporate income tax and other taxes (0,519 – 4,313 EUR/MWh)	c. Other transmission costs related to regional PSOs, taxes and levies on transmission (0,9393 EUR/MWh)[104]	c. Other local, provincial, regional, and federal taxes, Charges, Surcharges, Fees, and contributions (0,0006 - 0,02346 EUR/MWh)	
Regional taxes and levies on transmission			
-	-	a. Connection fee (75 EUR/MWh for the first 0,1 MWh; 0,3 - 0,75 in EUR/MWh for consumption above 0,1MWh)	All
-	-	b. Levy for the use of the public domain (0,4018 EUR/MWh)	

In addition to these previously mentioned taxes and levies, the three Belgian regions also implemented **certificate schemes** that come as another indirect cost. Even though these schemes mechanisms are similar, they present regional differences. Every year, suppliers must reach a certain quota, differing depending on the region, of green certificates, or they are fined. Suppliers charge these additional costs to their customers. We consider the extra "Green Certificate costs" surcharge published by each of the selected suppliers on their tariff sheets in each of the regions. In Wallonia, there is a reduction on the green certificate scheme for holders of a climate change or sector agreement, which we consider applies to profile E1 and above and is therefore not considered for residential and small professional consumers[105].

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[99] The tariffs represented in this table vary depending on the DSO and we have thus chosen to only present the minimum and maximum range of the tariff from the largest (or only) DSO of the region. Sibelga for Brussels, Imewo for Flanders and ORES Hainaut for Wallonia.

[100] (Sibelga, 2020)

[101] In Wallonia a partial exemption of 85% applies for holders of a sectoral energy efficiency agreement, meaning that the E-BSME profile can profit from this reduction.

[102] The distribution tariff sheets from the DSOs do not include more levels of details regarding the surcharges.

[103] This tariff has been set to 0 for all residential consumers in 2023 as a measure to alleviate the energy crisis for households.

[104] All regional PSOs, taxes and levies that are passed on from the transmission system operator to the distribution system operators are integrated in the "tariff for other transmission costs" component of the distribution tariff in Flanders since 2023. This is calculated as being 23,23% of the "Other transmission cost" tariff component.

[105] See General assumptions.

Flanders also has a reduction on the green certificate scheme which is based on the NACE-code, the total consumption, the gross value added and the energy bill of the company. Besides, while there is a green certificate system for renewable energies in each region, Flanders also has a certification scheme for combined heat/power (WKK).

As of the 1st of April 2023, the special excise duty has been reformed with an effective date in July 2023, and a transitory period from April 2023 to June 2023.

Component 4 – VAT

Since March 2022, the VAT on electricity has been temporarily lowered from 21% to 6% for residential consumers. The energy crisis continuing, those measures have been extended several times until 31 March 2023. As of the 1st of April 2023, the VAT on electricity has been permanently fixed at 6%.

This VAT is not due on the contribution for the energy fund in Flanders and on the connection fee in Wallonia.

Germany

Component 1 – the commodity price

Germany had an HHI-index of 2.021 for the retail market in 2014[106]. We thus consider three products for both profiles E-RES and E-SSME. However, Germany presents peculiarities leading to separately identifying each mentioned product for each region:

1. As detailed in the methodology section of Germany, different areas are considered because of the existence of price divergences, and all have different standard products called *Grundversorgung*. Product 1 is always the standard product for each of the regions.
2. For the 2023 update, as opposed to what was done last year, the products and prices for German E-RES and E-SSME profiles were retrieved from the stromanbietervergleich.net comparator. This changed from last year as, in 2022, the information was provided by the CREG due to the extra-ordinary situation on the energy markets. The lack of active suppliers on the market and the lack of offerings to new customers were other reasons. For comparison purposes to last year, we decided to re-use the equal split for the weight of products, that was applied in 2022. Therefore, the same weight (33,33%) is assigned to all products in all regions since the market shares of the different providers are not always available and assigning the switching rate to the standard product of the market incumbent did not seem to be the correct approach.

In previous countries, we have set out which weights are attributed to the chosen products. The table below illustrates the products' weights assigned for German products in 2023 because of the inconsistency of data with the methodology used for the other regions.

Table 31: Profile weights depending on the German product

Product	Weight E-RES	Weight E-SSME
Standard product of the market incumbent	33,33%	33,33%
Cheapest product on the market	33,33%	33,33%
Cheapest product of the market incumbent	33,33%	33,33%
Total	**100,00%**	**100,00%**

[106] (European Commission, 2014). As Germany keeps no longer track on this indicator, no more recent data available.

The prices presented in the following table still integrate taxes (except VAT) and network costs because German suppliers use “all-in tariffs”. The following products and prices were retrieved using the comparison website stromanbietervergleich.net.

Table 32: Annual cost of selected products for profile E-RES in Germany

Region	Supplier - product	Grundpreis (EUR/year) [107]	Arbeitspreis [108] without dual tariff (EUR/kWh)	Arbeitspreis without dual tariff (EUR/year)
Bayernwerk	E.ON – Grundversorgung Strom HH	160,90	0,33	981,18
	Maingau – StromGarant	50,42	0,36	1.044,12
	Vattenfall – Easy12 Strom	109,92	0,36	1.060,88
SWM Infrastruktur Stammgebiet	SWM – Grund- und Ersatzversorgung HH Lastschrift	107,88	0,52	1.526,47
	Grünwelt Energie – Strom Easy 12	74,48	0,34	1.010,00
	E.ON Energie – Strom Öko	123,83	0,39	1.148,82
E-DIS	E.ON – Grundversorgung Strom HH	159,32	0,56	1.642,94
	FUXX – Spar-FUXX Optimal 123	148,16	0,40	1.164,12
	E.ON Energie – Strom Öko	159,58	0,47	1.379,71
Stromnetz Berlin	Vattenfall Sales – Berlin Tarif Berlin Basis Privatstrom	102,89	0,41	1.217,94
	Grünwelt Energie – Strom Easy 12	63,08	0,37	1.082,94
	Vattenfall – Easy12 Strom	89,75	0,38	1.116,76
Westnetz	EW Aach – H20 Naturstrom GV HH	119,27	0,46	1.353,24
	Grünwelt Energie – Strom Easy 12	120,11	0,35	1.035,29
	Vattenfall – Easy12 Strom	109,92	0,37	1.096,18
RNG-Netz 2-Köln	RheinEnergie – FairRegio Strom Basis	184,72	0,55	1.617,06
	FUXX – Spar-FUXX Optimal 123	188,69	0,31	923,53
	Vattenfall – Easy12 Strom	150,25	0,34	1.013,82
Netze BW	EnBW Energie– EnBX Komfort HH	119,27	0,37	1.097,35
	Grünwelt Energie – Strom Easy 12	120,09	0,35	1.035,29
	Vattenfall – Easy12 Strom	109,92	0,37	1.096,18
Stuttgart Netze	EnBW – EnBX Komfort HH	119,27	0,37	1.097,35
	FUXX – Spar-FUXX Optimal 123	104,42	0,35	1.042,35
	Vattenfall – Easy12 Strom	50,42	0,39	1.134,41

[107] Basic price (fixed)
[108] Labour price (variable)

Table 33: Annual cost of selected products for profile E-SSME in Germany

Region	Supplier - product	Grundpreis (EUR/year)	Arbeitspreis without dual tariff (EUR/KWh)	Arbeitspreis without dual tariff (EUR/year)
Bayernwerk	E.ON Energie – E.ON Grundversorgung Strom HH	160,90	0,28	8.409,00
	Grünwelt Energie – Strom Classic	78,61	0,28	8.490,00
	Vattenfall – Natur12 Strom Standard	130,08	0,30	9.069,00
SWM Infrastruktur Stammgebiet	Stadtwerke München – Grund- und Ersatzversorgung HH Lastschrift	107,88	0,44	13.083,00
	Grünwelt Energie – Strom Classic	50,42	0,28	8.508,00
	Stadtwerke Duisburg – R(h)einpower MeinStrom 12	124,18	0,30	9.141,00
E-DIS	E.ON Energie – E.ON Grundversorgung Strom HH	159,32	0,47	14.082,00
	Maingau Energie – Maingau StromGarant	50,42	0,34	10.323,00
	E.ON Energie – E.ON ÖkoStrom Home & Drive 12	37,96	0,38	11.388,00
Stromnetz Berlin	Vattenfall Sales – Berlin Basis Privatstrom	102,89	0,35	10.440,00
	Grünwelt Energie – Strom Classic	50,42	0,30	9.135,00
	Vattenfall – Easy12 Strom berlin	89,75	0,32	9.573,00
Westnetz	EW Aach – EW Aach H20 Naturstrom GV HH	119,28	0,39	11.598,00
	Grünwelt Energie – Strom Classic	83,07	0,29	8.724,00
	E.ON Energie – E.ON ÖkoStrom Home & Drive 12	203,81	0,33	9.903,00
RNG-Netz 2-Köln	RheinEnergie – FairRegio Strom Basis	184,72	0,46	13.860,00
	Grünwelt Energie – Strom Classic	112,47	0,27	8.076,00
	E.ON Energie – E.ON ÖkoStrom Home & Drive 12	243,12	0,31	9.177,00
Netze BW	EnBW Energie – EnBW Komfort HH	119,28	0,31	9.405,00
	Grünwelt Energie – Strom Classic	83,07	0,29	8.724,00
	E.ON Energie – E.ON ÖkoStrom Home & Drive 12	203,81	0,33	9.903,00
Stuttgart Netze	EnBW Energie – EnBW Komfort HH	119,28	0,31	9.405,00
	Grünwelt Energie – Strom Classic	50,42	0,31	9.276,00
	E.ON Energie – E.ON ÖkoStrom Home & Drive 12	118,68	0,35	10.467,00

The commodity price could not be extracted through the comparing site for the E-BSME profile, and we have thus used the data that was provided to us by the CREG[109]. The EEX Futures and EPEX DAM prices are the national indexes employed in the computation. CREG did not take the weekend hours of the EPEX SPOT DE DAM into account for the E-BSME profile.

$$\textit{Commodity price}$$
$$= 36.5\%\, CAL\, Y_{-1} + 27.4\%\, CAL\, Y_{-2} + 21.4\%\, CAL\, Y_{-3} + 8.2\%\, Qi_{-1} + 4.2\%\, Mi_{-1} + 2.3\%\, EPEX\ Spot\ DE$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two years ahead forward price in 2021
CAL Y_{-3}	Average three years ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

Component 2 – network costs

The German electricity market is quite different from the Belgian one. The four TSOs exclusively operate on the (extra-) high voltage grid whereas all lower voltage levels are managed by DSOs (often up to 110 kV).

Furthermore, the German price-setting offers less transparency because they use “all-in tariffs”, meaning that the consumer is only presented one tariff without a clear distinction of its components. As described in the dataset, we offer results for four TSO, but since Germany counts more than 800 DSOs[110], a weighted average of 2 DSOs (one rural and one urban) is being presented. This is the case for the E-RES and E-SSME profile. Since the commodity price of E-BSME is computed with a formula, network costs must be added separately. A more detailed description is provided in “Chapter 5. Component 2 – network costs” E-BSME is subject to the same network costs as the E0 and E1 profiles.

When it comes to the transmission and distribution tariff methodology, German DSOs and TSOs offer a similar structure even though terms are labelled differently. Although every DSO imposes different rates for different ranges of both maximum capacity contracted and electricity consumer, it always involves the same 3 components which are synthesised in the table underneath:

Table 34: Components of the German network costs

Network costs		
Component	**German label**	**Explanation**
Basic charge	Grundpreis	The basic fee expressed in EUR/year.
Consumption charge	Arbeitspreis	It depends upon the volume of energy consumed in kWh/year, expressed in cEUR/kWh/year.
Metering costs	Messstellenbetrieb	The charges are related to the cost of metering and invoicing, fixed prices expressed in EUR/year.

[109] The formula is based on an analysis carried by the Belgian regulator of electricity supply contracts of all Belgian consumers with consumption higher than 10 GWh dating back to 2015.
[110] (European Commission, 2019)

Component 3 – all other costs

Regarding German taxes and levies, 7 surcharges apply on electricity price:

(1) The "*KWKG-Umlage*" – Kraft-Wärme-Kopplungsgesetz or Combined Heat and Power Act – is a tax contributing to CHP-plant subsidies. The calculation is based on the present forecast data of DSOs and the Federal office for Economic Affairs and Export Control (BAFA). This cost (3,57 EUR/MWh) applies to E-RES, E-SSME and E-BSME[111].

(2) The "*StromNEV*" or Electricity Network Charges Ordinance, based on the regulation of charges for access to electricity networks § 19, is a digressive levy to compensate for §19 transmission tariff reductions. This cost (4,17 EUR/MWh) applies to E-RES, E-SSME and E-BSME[112].

(3) The "*Offshore-Netzumlage*" or Offshore Network Levy, is a digressive levy. Several rates apply depending on the consumption level and discounts can be granted from above 1 GWh, which does not concern the profiles under review in this section. We thus use the basic rate (5,91 EUR/MWh) for all profiles[113].

(4) The "*EEG-Umlage*" – Erneuerbare-Energie-Gesetz or Renewable Energy Act – is a contribution to the renewable energy financing other than offshore wind power generation unit. The EEG-Umlage was abolished by law as of 1 January 2023. In the future, the federal budget will be used to finance the promotion of renewable energy.[114]

(5) The "*Stromsteuer*" or Electricity tax, as its translation shows, is a tax on electricity with a standard rate (20,50 EUR/MWh) that remains unchanged since 2003[115].

(6) The "*Konzessionsabgabe*" or Concession fee, is a tax (18,23 EUR/MWh) imposed on all users to fund local governments. The municipality size, as well as the contract type of the consumer[116], constitute the criteria regarding the applied rate. Reductions may be granted from a 30 MWh annual offtake.

(7) The "*Abschaltbaren Lasten-Umlage*" or Interruptible loads levy, is a tax that was used to offset compensation payments made by transmission system operators to demand-side response (DSR) service providers. In 2023 no more AbLaV levy are being charged.[117].

Component 4 – VAT

If Germany allowed for a temporary VAT rate reduction on natural gas, this measure was not extended to electricity and the historical rate of 19% remains applicable on electricity consumption for residential consumers[118].

Price cap for electricity in 2023

As of 1st March 2023 (and with a retroactive effect for January and February 2023), a price cap applies for electricity as a temporary measure to protect households and other small-scale users from an uncontrolled natural gas price increase. For private households (E-RES) and companies with a historical electricity consumption up to 30 MWh per year (E-SSME), the electricity price will be capped at 0,40 EUR/kWH (including taxes, levies and other charges) for up to 80% of their electricity consumption of the previous year. For the remaining consumption, users will have to pay the regular market price.[119] For industrials consuming more than 30 MWh per year,), the electricity price will be capped at 0,13 EUR/kWH (net) for up to 70% of their electricity consumption of the previous year. The remaining consumption is paid at regular market price.

[111] (Netztransparenz.de, 2023)
[112] (Netztransparenz.de, 2023)
[113] (Netztransparenz.de, 2023)
[114] Netztransparanz.de, 2023)
[115] (Bundesamt für Justiz, 2021)
[116] We distinguish the basic contract, or "*Grundversorgung*", and the other types of contracts.
[117] (Netztransparenz.de, 2023)
[118] https://www.vatcalc.com/germany/germany-slashes-vat-on-gas-to-7-following-eu-block/
[119] (Bundesregierung, 2022)

France

Component 1 – the commodity price

The HHI of the retail market in France is over 2.000 in 2021[120], meaning that only three products are considered: the standard product, the cheapest offer on the market and the most affordable product of the market incumbent. For E-RES profile, as the cheapest offer on the market this year is also the cheapest product of the market incumbent, we had to choose the second cheapest product on the market. In 2019, the switching rate for household products in France was 11,0%, and the switching-rate for non-household consumers was 10,5%.[121] The methodology for assigning weights to the products is different for France because most consumers contract the regulated product. The market share for the regulated product is taken as its weight, and the third product has the rest of the weights.

Table 35: French product weights depending on the profile

Product	Weight E-RES	Weight E- SSME
Standard product of the market incumbent	73,00%	73,00%
(Second) Cheapest product on the market	13,00%	11,00%
Cheapest product of the market incumbent	14,00%	16,00%
Total	**100,00%**	**100,00%**

In France, consumers are presented with "all-in tariffs" which toughens the extraction of the commodity component. Using the price comparison website that the CRE puts forward, http://comparateur-offres.energie-info.fr. The commodity cost presented below still includes network and all other costs, but the VAT has already been deducted.

Table 36: Annual cost of selected products for profile E-RES in France

Region	Supplier – Product	Fixed component (EUR/year)	Price for peak consumption (EUR/year)	Price for off-peak consumption (EUR/year)
France	EDF - Tarif bleu - réglementé (particuliers)	182,32	297,07	255,71
	Happ-e by Engie - Happ-e electricité de Engie	180,19	297,07	255,71
	EDF - Tempo	179,32	214,51	159,10

Table 37: Annual cost of selected products for profile E-SSME in France

Region	Supplier – Product	Fixed component (EUR/year)	Price for peak consumption (EUR/year)	Price for off-peak consumption (EUR/year)
France	EDF - Tarif Bleu - réglementé professionels	616,42	3.259,80	1.731,60
	Energie d'ici - 100% locale & 100% renouvelable	539,50	3.092,40	1.920,00
	ENGIE - Electricité Activert 1 an	716,89	3.241,80	1.719,60

All consumers in France can benefit from governmental intervention on the commodity costs through specific mechanism called ARENH[122]. This mechanism, described in detail in chapter 5, enables alternative electricity suppliers (i.e. suppliers different from EDF, the historical electricity supplier in France) to obtain part of the nuclear electricity production from EDF under specific conditions set by the French public authorities.

[120] (CEER, 2021)
[121] (CEER, 2021)
[122] ARENH stands for *Accès Régulé à l'Electricité Nucléaire Historique*, or *Regulated Access to Historic Nuclear Electricity*

Component 2 – network costs

As in Germany, the transmission and distribution costs are also integrated as one tariff in France. While this might help consumers to better understand their bill, it also makes it less transparent. There are several DSOs in France, but Enedis has a market share of 95% for continental France.[123] Because of this, it is the only DSO that is considered in France in the present study. Distribution prices in France are known as the 'Tarif d'Utilisation du Réseau Public d'Electricité' (TURPE). Since 1st August 2021 TURPE 6 is in force for an estimated period of 4 years. The CRE has approved the new price list applicable from 1st August 2022 to 31st July 2023 on 9th June 2022.[124] The French distribution cost consists of 3 components.

Table 38: Distribution costs in France

<table>
<tr><td colspan="3">Network costs</td></tr>
<tr><td>Component</td><td colspan="2">Explanation</td></tr>
<tr><td>Management component[125][126]</td><td colspan="2">The management component depends on whether a consumer has a unique contract or not. We assume profiles E-RES and E-SSME opted for exclusive contracts.</td></tr>
<tr><td rowspan="7">Component for taking off electricity[127]</td><td colspan="2">Multiple prices options exist varying depending on a utilisation length and temporal differentiators capacity and consumption components. The prices options are:</td></tr>
<tr><td>Consumers < 36 kVA (E-RES)</td><td>Consumers ≥ 36 kVA (E-SSME)</td></tr>
<tr><td>1. Short use (CU)</td><td>1. Short use (CU)</td></tr>
<tr><td>2. Short use with 4 temporal classes (CU4)</td><td>2. Long use (LU)</td></tr>
<tr><td>3. Medium use with a temporal differentiation between peak and off-peak hours (MUDT)</td><td></td></tr>
<tr><td>4. Medium use with 4 temporal classes (MU4)</td><td></td></tr>
<tr><td>5. Long use (LU)</td><td></td></tr>
<tr><td>Metering tariff[128]</td><td colspan="2">The metering tariff depends on whether the meter is owned by the consumer or not. The assumption is taken that all three profiles (E-RES, E-SSME and E-BSME) do not own their meters.</td></tr>
</table>

Consumers E-RES and E-SSME face different prices options as depicted in the table above. Concerning E-RES, only two price options out of five presented are considered: CU4 and MU4. The reason behind this lies in the heavy usage of 'Linky' smart meters. As we assume residential consumers to be equipped with 'Linky' smart meters from 2020 onwards, CU4 and MU4 are the only price options available. As for E-SSME, it can either opt for CU or LU prices options. In both cases, both price options were calculated. As we cannot anticipate which option our potential consumers will prefer, all options are computed and are presented as a price range.

MU4 and CU both rely on 4 temporal classes: peak hours high season (HPH), off-peak hours high season (HCH), peak hours low season (HPB) and off-peak hours low season (HCB). SLP S21 (E-RES) and SLP S11 (E-SSME) for 2020 were used and resulted in the following allocation to determine the proportion of electricity consumed during each temporal class.

[123] (Enedis, 2019)

[124] https://www.services-rte.com/fr/actualites/turpe-6-2022.html

[125] Since 2018, the level of this component also considers the financial compensation paid to suppliers in connection with the management of single-contract customers.

[126] French labelling: Composante annuelle de Gestion

[127] French labelling: Composante annuelle de soutirage

[128] French labelling: Composante annuelle de comptage

Table 39: Allocation of consumption per temporal class in France

Distribution of consumption per temporal class		
Temporal class	**E-RES**	**E-SSME**
HPH	35%	34%
HCH	11%	12%
HPB	38%	40%
HCB	16%	14%

With regards to profile E-BSME, it falls under the category HTA1 for which 4 prices options are available:

(1) Short use with fixed peak (CU fixed peak);

(2) Short use with mobile peak (CU mobile peak);

(3) Long use with fixed peak (LU fixed peak);

(4) Long use with mobile peak (LU mobile peak);

In a similar fashion to the first two profiles, we computed each price option that is presented as a price range. Given that these price options also depend on temporal classes, allocation of hours was also estimated. However, we used RTE's timeframe (see below) to determine hours allocation, considering that E-BSME does not operate during weekends.

Table 40: Hours per temporal classes in France

Hours per temporal classes		
Temporal class	**Weekdays**	**Weekends**
Peak (“Heures Pointe”)	4h/day for three months (December to February)	/
HPH (“Heures Pleines Saison Haute”)	12h/day for three months (December to March) + 16h/day for 2 months (March and November)	/
HCH (“Heures Creuses Saison Haute”)	8h/day for five months (November to March)	24h/day for five months (November to March)
HPB (“Heures Pleines Saison Basse”)	16h/day for seven months (April to October)	/
HCB (“Heures Creuses Saison Basse”)	8h/day for seven months (April to October)	24h/day for seven months (April to October)

Component 3 – all other costs

In France, two additional surcharges must be considered for residential and small professional consumers:

Table 41: Other costs in France (E-RES, E-SSME, E-BSME)

Title	Definition	Amount
Contribution Tarifaire d'Acheminement : **CTA**	The CTA finances part of the pensions of staff in the energy sector for Electricity and Natural gas Industries. It is only being applied to the subscription part of the tariff (HT)	As from August 2021, the CTA rate has been reduced to 21,93% for residential and small professional consumers that are connected to the distribution grid and are due on the fixed and power component of the network tariffs (E-RES to E-BSME profiles).[129] It has been reduced to 10,11% for consumers connected to the public transport network or distribution grid ≥ 50kV (E0 to E4 profiles). *Note: as network tariffs may vary according to the selected price option, the CTA amount may therefore also vary*
Accise sur l'électricité *(ex-CSPE including the TICFE and TCFE (composed of the TDCFE & TCCFE)*[130]	This excise is a tax that applies to all deliveries of electricity sent to an end user. Its amount is calculated according to consumption.[131]	Since 1st February 2022 and until 31st January 2024, the excise on electricity is reduced from his 2016 historical value of 22,5 EUR/MWh to: - 1 EUR/MWh for consumers ≤36 kVA (E-RES) - 0,5 EUR/MWh for Consumers >36 kVA and ≤250 kVA (E-SSME) *This measure is part of the tariff shield ("bouclier tarifaire") for households and small businesses.*

Component 4 – VAT

Two different VAT rates apply to electricity tariffs, 5,5% and 20%.

For consumers < 36 kVA (E-RES): the reduced 5,5% rate is imposed on the subscription and the CTA, while the standard 20% rate is applied on the consumers' actual consumption[132].

For Consumers ≥ 36 kVA (E-SSME): the standard 20% rate applies to the actual consumption as well as to the Excise on Electricity (i.e. previously CSPE), to the TCFE (Taxes on Final Electricity Consumption) and the TICFE ("Taxe intérieure sur la Consommation finale d'électricité").

[129] (CRE, 2019)

[130] The « Taxe sur la Consommation Finale d'Électricité » (TCFE) was in 2022 including the « Taxe Départementale sur la Consommation Finale d'Électricité (TDCFE) » and the « Taxe Intérieure sur la Consommation Finale d'Électricité »TICFE. As from January 2023, it also includes the « Taxe Communale sur la Consommation d'Electricité » (TCCFE).

[131] More detail about the TICFE is provided in Chapter 5

[132] https://pro.engie.fr/faq/tout-sur-l-energie/taxes-et-lois/montant-tva-electricite-gaz-naturel

The Netherlands

Component 1 – the commodity price

In the Netherlands, the HHI-index was 2.018 in 2021[133]. Therefore, we consider three products. These are the standard product, the cheapest product on the market and the most competitive product of the second-largest supplier. The switching rate provided by the CEER is 27,06% for the Netherlands in 2020 and it is the weight attributed to the cheapest product for both profiles E-RES and E-SSME[134]. Other products weights are computed based on the normalised market share, which are presented in the table below.

Table 42: Normalised market shares of the largest two Dutch energy suppliers

Energy supplier	Customers	Normalised market share[135]
Essent	3.300.000	56,90%
Eneco	2.500.000	43,10%

Weights are allocated according to the following calculations regarding normalised market shares. The weight of the cheapest product equals the annual switching-rate (27,06%). The normalised market share of the market incumbent is 56,9%, estimated as 3.300.000/(3.300.000+2.500.000), and therefore 43,1% for the second-largest supplier. The market incumbent product has a weight of (100%-27,06)*56,90% and the product of the second-largest supplier of (100%-27,06%)*43,10%, which respectively results in 41,5% and 31,43%. The table below presents the applied weights of profiles E-RES and E-SSME.

Table 43: Profile weights depending on the Dutch product

Product	Weight
Standard product of the market incumbent	41,5%
Cheapest product on the market	27,06%
Cheapest product of the second largest player	31,44%
Total	**100%**

As no price comparison tool was giving a complete overall picture of the prices and products on the market in the Netherlands, similarly as in the UK, we scouted the 10 largest energy providers and analysed their most competitive offerings. The result is the Table 44 for E-RES and Table 45 for E-SSME below.

Table 44: Annual cost of selected products for profile E-RES in the Netherlands

Region	Supplier – Product	Fixed component (EUR/year)	Price for peak consumption (EUR/year)	Price for off-peak consumption (EUR/year)
Netherlands	Essent - Groene Stroom Flexiblel	64,36	1.216,13	1.152,17
	BudgetEnergie - Variabel	59,40	568,75	552,15
	Eneco - Hollandse Wind & Zon	59,40	592,70	620,92

133 (CEER, 2022)

134 No distinction between household and non-household switching rates could be found. Consequently, we use a unique switching rate for both profiles E-RES and E-SSME.

135 A more detailed explanation of the need of this normalised market share to compute commodity prices can be found under the section "Residential and small professional consumers' commodity computation methodology - Weight of each product within the product portfolio" (p. 115).

Table 45: Annual cost of selected products for profile E-SSME in the Netherlands

Region	Supplier – Product	Fixed component (EUR/year)	Price for peak consumption (EUR/year)	Price for off-peak consumption (EUR/year)
Netherlands	Essent - Groene Stroom	64,32	10.030,50	6.687,00
	BudgetEnergie - Variabel	71,87	4.998,06	2.390,16
	Eneco - Hollandse Wind & Zon MKB	71,88	4.197,60	2.342,88

As already mentioned, the previous methodology applied for our profiles E-RES and E-SSME, whereas CREG used a formula to compute the commodity costs for E-BSME and provided PwC with the data already computed. The computation rests on market prices and describes the cost of electricity for industrial consumers as of January 2023. CREG used the ICE Index CAL and the APX NL DAM as national indexes for the computation. The underneath commodity formula is used for each profile. For E-BSME, CREG did not include weekend hours of APX NL DAM. The CREG provided the data and the formula used for commodities pricing in this investigation.[136]

$$\textit{Commodity price}$$
$$= 36.5\%\,CAL\,Y_{-1} + 27.4\%\,CAL\,Y_{-2} + 21.4\%\,CAL\,Y_{-3} + 8.2\%\,Qi_{-1} + 4.2\%\,Mi_{-1} + 2.3\%\,APX\;NL\;DAM$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two years ahead forward price in 2021
CAL Y_{-3}	Average three years ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

Component 2 – network costs

Network prices in the Netherlands are integrated as one tariff and are built on the four components presented in the table below[137]. We take the weighted average of all six distribution zones' prices.

Table 46: Network cost for electricity in the Netherlands (E-RES, E-SSME, E-BSME)

Network costs		
Component	**Dutch labelling**	**Explanation**
Standing charge	Vastrecht	Fixed basic fee (expressed in EUR/year).
Capacity charge	Capaciteitstarieven	The fixed fee is covering the costs associated with the transmission of electricity. Its height depends on the capacity of the connection (expressed in EUR/year).
Periodical connection tariff	Periodieke aansluitvergoeding	The fixed fee is covering the costs for managing the connection (expressed in EUR/year).
Metering charge	Meettarief	The fixed charges are covering the use and management of energy meters (expressed in EUR/year).

[136] The equations are based on an analysis of all Belgian consumers with a yearly usage higher than 10 GWh performed by the Belgian regulator of the electricity supply.
[137] (ACM, 2020)

The capacity charge is composed differently for the E-BSME profile:

- Fixed charge depending on the contracted capacity, expressed in EUR/year;
- Variable charge depending on the monthly peak expressed in EUR/kW/month;
- Variable charge depending on the consumption level, expressed in EUR/kWh.

Component 3 – all other costs

Unlike previous years, only one surcharge remains in the Netherlands for the profiles discussed in this part of the study, namely the Energy Tax ("Regulerende Energie Belasting", or REB). In the 2023 Tax Plan, the Dutch government has indeed proposed to simplify the energy tax system by including the rates for the surcharge for sustainable energy and climate transition ("Opslag Duurzame Energie", or ODE) directly in the energy tax. As a result, all ODE rates for the year 2023 are reduced down to 0,00 EUR. (As from 2024, the ODE will be formally abolished)[138]

The Energy Tax (REB) varies, in a degressive trend, according to the amount of consumed electricity as shown in the table below:

Table 47: Electricity Energy Tax and ODE bands (Netherlands, 2023)[139]

Band	Consumption (in kWh)	Energy Tax (EUR/kWh – VAT excl.)	ODE levy (EUR/kWh – VAT excl.)
1	Up to 10.000	0,12599	0,00000
2	10.001 - 50.000	0,10046	0,00000
3	50.001 - 10.000.000	0,03942	0,00000
4	> 10.000.000 (professional)	0,00115	0,00000
4bis	> 10.000.000 (non-professional)	0,00175	0,00000

Given the consumption level of our profiles under study, they fall into the following bands: 1 for E-RES, 2 for E-SSME and 3 for E-BSME. At the same time, all household will receive a fixed refund on the energy tax, fixed at 493,27 EUR excl. VAT (596,85 EUR incl. VAT) in 2023.[140]

Component 4 – VAT

A temporary reduction on the VAT rate for electricity has been agreed for six months during the second part of the year (with a reduced rate of 9% for July to December 2022). This reduction was valid to all households, thus applying also to low-income ones. This measure is however not applicable anymore in 2023 and is back to its previous level since 1st January 2023[141].

Price cap for electricity in 2023

In 2023, a price cap is applied for electricity as a temporary measure to protect households and other small-scale users from an uncontrolled electricity price increase. In concrete terms, up to 2.900 kWh of electricity used during the whole year, a maximum rate of 0,40 EUR/kWh will apply in 2023[142]. The rest of the electricity consumption will be paid at market price by the beneficiaries of this price cap (E-RES; E-SSME and E-BSME).

This new scheme applies to small-scale users, defined as "everyone with a regular energy connection, like households, small businesses and community associations. The building with the connection must be designated as a home or workplace, however." The price cap also applies to small and medium-sized enterprises (SMEs) with a regular connection.

138 https://www.vattenfall.nl/grootzakelijk/energiebelasting/tarieven/
139 ibid
140 ibid
141 (Expat-Check.com, 2022)
142 (Government.nl, 2022)

The UK

Component 1 – the commodity price

In the UK suppliers often combine electricity and natural gas in one product, the so-called dual tariff, which is supposed to result in lower prices. Since this is not the case in all the other countries and to have a consistent methodology across the study, we only consider products where electricity is offered by itself. Furthermore, suppliers in the UK generally present all-in tariffs that are not entirely transparent. These tariffs consist of:

- The Standing Charge (fixed element), which is expressed in p/day and covers the fixed costs of the DSO; and
- Unit Rate Charge (variable element), which is expressed in p/kWh and varies according to the energy consumption.

Since we only want the commodity price in this section, network charges, taxes and VAT from these 'all-in tariffs' were extracted. Commodity prices of a supplier are not very different between regions, and for the sake of simplicity, we only look at the commodity price in one region, which is then used for all 14 DSO regions. An Ofgem study from 2015[143] analysed the prices throughout the different regions, and out of this study, Yorkshire appeared to be the median zone in terms of commodity price. For this reason, the selected products come from the Yorkshire region. The network cost, VAT and taxes are deducted from the all-in prices of the Yorkshire region. Like other countries in review, the weighted average of network tariffs for all DSOs are used to determine the network cost.

For this 2023 update, the products and prices were fetched on the 10 largest energy providers in the UK, due to the lack of reliable and complete comparator, both for E-RES and E-SSME profiles. Since we assume that it correctly represents the energy market for both residential profiles, the weights calculation follows the methodology logic. The year 2023 is still exceptional, and as such most providers only have one type of product offered for residential profiles. Hence, there is no possibility to obtain more than one product from the market incumbent. As a result, products 3 and 4 were selected as being the most competitive products of the second and third largest suppliers.

The switching rate in the UK is of 16,00%, hence the weight taken by the cheapest on the market. We then compute the normalised market shares of the providers which products were selected, and apply the same formula, for example for the standard product of the market incumbent (100-16)*47,99%, or 40%. The same is done for the cheapest of the second largest player and the cheapest of the third largest player.

Table 48: Profile weights depending on the products in the UK

Product	Weight E-RES	Weight E-SSME
Standard product of the market incumbent	40,00%	40,00%
Cheapest product on the market	16,00%	16,00%
Cheapest product of the second largest player	35,00%	35,00%
Cheapest product of the third largest player	9,00%	9,00%

The prices displayed in the table below are VAT exclusive but still encompasses the network costs and taxes. It is important to mention that the standard products in the UK are governed by two mechanisms put in place. The energy price cap, introduced by the market regulator (OFGEM) in 2019 with the objective of reducing the impact of an increase of energy costs on final consumers, and the energy price guarantee.

On the one hand, the energy price cap (came into effect in 2020) sets a maximum price cap that providers of energy can charge consumers for each kWh used and this cap considers all costs components (commodity costs; network costs; policy costs; supplier operating costs and VAT)[144].

[143] (OFGEM, 2015)
[144] (OFGEM, 2022)

On the other hand, the energy price guarantee (came into effect in October 2022) is a measure guaranteeing that households would pay on average £2,500 on their energy bill until end of March 2023. It translates as a limit of £0.34 per/kWh and a daily standing charge of £0.46 for electricity[145] (rates are averages and depend on the region, payment method and meter type).

Table 49: Annual cost of selected products for profile E-RES in the UK

Region	Supplier – Product	Fixed component (EUR/year)	Price for variable (EUR/year)
UK	British Gas – Standard Monthly DD	196,01	1.199,73
	Octopus Energy – flexibleOctopus	189,57	1.199,69
	E.ON – NextFlex	196,01	1.199,69
	Shell Energy – Direct Debit	196,01	1.199,73

Table 50: Annual cost of selected products for profile E-SSME in the UK

Region	Supplier – Product	Fixed component (EUR/year)	Price for variable (EUR/year)
UK	British Gas - Standard Variable	201,82	11.083,27
	Octopus Energy – flexibleOctopus	189,57	10.283,08
	E.ON – NextFlex	196,01	10.283,08
	Shell Energy – Direct Debit	196,01	10.283,41

The commodity price of the E-BSME profile could not be extracted from the comparison website and is therefore computed on the market prices and describes the cost of electricity for industrial consumers as of January 2023. We used the APX UK DAM as the national index for the calculation. The CREG provided us with the formula used for commodity pricing and is based on an analysis carried by the Belgian regulator of electricity supply contracts of all Belgian consumers with consumption higher than 10 GWh[146]. We do not use the weekend hours of APX UK DAM for the E-BSME profile.

$$\textit{Commodity price} \\ = 36.5\%\, CAL\, Y_{-1} + 27.4\%\, CAL\, Y_{-2} + 21.4\%\, CAL\, Y_{-3} + 8.2\%\, Qi_{-1} + 4.2\%\, Mi_{-1} + 2.3\%\, APX\, UK\, DAM$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two years ahead forward price in 2021
CAL Y_{-3}	Average three years ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

[145] (OFGEM, 2022)

[146] Based on the data available to us from Bloomberg, we used the following indices ELU0YR1, ELU0YR2 and ELU0YR3 to calculate respectively the CAL Y-1, CAL Y-2 and CAL Y-3.

Component 2 – network costs

Transmission costs

The transmission costs in the UK are covered by the Transmission Network Use of System (TNUoS) charges and have two possible options: Non-Half-Hourly (NHH) and Half-Hourly (HH). The E-RES and E-SSME profiles are subject to NHH and E-BSME to the HH rate.

Table 51: Transmission costs in the UK

Transmission costs		
Tariff option	**Explanation**	**Profile**
Not Half-Hourly (NHH)	Monthly metered customers are paying a demand rate in function of their electricity consumption, expressed in p/kWh.	E-RES and E-SSME
Half-Hourly (HH)	Metering system, which utilises AMR (automatic meter reading) technology to provide electricity consumption reading. The system sends updated meter reads to the energy supplier every half hour. Customers pay a capacity tariff depending on their connection capacity, expressed in p/kVA/day.	E-BSME

The NHH tariff is zonal, meaning that the rates differ between all fourteen zones of the UK. We use a weighted average value of these fourteen zonal tariffs as transmission cost for our E-RES and E-SSME profiles.

Distribution costs

Our residential and small professional profiles are subject to these costs but follow a different methodology because it depends on the connection voltage. The distribution costs, called Distribution Use of System (DUoS) tariffs, follow two possible charging methods. Since all of our residential and small professional profiles are connected to the LV-grid, the "Common Distribution Charging Methodology" (CDCM) is applicable.[147] This methodology encompasses the following components:

Table 52: Distribution costs in the UK

Distribution costs	
Component	**Explanation**
Total consumption	A unit charge in p/kWh
Fixed charge	Fixed charge per offtake points in p/MPAN[148]/day
Metering costs[149]	Cost for use and management of your energy meter in p/day or GBP/year

To estimate the UK prices, we took the weighted average (based on the number of connections of DSOs) of the fourteen zonal tariffs to calculate the distribution costs.

[147] (ENA, 2020)

[148] Meter Point Administration Number

[149] Electricity metering charges in the UK are not easily accessible. A proxy was used to account for these charges based on a methodology disclosed by National Grid, the British TSO delivering electricity and natural gas. As electricity and natural gas are frequently offered as one product with a dual tariff, natural gas metering methodology was used as a proxy. Charges are billed as a fixed yearly charge for installation costs recovered via a rental given that we assume our profiles do not own the meters.

Component 3 – all other costs

Four additional costs are applicable on electricity in the UK:

1. Energy suppliers need to account for the cost of the **Energy Company Obligation (ECO)** scheme, which helps to reduce carbon emissions and tackle energy poverty. This ECO scheme "has seen 4 iterations, ECO, ECO1, ECO2 and ECO3 […]. The ECO3 scheme closed on 31 March 2022 and the ECO4 Order came into force in July 2022. ECO4 applies to measures installed from 1 April 2022 and will cover a four-year period until 31 March 2026.[150] The cost of the ECO scheme represents, according to Ofgem, around 25% of the electricity invoice.[151]

2. The **Climate Change Levy** (CCL) is applicable to the consumption of electricity and natural gas for businesses in the industrial, public services, commercial and agricultural sectors. This levy is "an environmental tax charged on the energy that businesses use. It's designed to encourage businesses to be more energy efficient in how they operate, as well as helping to reduce their overall emissions."[152]

   The following table gives an overview of the rates that are charged to professional consumers regardless of their profile (Residential consumers are exempted from it[153]):

   Table 53: Climate Change Levy rates on electricity[154]

Time period	Electricity rate (GBP)
1st April 2022 to 31st March 2023	0.775p/kWh
1st April 2023 to 31st March 2024	0.775p/kWh
1st April 2024 to 31st March 2025	0.775p/kWh

3. The **Renewables Obligation (RO)** is the cost placed on electricity suppliers in the UK for the large-scale renewable subsidy scheme. Like the Climate Change Levy, the quota and buyout price are determined for a year starting in April. From 1st April 2022 to 31st March 2023, the buyout price per RO Certificate is 59,01 GBP (66,63 EUR).

4. The **Assistance for Areas with High electricity distribution Costs (AAHEDC)** levy compensates for high distribution costs in the zone of Northern Scotland (1 of the 14 zones), amounting 0,040670 p/kWh for the period ranging from 1st April 2022 to 31st March 2023.[155]

Component 4 – VAT

Electricity used for residential and domestic purposes is subject to a 5% VAT in the UK.[156]

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[150] https://www.ofgem.gov.uk/environmental-and-social-schemes/energy-company-obligation-eco

[151] As no exact price could be identified for this cost, a proxy derived from OFGEM's website is used. We consider ECO to account for the full weight of Environmental and Social Costs component as estimated by OFGEM. https://www.ofgem.gov.uk/consumers/household-gas-and-electricity-guide/understand-your-gas-and-electricity-bills (OFGEM, 2020)

[152] https://www.sefe-energy.co.uk/help-and-support/bills-payments/what-is-the-climate-change-levy-ccl/

[153] (GOV.UK, 2023)

[154] ibid

[155] https://www.nationalgrideso.com/industry-information/charging/assistance-areas-high-electricity-distribution-costs-aahedc

[156] (GOV.UK, 2023)

Natural gas

Natural gas: Detailed description of the prices, price components and assumptions

For all countries under review, this section details:

1. **Commodity costs** for profiles G-RES and G-PRO.
2. **Network costs** for profiles G-RES and G-PRO.
3. **All other costs** for profiles G-RES and G-PRO.
4. **VAT** for profile G-RES.

Profile	Consumption (kWh)
G-RES	23.260
G-PRO	300.000

Belgium

Contrary to what is observed in other countries, the Belgian natural gas suppliers have quite transparent price sheets. Commonly the current price sheets can be found online on each providers website. The price sheets also give a good overview of all charged components.

Component 1 – the commodity price

In 2021[157], the HHI of the retail market in Belgium was over 2.000. According to the methodology, this entails that only three products are considered: the standard product of the market incumbent, the cheapest product of the market incumbent, and the cheapest offer on the market. The switching rate for households in Belgium is 26,92% (G-RES). The products of the market incumbent for G-RES thus each weight (100%-26,92%)/2 or 6,54%.

Table 54: Profile weights depending on the products in Belgium

Product	Weight G-RES
Standard product of the market incumbent	36,54%
Cheapest product on the market	26,92%
Cheapest product of the market incumbent	36,54%
Total	**100%**

The table below gives an overview of the selected products per region and their annual cost, which is based on the profile's characteristics. To choose these products, price comparison websites of the respective regional regulators were used[158]. All prices reported are VAT excluded.

Table 55: Annual cost of selected products for profile G-RES in Belgium

Region	Supplier – Product	Fixed component (EUR/year)	Variable component (EUR/year)
Brussels	ENGIE – Engie Electrabel Easy Indexed ENGIE – Engie Electrabel Direct TotalEnergies - Pixel	38,50 16,50 23,58	2.406,90 1.808,21 1.948,40
Wallonia	ENGIE – Engie Electrabel Easy Indexed MEGA - MEGA Online Flex Variable 1 an ENGIE – Engie Electrabel Direct	38,50 15,00 16,50	2.406,90 1.713,78 1.808,21
Flanders	ENGIE – Engie Electrabel Easy Indexed Energie.be - Gas ENGIE – Engie Electrabel Direct Indexed 1 jaar	38,50 33,02 16,50	2.406,94 1.680,41 1.808,23

While this methodology provides an objective view of the market situation in Belgium, one must be aware that it does not provide a full overview of market prices as only three products were considered to depict the Belgian commodity prices. In addition, due to the limitations of the web comparison tools and the continued uncertainties observed on the energy market during the last few months, there might be inconsistencies between the regions/countries under review regarding the type of products selected. For example, depending on the country indexed products can be calculated with forward or with backward looking prices. However, we do not believe these differences would impact the overall conclusions of this report.

[157] (CEER, 2022)

[158] Flanders : https://vtest.vreg.be; Brussels : www.brusim.be; Wallonia : www.compacwape.be

The commodity component for the G-PRO profile was not extracted from a comparison site but is based on the prices observed in January 2023 and they are provided by the CREG for the 2023 update. The formula that was used to compute the commodity cost for this profile is the same as the large industrial profiles and is set out in the corresponding segment. However, it is known that most Belgian industrial consumers' contracts are TTF indexed[159], which represents their most significant component of natural gas bills.[160] The CREG provided all necessary commodity data and already calculated the commodity cost for G-PRO and all other industrial gas profiles.

Component 2 – network costs

Transport costs

As discussed in the consumer profiles, we assume that G-RES profile is connected on the T2 level and G-Pro on the T3 level. The transport costs disclosed by Fluxys in 2023[161].

Table 56: Transmission cost of Belgian TSO

TSO	Transport cost (EUR/kWh)
Fluxys	0,00144

The transport cost for residential and small professional consumers takes the entry and exit tariffs into account while also taking a weighted average of low (L) and high (H) caloric natural gas.

Distribution costs

Since both G-RES and G-PRO profiles are connected to the distribution grid, distribution tariffs must be considered and therefore added to the transport costs. Like the transport tariffs, the T2 and T3 levels were chosen for respectively G-RES (T2) and G-PRO (T3). Typically, each Belgian region splits distribution tariffs into a different number of components but has at least one common component: *tariff for the use of the network*, which is always composed of*:*

a. Fixed term (expressed in EUR/Year).

b. Proportional term (expressed in EUR/kWh).

Besides, other components are part of the distribution costs, although they vary depending on the region. Brussels includes a tariff for the measuring activities and Flanders includes a tariff of data management and the system management. In contrast, Wallonia only adds a tariff for regulatory balances.

Since tariffs vary between regions and DSOs, a weighted average is computed across all DSOs that are active in the region. The weight is distributed according to the number of EAN connections the DSO owns in the region. In Flanders, all DSOs operated by Fluvius were considered. For Wallonia, all DSOs operated by ORES, as well as RESA, were considered. Both regions' market shares can be found in chapter 3. Belgium. In Brussels, Sibelga is the unique DSO to be running and therefore selected.

[159] https://www.creg.be/nl/publicaties/studie-f2410, (CREG, 2022).

[160] This method tackles down the non-intuitive results that were obtained with the previous methodology as a commodity price can undergo heavy variations month to month and therefore lessen significant differences regarding commodity prices between countries considering their distinct situation within a period.

[161] (Fluxys, 2023)

Component 3 – all other costs

There are additional costs in Belgium that can be charged to our natural gas consumers under review. While two additional costs are at the federal level and apply to all profiles, regional costs exist in Brussels and Wallonia. These costs are summarised below with a distinction between common costs to all three Belgian regions and the ones specific per region. It is to be noted that federal charges are levied by suppliers and regional charges are levied by regional DSOs (and invoiced to the suppliers which invoice final customers). Tariff rates are mentioned when they do not vary depending on the consumer profile and/or the DSO; otherwise, units in which they are expressed are detailed:

Table 57: Other costs for residential and small professional natural gas consumers applying to all Belgian regions

All regions	Profiles
Regional Public Service Obligations (Regional PSOs) on distribution	
a. A general tariff for regional PSOs (expressed in EUR/MWh)	a. G-RES b. G-PRO
Taxes and levies on the federal level	
I. Federal taxes and levies	
a. Energy contribution (0,9978 EUR/MWh) b. Energy contribution (0,54 EUR/MWh) c. Special excise duty	a. G-RES b. G-PRO c. G-RES and G-PRO

The table below shows the new Federal special excise duty rates, applicable from the 1st of November 2022 until the 31st of March 2023 (Loi-Programme 26/12/2022) to G-RES and G-PRO profiles. The base tariffs for the excise duty can be found in the previous edition of this report. For clarity, we have displayed the tariffs applicable at the effective date of the comparison done.

Table 58: Special excise duty rates in Belgium for natural gas consumers

Yearly consumption	Tax for G-RES (EUR/MWh)	Tax for G-PRO (EUR/MWh)
Consumption up to 20.000 MWh	0,54	0,00
Consumption between 20.000- 50.000 MWh	0,46	0,00
Consumption between 50.000- 250.000 MWh	0,44	0,54
Consumption between 250.000 – 1.000.000 MWh	0,34	0,42
Consumption between 1.000.000 – 2.500.000 MWh	0,18	0,22
Consumption above 2.500.000 MWh	0,15	0,15

Table 59: Other regional costs for residential and small professional natural gas consumers[162]

Brussels	Flanders	Wallonia	Profiles
Regional Public Service Obligations (Regional PSOs) on transport			
a. Brussels regional public service obligation[163] (0,80 or 4,79 EUR/month)	-	-	All
Taxes and levies on the regional level			
Regional taxes and levies on distribution			
a. Charges on non-capitalised pensions (0,103 - 0,173 EUR/MWh)	a. Charges on non-capitalised pensions (0,2391EUR/MWh)	a. Levy for occupying road network (1,676 - 1,910 EUR/MWh)	All
b. Levy for occupying road network (1,429 EUR/MWh)	b. Other local, provincial, regional, and federal taxes, Charges, Surcharges, Fees, and contributions (0,0467 EUR/MWh)	b. Corporate income tax (0,8233-1,2883EUR/MWh)	
c. Corporate income tax and other taxes [164] (0,519 - 0,862 EUR/MWh)	-	c. Other local, provincial, regional, and federal taxes, Charges, Surcharges, Fees, and contributions (0,0012 - 0,0018 EUR/MWh)	
Regional taxes and levies on transport			
-	-	Connection fee 0,075 EUR/kWh for the first 1 MWh; then – if yearly consumption < 1 GWh: 0,000075 EUR/kWh – if yearly consumption < 10 GWh: 0,00006 EUR/kWh – if yearly consumption >= 10 GWh: 0,00003 EUR/kWh	All

Component 4 – VAT

Since April 2022, the VAT on natural gas has been temporarily lowered from 21% to 6% for residential consumers. The energy crisis continuing, this measure has been extended several times until 31 March 2023. The federal government announced that as of 1 April 2023, the VAT on natural gas will be permanently fixed at 6%. No VAT is due on the connection fee in Wallonia. In addition, the special excise duty is being reformed as of 1 April 2023, with a transition period from April to June 2023 (included). It will be fully in place as of July 2023.

[162] The tariffs represented in this table vary depending on the DSO and we have thus chosen to only present the minimum and maximum range of the tariff from the largest (or only) DSO of the region. Sibelga for Brussels, Fluvius Antwerpen for Flanders and ORES Hainaut for Wallonia.

[163] Depends on the calibre of the meter being installed.

[164] Brussels groups the last two regional taxes as one labelled “Financing of Corporate income tax & other taxes”.

Germany

German natural gas suppliers generally present only two tariffs on their tariff sheets, a fixed tariff per month (in EUR/month), the “Grundpreis”, and a variable price named “Arbeitspreis” per kWh of natural gas consumed (in cEUR/kWh). Since Germany uses “all-in tariffs”, which are less transparent, we deducted the network costs, taxes, and VAT to retrieve the commodity component.

Component 1 – the commodity price

The CEER does not set out the German HHI for natural gas suppliers[165], and we have thus taken the EU Energy market study from 2014. This study tells us that the HHI-index was 300 in 2014 for our natural gas profiles, meaning that five products should be considered. Since Germany counts plenty of small suppliers that offer low prices, no supplier can be considered consistently as the largest one across the whole of Germany. Therefore, we adapted the methodology for this country, and only three products were found: the standard product of the market incumbent, the cheapest offer on the market and the most affordable product of the market incumbent. While this approach might pose a limitation, we expect it to have a limited impact on representativeness, given the robustness offered by the regional approach, as three products are selected for every DSO region under study (8 times 3 products). The standard product (“*Grundversorgung*”) is offered by a standard supplier, which varies in every DSO region.

For the report of 2022 CREG provided PwC with the products and prices for the German regions, like the E-Res and E-SSME profiles. For the update of 2023 this was not the case, multiple sources were consulted by PwC to retrieve the necessary information (comparison tools and websites of energy providers). Regarding the weights, the same approach as the one used for the electricity profiles is used for this study (same weight is assigned to all the products – 33,33%).

Table 60: Profile weights depending on the products in Germany

Product	Weight G-RES
Standard product of the market incumbent	33,33%
Cheapest product on the market	33,33%
Cheapest product of the market incumbent or the 2nd largest supplier	33,33%

[165] Source : CEER, 2022. Germany is one of the few European countries that does not monitor this indicator. The other ones are Denmark, Finland, Sweden and Latvia.

The prices presented in the table below still integrate taxes (excluding VAT) and network costs because German suppliers use "all-in tariffs".

Table 61: Annual cost of selected products for profile G-RES in Germany

DSO	Supplier - product	Grundpreis[166] (EUR/year)	Arbeitspreis[167] (EUR/year)
Bayernwerk	E.ON Energie – E.ON Grundversorgung Erdgas	192,00	3.345,53
	MAINGAU – Maingau-GasKomfort	151,29	2519,47
	E.ON – Erdgas Öko	195,03	3.004,24
SWM Infrastruktur Stammgebiet	Stadtwerke München – Grundversorgung	118,88	4.584,61
	FUXX – Grund-Fuxx GAS Ideal	108,45	2.341,22
	E.ON – E.ON Erdgas Öko	160,04	2.865,11
E-DIS	EWE Vertrieb – EWE Erdgas comfort	170,36	3.197,71
	MAINGAU – MAINGAU GasKomfort	151,29	2.312,96
	E.ON – E.ON Erdgas Öko	256,49	2.739,03
Stromnetz Berlin	GASAG – GASAG ERDGAS Komfort	156,00	4.280,27
	FUXX – Grund-Fuxx GAS Ideal	100,04	2.419,47
	GASAG – GASAG Naturgas 12	160,82	4.021,59
Westnetz	Thüga Energie – Thüga ClassicGas	120,00	4.152,02
	FUXX – Grund-Fuxx GAS Ideal	114,17	2.404,26
	Thüga Energie – Thüga OnlineGas	120,00	2.595,56
RNG-Netz 2-Köln	RheinEnergie – FairRegio Erdgas Basis	145,01	3.723,77
	FUXX – Grund-Fuxx GAS Ideal	143,33	2.369,48
	E.ON – E.ON Erdgas Öko	199,40	2.897,72
Netze BW[168]	ENRW Energieversorgung Rottweil – ENRW Grund- un Ersatzversorgung	119,89	3.332,48
	FUXX – Grund-Fuxx GAS Ideal	107,21	2.319,48
	E.ON – E.ON Erdgas Öko	163,29	2.895,54
Stuttgart Netze	EnBW Energie – EnBW ErdgasPlus	91,07	2.943,37
	FUXX – Grund-Fuxx GAS Ideal	100,04	2.573,82
	E.ON – E.ON Erdgas Öko	145,68	3.117,27

The CREG has provided the values for the G-PRO profile in Germany.

[166] Basic price (fixed)

[167] Labour price (variable)

[168] For this provider the report of 2022 looked at the village Weilen. The price comparison tool could not generate results for this village in 2023 ("Es konnten keine Tarife zu Ihren Einstellungen gefunden werden") so the choice was made for another neighbouring village, i.e. Deilingen (postal code 78586).

Component 2 – network costs

As for the methodology employed for electricity, four rural (1/zone) and four urban DSOs (1/zone), for a grand total of eight DSOs, are selected. As both of our profiles, G-RES and G-PRO are connected to the distribution network; they are thus subject to transport and distribution costs, which are integrated into one single tariff. Besides, we assume these profiles to fall under the category "*Netzentgelte für Entnahmestellen ohne Leistungsmessung*" (or network charges for offtake points without power metering) as their consumption is yearly metered.

The annual charge is comprised of four components as listed below, even if DSOs might use different bands or rates:

Table 62: Distribution costs in Germany

Network costs		
Component	**German label**	**Explanation**
Basic charge	Grundpreis	A fixed basic fee expressed in EUR/year.
Consumption charge	Arbeitspreis	A variable element which depends upon the volume of energy consumed in cEUR/kWh/year.
Metering costs	Messung	Fixed charges related to the cost of metering and invoicing, for which we assume our residential and small professional consumers to have been metered annually.
Metering point operation per counting point charges	Messstellenbetrieb	

German annual charge for natural gas is computed as follows:

$$Annual\ charge =$$

$$Arbeitspreis * (Annual\ Consumption - \ Durch\ Grundpreis\ abgegoltene\ Arbeit) + Grundpreis$$

Where, "*Durch Grundpreis abgegoltene Arbeit*" is the price band bottom level, expressed in kWh.

Depending on the consumers' consumption volumes, they fall under certain categories (the number of categories depends on the local DSO). These categories determine the amount of consumption volume that must be set at a standard rate, while the rest fall under the network cost fares as determined by local DSOs. These volumes are said to be compensated to limit network costs and ultimately, DSOs' remuneration.

Component 3 – all other costs

We flagged three supplementary costs for natural gas consumers in Germany: the "*Energiesteuer*" or Gas tax, the "*Konzessionsabgabe*" or Concession fee and the *"CO2 Steuer"* or Carbon tax:

- The "*Energiesteuer*" or Natural gas tax, is an energy tax that applies at several rates depending on the consumer. This price of 5,50 EUR/MWh is the standard rate when using natural gas for heating purposes[169], which is applied for our G-RES profile. Regarding our small professional profile, G-PRO, a reduced rate is ranging from 4,12 EUR/MWh to 2,07 EUR/MWh as companies fall under other regimes specified by the law when not using natural gas for heating purposes[170].
- The "*Konzessionsabgabe*, or Concession fee, exists for electricity and natural gas depending on the municipality size and the contract type of the consumer. As it is impossible to compute a weighted average of the fee, we calculated a non-weighted mean for the four categories of municipalities. Since the natural gas usage has different associated prices, we computed two rates respectively for our two studied profiles:
    - Natural gas only for cooking and for hot water in municipalities (7,05 EUR/MWh): we attribute this usage to strictly residential consumers (G-RES)[171].
    - Natural gas for other purposes (3,05 EUR/MWh): we attribute this usage to SME consumers (G-PRO)[172]. As small professionals fall under reduced rates as the law implemented special rates for companies.
- The "CO2 Steuer" or Carbon tax is an energy tax that is applied to the gas used for heating and transport and it is applicable to all consumers profiles under review. The rate amounts to 0,5461 ct/kWh of gas consumed (0,65 ct/kWh incl. VAT).

Component 4 – VAT

As a measure to combat inflation and to offset the impact of a new gas levy on consumers, Germany decided to temporary reduce the VAT rate applicable on natural gas from 19% to 7%. This reduced rate will apply from 1st October 2022 until 31 March 2024 and is therefore used for residential consumers (G-RES) in this iteration of our study[173].

Price cap for natural gas in 2023

As of 1st March 2023 (and with a retroactive effect for January and February 2023), a price cap applies for natural gas as a temporary measure to protect households and other small-scale users from an uncontrolled natural gas price increase. For private households (G-RES) and companies with a historical gas consumption up to 1.500 MWh per year (G-PRO and G0), the natural gas price will be capped at 0,12 EUR/kWh (including taxes, levies and other charges) for up to 80% of their natural gas consumption of the previous year. For the remaining consumption, users will have to pay the regular market price.[174] For industrials consuming more than 1.500 MWh per year the natural gas price will be capped at 0,07 EUR/kWh for up to 70% of their 2021-level gas consumption.[175]

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[169] (Bundesamt für Justiz, 2021)

[170] § 54 and § 55 Energiesteuergesetz

[171] (Bundesamt für Justiz, 2021)

[172] (Bundesamt für Justiz, 2020)

[173] https://www.vatcalc.com/germany/germany-slashes-vat-on-gas-to-7-following-eu-block/

[174] https://www.bundesregierung.de/breg-en/news/energy-price-brakes-2156430

[175] https://www.energypolicy.columbia.edu/publications/understanding-germanys-gas-price-brake-balancing-fast-relief-and-complex-politics/#:~:text=Industry%E2%80%94around%2024%2C000%20to%2025%2C000,ends%20on%20April%2030%2C%202024.

France

Component 1 – the commodity price

Only three products are considered for the French market since the HHI of the retail market in France is over 2.000 in 2021[176]. These products are the standard product of the market incumbent, the cheapest product on the market and the most affordable product of the market incumbent. As defined by the methodology, the weight of the most inexpensive option equals the annual switching rate and is 16,44% for household consumers.[177] The weights of the products for the G-RES profile are set out in the table below.

Table 63: Profile G-RES weight for each product

Product	Weight G-RES
Standard product of the market incumbent	41,78%
Cheapest product on the market	16,44%
Cheapest product of the market incumbent	41,78%

To extract the commodity price, we have used the price comparison website that the CRE puts forward, http://comparateur-offres.energie-info.fr. In France, consumers are presented with “all-in tariffs” which toughens the extraction of the commodity component. Therefore, we present the total cost without VAT but with other taxes and network costs.

Table 64: Annual cost of selected products for profile G-RES in France

Region	Supplier – Product	Fixed component (EUR/year)	Variable price based on consumption (EUR/year)
France	ENGIE - Gaz Tranquilité 1 an (tarif réglementé) Gaz de Bordeaux - Gaz Indexé Bouclier Tarifaire EDF - Avantage Gaz Optimisé	262,75 236,83 355,01	2.008,11 2.008,11 2.008,11

As mentioned before, six price zones exist in France. Given that our consumers’ profiles could be randomly dispersed on the territory, the price zone with the most significant number of cities, reflecting, therefore, the majority prices, were used.

In France, residential consumers and consumers with an annual consumption up to 300 MWh can benefit from regulated tariffs (“*tarifs réglementés*”). The table below lists consumers categories that can benefit from it:

Table 65: Categories depending on the yearly consumption in France

Annual consumption (MWh/year)	Network	Type of consumers	Usage	Category
< 1 MWh	Distribution network	Residential and Industrial consumers	Cooking	Base
1 < x < 6 MWh			Hot water	B0
6 < x < 300 MWh			Individual heating	B1
			Small boiler	B2i

However, in November 2019, French public authorities decided to terminate the commercialisation of such tariffs even if existing contracts remain in force until December 2020 for professional consumers and June 2023 for residential consumers.

[176] (CEER, 2022)
[177] (CRE, 2019)

Component 2 – network costs

Transport costs

Transmission tariffs have the following components:

1. Transport costs (expressed in EUR/MWh).
2. Storage costs (expressed in EUR/MWh) are charged on final residential consumers to finance the cost of storing natural gas to smoothen the seasonal demand effect.

Distribution costs

As stated before, 96% of all distributed natural gas in France is delivered by GRDF (Gaz Réseau Distribution France)[178], which is why GRDF is considered as the sole DSO for this study. Given their annual consumption levels, both G-RES and G-PRO are subject to the tariffs T2. The fare has three components:

1. Subscription (expressed in EUR/year);
2. A daily capacity charge (expressed in EUR/MWh/day);
3. A proportional component (expressed in EUR/MWh).

Component 3 – all other costs

In France, two additional surcharges must be considered for residential and small professional consumers:

Table 66: Other costs in France (G-RES, G-PRO)

All other costs		
Name	**Definition**	**Amount in 2023**
Contribution Tarifaire d'Acheminement : **CTA**	The CTA finances part of the pensions of staff in the energy sector for Electricity and Natural gas Industries.	20,80% for residential and small professional consumers that are connected to the distribution grid and are due on the fixed component of the network tariffs.[179] *Note: as network tariffs may vary according to the selected price option, the CTA amount may therefore also vary*
Taxe Intérieure de Consommation sur le Gaz Naturel : **TICGN**	The TICGN is a tax that applies to all deliveries of natural gas sent to an end user. Its amount is calculated according to consumption.	8,37 EUR/MWh. This rate has been falling since 2020, and it decreases here by €0,04 compared to 2022.[180]

Component 4 – VAT

A reduced VAT rate of 5,5% applies to the amount of the subscription as well as on the CTA.

The standard 20% VAT rate applies to the amount of consumption as well as on the TICGN.

[178] (CRE, 2019)
[179] https://selectra.info/energie/guides/comprendre/taxes
[180] https://selectra.info/energie/guides/comprendre/taxes/ticgn

The Netherlands

Component 1 – the commodity price

The HHI-index of the retail market in the Netherlands is higher than 2.000 in 2021.[181] Therefore, three products are considered: the standard product of the market incumbent, the cheapest product of the market incumbent, and the cheapest offer on the market.

The switching rate for households in the Netherlands is 27,31% (G-RES). The products of the market incumbent for G-RES thus each weight (100%-27,31%)/2 or 36,345%.

Table 67: Profile weights for each product in the Netherlands

Product	Weight G-RES
Standard product of the market incumbent	36,34%
Cheapest product on the market	27,31%
Cheapest product of the market incumbent	36,34%
Total	**100,00%**

The cheapest product was obtained by consulting a Dutch price comparison website https://www.energieleveranciers.nl/ and energy providers' websites. The weight of the products for profiles G-RES is presented in the table above. The products selected for profiles G-RES and their prices are stated in the next tables. These prices exclude charges and taxes.

Table 68: Annual cost of selected products for profile G-RES in the Netherlands

Region	Supplier – Product	Fixed component (EUR/year)	Variable price based on consumption (EUR/year)
The Netherlands	Essent – Modelcontract Gas Variabel	64,32	4.594,86
	Green Choice - Zorgeloos Energie tot 1-9-2023	62,81	2.568,66
	Eneco – Gas 1 jaar	59,40	1.786,14

As described in the section "Natural gas: Countries/Zone(s) identified", suppliers have the option to apply a regional surcharge, based on how far the region is situated from Groningen. Yet, the selected suppliers did not do this and offered the same prices for each region. Besides, the Dutch network is primarily supplied with the so-called "Groningen-gas". This natural gas has a lower calorific value (L-gas) than the natural gas used in most of Western Europe (H-gas). As prices in the Netherlands are reported by m³ instead of by kWh, a conversion factor is used. The latter is of 9,77 kWh/m³ as all residential and small users, use low caloric natural gas[182].

The commodity price for the G-PRO profile is the January 2023 observed prices for TTF, and the CREG provided all commodity prices data.

[181] (CEER, 2022)

[182] (Gasunie Transport Services, 2020), 1 m^3 under normal conditions (zero degrees Celsius, 1 atm) is considered to have a calorific value of 35.17 MJ (Groningen-gas equivalent) with a conversion factor of 1 MJ= 0.278 kWh.

Component 2 – network costs

As it is the case for electricity, the Netherlands use a combined tariff including four components:

Table 69: Components of network costs in the Netherlands

Network costs		
Component	**Dutch labelling**	**Explanation**
Standing charge	Vastrecht	Fixed basic fee (expressed in EUR/year).
Capacity charge	Capaciteitstarieven	Fixed fee covering the costs associated with the transport of natural gas. Its height depends on the capacity of the connection (expressed in EUR/Year/m³/h).
Periodical connection tariff	Periodieke aansluitvergoeding	Fixed fee covering the costs for managing the connection (expressed in EUR/year).
Metering charge	Meettarief	Fixed charges are covering the use and management of energy meters (expressed in EUR/year).

As the Dutch distribution tariffs are notably dependent on a capacity charge, which is based on the m³ volume consumption, the same conversion factor, as mentioned above, is used.

Component 3 – all other costs

Unlike previous years, only one surcharge remains in the Netherlands for the profiles discussed in this part of the study, namely the Energy Tax ("Regulerende Energie Belasting", or REB). In the 2023 Tax Plan, the Dutch government has indeed proposed to simplify the energy tax system by including the rates for the surcharge for sustainable energy and climate transition ("Opslag Duurzame Energie", or ODE) directly in the energy tax. As a result, all ODE rates for the year 2023 are reduced to 0,00 EUR (as from 2024, the ODE will be formally abolished)[183]. Next to this the Energy Tax has also raised as a stimulation measure from the Dutch government. The energy tax for gas has increased, while the energy tax for electricity has decreased. The reasoning behind this is that households would opt more often for electric heat options (e.g. heat pumps), or for sustainable heat options (e.g. geothermal heat).[184]

The Energy Tax (REB) varies, in a degressive trend, according to the amount of consumed gas as shown in the table below:

Table 70: Gas Energy Tax and ODE bands (Netherlands, 2023)[185]

Band	Consumption (in kWh)	Energy Tax (EUR/m³ – VAT excl.)	ODE levy (EUR/m³ – VAT excl.)
1	Up to 170.000	0,48980	0,00000
2	170.001 – 1.000.000	0,09621	0,00000
3	1.000.001 - 10.000.000	0,05109	0,00000
4	> 10.000.000 (professional)	0,03919	0,00000

As the Energy Tax is fixed in EUR per volume units (EUR/m³) and not in EUR per energy unit, the calorific value of the used natural gas has an impact on the total amount paid. As stated under "Component 1 – the commodity price" of the Netherlands, low caloric natural gas is used, except in around 80 industrial companies, the assumption is made that the profiles G-RES and G-PRO use low caloric natural gas. To determine our profiles' tax categories, we use the same conversion factor of 9,77 kWh/m³ mentioned previously.

Given the consumption level of our profiles understudy, G-RES profile falls into band 1 and G-PRO profile can be spread across band 1 and band 2.

[183] https://www.vattenfall.nl/grootzakelijk/energiebelasting/tarieven/
[184] Rijksoverheid Nederland (2023), https://www.rijksoverheid.nl/onderwerpen/milieubelastingen/energiebelasting
[185] ibid

Component 4 – VAT

A temporary reduction on the VAT rate for natural gas has been agreed for six months during the second part of the year (with a reduced rate of 9% for July to December 2022). This reduction was valid to all households, thus applying also to low-income ones. This measure is however not applicable anymore in 2023 and is back to its previous level since 1st January 2023[186].

Price cap for natural gas in 2023

In 2023, a price cap will apply for natural gas as a temporary measure to protect households and other small-scale users from an uncontrolled natural gas price increase. In concrete terms, for up to 1.200 m³ of natural gas used during the whole year, a maximum rate of 1,45 EUR/m³ will apply in 2023.[187]

This new scheme applies to small-scale users, defined as "everyone with a regular energy connection, like households, small businesses and community associations. The building with the connection must be designated as a home or workplace, however." The price cap also applies to SMEs with a regular connection.[188]

[186] https://www.expat-check.com/news/the-energy-bill-in-2023-will-look-completely-different/#:~:text=The%20energy%20tax%20reduction%20will,than%2015%20euros%20per%20month.

[187] https://www.government.nl/topics/energy-crisis/cabinet-plans-price-cap-for-gas-and-electricity#:~:text=In%202023%2C%20the%20following%20maximum,m3%20of%20natural%20gas%20used

[188] ibid

The UK

Component 1 – the commodity price

In the UK gas suppliers generally present all-in prices that are not transparent. These prices consist of:

- The Standing Charge (fixed element), which is expressed in p/day and that covers the fixed costs of the energy supplier and;
- Unit Rate Charge (variable element), which is expressed in p/kWh and that varies according to the energy consumption.

Since we only want the commodity price in this section, we had to deduct network charges, taxes and VAT from these 'all-in prices'. Commodity prices of a supplier are not very different between regions, and for the sake of simplicity, the commodity price of only one region is used for all 8 DSO regions. An Ofgem study from 2015[189] analysed the costs throughout the different areas, and out of this study, Yorkshire appeared to be the median zone in terms of commodity price. For this reason, the selected products come from the Yorkshire region. The network cost, VAT and taxes are deducted from the all-in prices of the Yorkshire region. Like other countries in review, the weighted average of network prices for all DSOs are used to determine the network cost.

The HHI of the retail market in the UK is between 1.000 and 2.000 in 2021, meaning that four products should normally be considered: the standard product of the market incumbent, the cheapest product on the market, the cheapest product of the market incumbent and the cheapest product of the second-largest supplier. Where the CREG provided PwC with the products and prices for the UK G-RES profile in the 2022 update, for 2023 this was not the case. For this reason, the energy providers' websites were directly consulted to retrieve the necessary information.

Due to the energy price guarantee place in the UK, there was however only a limited number of products currently offered by UK suppliers, and the price variance among them is close to null. For this reason, it was not possible to retrieve the cheapest product of the second-largest supplier (as there was only one product available). We therefore limited our selection to 3 products that can still be considered as representative of the whole UK market in February 2023.

Due to the current situation observed, the same weight (33,33%) is attributed to the 3 products.

Table 71: Weight for each product in the UK

Product	Weight G-RES
Standard product of the market incumbent	33,33%
Cheapest product on the market	33,33%
Cheapest product of the market incumbent	33,33%

On the one hand the energy price cap sets a maximum price cap that energy providers can charge consumers for each kWh used. This cap considers all costs components (commodity costs, network costs, policy costs, supplier operating costs and VAT). On the other hand, the energy price guarantee is a measure that guarantees householders would pay on average £2,500 on their energy bill until the end of March 2023. For January 2023 the equivalent per unit level for a typical gas consumer was £0,17/kWh with a standing charge of £0,28/day.[190]

[189] (OFGEM, 2015)

[190] https://www.ofgem.gov.uk/publications/latest-energy-price-cap-announced-ofgem

An overview of the products and their respective pricing elements are presented in the table below, but these still include the network costs and taxes. It is important to mention that the standard products in the UK are governed by the energy price cap, introduced by market regulator Ofgem in 2019 with the objective of reducing the impact of an increase of energy costs on final consumers.

Table 72: Annual cost of selected products for profile G-RES in the UK

Region	Supplier – Product	Fixed component (EUR/year)	Variable price based on consumption (EUR/year)
The UK	British Gas – Standard Variable Tariff	111,82	2.714,49
	Octopus Energy – Flexible Octopus October 2022 v1	105,36	2.713,43
	E.ON – Next Flex	111,80	2.713,43

The commodity price of the G-PRO profile was provided by the CREG. The national commodity price is the result of January 2023 prices.

Component 2 – network costs

Transport costs

Only one TSO, excluding the Northern Islands, operates in the UK: National Grid Gas. The Gas Transmission Transportation Charges are comprised of the following components:

Table 73: Transport costs components in the UK

Network costs (transport)	
Component	**Explanation**
Entry Commodity Charge	A charge per unit of natural gas transported payable for flow entering the system in p/kWh/day
Exit Commodity Charge	A charge per unit of natural gas transported payable for flow exiting the system in p/kWh/day
Commodity charge	A charge per unit of natural gas transported payable for flows entering and exiting the system in p/kWh

National Grid Gas provides a weighted average of the entry and exit capacity tariffs in their Statement of Gas Transmission Transportation Charges[191].

[191] We have used the weighted averages published in the Gas Transmission Transportation Charges of the NGG valid as from the 1st of April 2020, (Nationalgrid, 2020).

Distribution costs

Both of our residential and small professional profiles (G-RES and G-PRO) must pay distribution tariffs since they are connected to the distribution grid. There are eight natural gas DSOs in the UK, out of which 4 are run by Cadent Gas. The distribution tariff for natural gas is composed of the following components:

Table 74: Distribution costs for residential users and small professionals in the UK

Network costs (distribution)		
Component	**Explanation**	**Profile**
LDZ System Capacity Charge	With charge band for consumption up to 73.200 kWh, calculated using the supply point End User Category (EUC) and the appropriate load factor in p/kWh.	G-RES
	With charge band between 73.200 and 732.000 kWh, calculated using the supply point End User Category (EUC) and the appropriate load factor in p/kWh.	G-PRO
LDZ System Commodity Charge	With charge band for consumption up to 73.200 kWh, calculated using the supply point End User Category (EUC) and the appropriate load factor in p/kWh.	G-RES
	With charge band between 73.200 and 732.000 kWh, calculated using the supply point End User Category (EUC) and the appropriate load factor in p/kWh.	G-PRO
LDZ Customer Capacity Charge	With charge band for consumption up to 73.200 kWh, it is a capacity charge in p/Peak day kWh/day.	G-RES
	With charge band between 73.200 and 732.000 kWh, a fixed charge which depends on the frequency of meter reading, plus a capacity charge based on the registered SOQ.	G-PRO
LDZ Customer Fixed Charges	Only due for supply points with annual consumption between 73.200 and 732.000 kWh/year	G-PRO
Exit Capacity Charges	Capacity charge applied to the supply point like LDZ System Capacity Charge. These charges are applied per exit zone on an administered on peak day basis in GBP/year.	G-RES and G-PRO
Metering charges	Cost for use and management of your energy meter in GBP/year.	G-RES and G-PRO

The capacity terms are based on the estimated maximum daily offtake. This is calculated by dividing the total consumption in a year by the number of days of consumption multiplied by the load factor. This load factor is related to the EUC (End User Category) bands. Each local distribution zone has 33 individual EUC bands that define 9 different consumption profiles based on annual consumption.

The load factors differs depending on the annual consumption of a profile and the local distribution zone. Each DSO has its own load factor percentages, but only Northern Gas Networks discloses its load factors, which we used as a proxy for all other DSOs. The table below depicts the load factors used for profiles G-RES and G-PRO:

Table 75: Load factors for profiles G-RES and G-PRO

Profile	Bands	Threshold (kWh)	Average load factor
G-RES	1	1 – 73.200	34,00%
G-PRO	2	293.001 – 732.000	38,4%

Based on this, the capacity term is computed as follows:

$$annual\ charge = (SOQ * 365\ days) * unit\ rate$$

Where,

$$SOQ = annual\ consumption/(365\ days * Load\ Factor)$$

We considered a weighted average of these components across four active DSOs for natural gas in the UK.

Component 3 – all other costs

Two additional costs are applicable on natural gas in the UK:

(1) Energy suppliers need to account for the cost of the **Energy Company Obligation (ECO)** scheme, which helps to reduce carbon emissions and tackle energy poverty. This ECO scheme "has seen 4 iterations, ECO, ECO1, ECO2 and ECO3 […]. The ECO3 scheme closed on 31 March 2022 and the ECO4 Order came into force in July 2022. ECO4 applies to measures installed from 1 April 2022 and will cover a four-year period until 31 March 2026.[192] The cost of the ECO scheme represents, according to Ofgem, around 2,50% of the natural gas invoice.[193]

(2) The **Climate Change Levy** (CCL) is applicable to the consumption of electricity and natural gas for businesses in the industrial, public services, commercial and agricultural sectors. This levy is "an environmental tax charged on the energy that businesses use. It's designed to encourage businesses to be more energy efficient in how they operate, as well as helping to reduce their overall emissions."[194]

The following table gives an overview of the rates that are charged to professional consumers regardless of their profile (Residential consumers are exempted from it[195]):

Table 76: Climate Change Levy rates on natural gas[196]

Time period	Natural gas rate (GBP)
1st April 2022 to 31st March 2023	0.568p/kWh
1st April 2023 to 31st March 2024	0.672p/kWh
1st April 2024 to 31st March 2025	0.775p/kWh

Component 4 – VAT

VAT on the consumption of natural gas in the UK amounts to 5% for residential consumer.

[192] https://www.ofgem.gov.uk/environmental-and-social-schemes/energy-company-obligation-eco

[193] As no exact price could be identified for this cost, a proxy derived from OFGEM's website is used. We consider ECO to account for the full weight of Environmental and Social Costs component as estimated by OFGEM. https://www.ofgem.gov.uk/consumers/household-gas-and-electricity-guide/understand-your-gas-and-electricity-bills (OFGEM, 2020)

[194] https://www.sefe-energy.co.uk/help-and-support/bills-payments/what-is-the-climate-change-levy-ccl/

[195] (GOV.UK, 2020)

[196] ibid

5. Large industrial consumers

5. Large industrial consumers

This chapter aims at providing an extensive introduction to the prices, price components and the assumptions taken for each country and region with a particular focus on industrial consumers of electricity (E0 to E4) and natural gas (G0 to G2).

Electricity

Electricity: Detailed description of the prices, price components and assumptions

For all countries under review, this section details:

1. **Commodity costs** for profiles E0, E1, E2, E3 and E4
2. **Network costs** for profiles E0, E1, E2, E3 and E4
3. **All other costs** for profiles E0, E1, E2, E3 and E4

Profile	Consumption (MWh)	Connection capacity (kVA)
E0	2.000	781
E1	10.000	3.125
E2	25.000	6.944
E3	100.000	18.056
E4	500.000	86.806

Belgium

Component 1 – the commodity price

Commodity prices computation rests on market prices and reflect the cost of electricity for industrial consumers as of January 2023. The underneath commodity formula is used for each profile and is based on an analysis performed by the CREG of all Belgian consumers contracts with a yearly consumption higher than 10 GWh. For E0, E1 and E2, CREG did not include weekend hours of Belpex DAM, while for E3 and E4 CREG included weekdays and weekend hours.

$$\textit{Commodity price} = 36.5\%\,CAL\,Y_{-1} + 27.4\%\,CAL\,Y_{-2} + 21.4\%\,CAL\,Y_{-3} + 8.2\%\,Qi_{-1} + 4.2\%\,Mi_{-1} + 2.3\%\,Belpex\,DAM$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two years ahead forward price in 2021
CAL Y_{-3}	Average three years ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

Component 2 – network costs

Transmission cost

Whether connected to the transmission grid 30-70 kV (Local Transmission System) – profile E2 - or to the transmission network itself – profiles E3 and E4 -, the same transmission tariff structure applies to all our industrial profiles under review in this study. However, in the function of the voltage connection, different rates apply.

The transmission costs in Belgium are fixed by Elia Transmission Belgium and consists of five components:

(1) **Connection tariffs**: charges to operate and maintain the user connection for consumers directly connected to Elia's grid (from E2).[197]

(2) **Tariffs for the operation and the development of the grid infrastructure**: including (i) the tariff for the monthly peak for the offtake, (ii) the tariff for the yearly peak for the offtake and (iii) the power put at disposal.

(3) **Tariffs for the operation of the electric system**: including (i) the tariff for the management of the electric system and (ii) tariffs for the offtake of additional reactive energy (not considered).

(4) **Tariffs for the compensation of imbalances**: including (i) the tariff for the power reserves and black-start and (ii) the tariff for the maintenance and restoring of the residual balance of the individual access responsible parties. The latter includes (a) imbalance tariffs, which are not considered as they are (generally) not explicitly billed by the TSO or by suppliers to end consumers and (b) network losses. Network losses on the federal transmission grid (380/220/150 kV) are a separate and additional component of transmission tariffs. Suppliers usually bill these costs as a percentage (fixed every year by the TSO) of the commodity cost. While the costs associated with network losses is not a transmission tariff as such, it is deemed a part of the transmission cost in this study. Over the last 3 years, the contributions for future expected losses on the grid have increased from 1.35% to 1.80% (prevision of future losses – "volume effect")[198] and the unit commodity price having also increased during the same period ("price effect"), this explains in part the increase in the network costs in Belgium. The network tariffs as approved by the CREG, are on their end relatively stable over the last three years.

    Note that for consumers connected to the distribution grid, Flanders integrates network costs as a distribution component as we later detail.

(5) **Tariffs for market integration**: Elia Transmission Belgium provides services such as the development and integration of an effective and efficient electricity market, the operation of interconnections, coordination with neighbouring countries and the European authorities and publication of data as required by transparency obligations. The costs that come from these services are covered by the market integration tariff.

As profiles E0 and E1 remain connected to the distribution grid, transmission costs are charged based on DSOs transmission price sheets in Brussels and Wallonia. As from January 2023, transmission tariffs are included in the DSO's distribution tariff sheets in Flanders, for these profiles, split under the following two components: "tarieven voor het netgebruik" and "tarieven m.b.t. overage transmissienetkosten". Further explanation on the latter can be retrieved in the Transmission cost of the residential profiles.

[197] This cost depends on the distance between the connection bay and the consumer. We have taken the assumption that this is 500 meters.
[198] (Elia, 2023)

As the table below sets out, regional regulators adopt transmission tariffs on different dates, with Wallonia being deferred compared to Brussels. As this study analyses the tariffs in force in February 2023, the CWaPE tariff to be used is the one effective for the period ranging from 1st March 2022 to 28th February 2023.

Table 77: Adoption date of new tariffs by regional DSOs in Belgium (Large indus. consumers)

Name of the DSO	Effective date
BRUGEL	1 January 2023
CWaPE	1 March 2022

Since January 2023, Flanders integrated the transmission costs within the distribution tariff components (as explained above). The tariff related to transmission costs is computed based on the budgets of the DSOs for the transmission costs, on a yearly basis and renewed every year on the 1st of January.

Distribution costs

As part of our industrial consumers, 2 profiles (namely E0 and E1) are connected to the distribution grid. Consequently, they are also subject to distribution tariffs, which must be added to the transmission tariffs. Voltage level networks have been determined to both industrial profiles connected to the distribution grid as illustrated below.

Table 78: Voltage level for industrial profiles in Belgium

Profiles	Brussels	Flanders	Wallonia
E0	1-26 kV	1-26 kV Hoofdvoeding	MT Avec mesure de pointe
E1	Trans MT	Trans-HS Hoofdvoeding	T-MT Avec mesure de pointe

Distribution tariffs from all regions have one similar component: tariff for the use of the distribution grid. For both E0 and E1, such component is decomposed as follows.

Table 79: Tariff for the usage of the distribution grid in Belgium

Brussels	Flanders	Wallonia
Capacity term (EUR/kW)	Capacity term (EUR/kW and EUR/kVA)	Capacity term (EUR/kW)
Proportional term (EUR/kWh)	-	Proportional term (EUR/kWh)
Fixed term (EUR/Year)	-	Fixed term (EUR/Year)

Brussels assesses its capacity term based on consumers' annual peak, Wallonia considers the annual and monthly peaks. The former is considered as the peak over the last 11 months before the invoicing month and make up for 75% of the component while monthly peak, the remaining 25%, is determined as the peak of the invoicing month.

As from the 1st of January 2023, Flanders has adopted a new distribution tariff structure, with significant changes for all network users. For the E0 and E1 profiles, the capacity term, which was based on the annual peak until 2022, is now based for 50% on the monthly peak and for 50% on the contracted capacity which can be set by each network user. Penalties apply if the network user exceeds his contracted capacity. There is no more proportional term in this tariff component.

Additional components are part of distribution tariffs, as described in the following table.

Table 80: Additional components for Belgian industrial consumers

Brussels	Flanders	Wallonia[199]
Metering costs	Tariff of data management[200]	Regulatory balances
-	Tariff for other transmission costs[201]	-

As tariffs differ from region to region and from DSO to DSO, a weighted average is computed. Each DSO's weights are determined according to the number of EAN connections[202] owned by each DSO. While we consider all DSOs operated by Fluvius in Flanders, accounting to 100% of EAN connections, we also consider all DSOs from Wallonia (100% of EAN connections).

Component 3 – all other costs

In Belgium, three different kinds of extra costs apply to electricity: tariffs for Public Service Obligations (PSO), taxes and levies, certificate schemes and other indirect costs. These costs are summarised below with a distinction between common costs to all three Belgian regions and the one's specific per region. It is to be noted that federal charges are levied by the suppliers, and regional charges are levied by regional DSOs. Tariff rates are mentioned when they do not vary depending on the consumer profile and/or the DSO; otherwise, units in which they are expressed are detailed:

Table 81: Other costs for industrial electricity consumers applying in all three Belgian regions

All regions	Profiles
Regional Public Service Obligations (Regional PSOs)	
Regional PSOs on distribution[203]	
a. A general tariff for regional PSOs (expressed in EUR/MWh)	E0 and E1
Taxes and levies on the federal level	
a. Special excise duty	All

[199] Charges for metering activities in Wallonia are built in tariffs for the use of the distribution grid.

[200] In 2019, the Flemish regulator conferred Fluvius the role of data manager with a view to the roll-out of the digital meter, among other things. The activities to be performed by the data manager concern data recorded by all types of meter, not only digital meters, but also analogue and electronic meters. The costs of all these activities will be charged as of 2021 via the data management tariff which replace the metering costs.

[201] Note that only 76,77% of this tariff is included in the network cost component presented in this report, as this is the share related to the former transmission network tariff components that have been integrated in this new tariff component since 2023: tariff for market integration, tariff for the management of the electric system, tariff for power reserves and black start. The remaining 23,23% of this tariff component is included in the “all other cost” component.

[202] EAN (European Article Numbering) is a unique code attributed to meters and which indicates a supply point for electricity or natural gas.

[203] For each region of Belgium, we compute the tariff through a weighted average of each component across all DSO active in the region (weights are given in terms of number of EAN connection per DSO).

The table below shows the tax rates applied as of 2023 at the Federal level in Belgium for all commercial profiles. It must be noted that the special excise duty had been temporarily decreased from 1st November 2022 to 31st March 2023 for professional use on consumption up to 1.000 Mwh[204]. As from April 2023, structural measures of VAT reduction and adapted excise duty will apply.

Table 82: Special excise duty in Belgium for Electrical commercial consumers – standard rate

Yearly consumption	Tax for professional profiles (EUR/MWh)
Consumption up to 20 MWh	0,50
Consumption between 20 - 50 MWh	0,50
Consumption between 50 - 1.000 MWh	0,50
Consumption between 1.000 – 25.000 MWh	10,69
Consumption between 25.000- 100.000 MWh	2,73
Consumption above 100.000 MWh	0,50

According to Art. 429.§ 1er of the law from 27th December 2004[205] an exemption is foreseen when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures. For the sake of this report, we assumed that profiles E1 to E4 could potentially benefit from this exemption, if they fall within the conditions specified by the law.

[204] https://www.ey.com/en_be/tax/tax-alerts/2022/monthly-customs-and-excise-update-december-2022
[205] https://www.ejustice.just.fgov.be/eli/loi/2004/12/27/2004021170/justel

Table 83: Regional other costs for industrial electricity consumers[206]

Brussels	Flanders	Wallonia	Profiles
Regional Public Service Obligations (Regional PSOs)			
Regional PSOs on transmission			
a. Financing of regional energy policies[207] (7,62 EUR/month or 1,06 EUR/kVA) (E0 to E2)	a. Financing of support measures for renewable energy and cogeneration [208] (1,4655 EUR/MWh) (E2 only)	a. Funding of support measures for renewable energy[209] (1,5564 EUR/MWh)	E0, E1 and E2
b. Levy compensating for the use of public highways[210] (4,0837 EUR/MWh) (from E1)	b. Financing measures for the promotion of rational energy use[211] (0,0392 EUR/MWh) (E2 only)	-	
Taxes and levies on the regional level			
Regional taxes and levies on distribution			
a. Charges on non-capitalised pensions (0,174 - 0,259 EUR/MWh)	a. Contribution for the energy fund[212] (181,85 - 1060,83 EUR/month)[213] (all profiles)	a. Levy for occupying road network (2,872 - 2,981 EUR/MWh)	E0 and E1
b. Levy for occupying road network (3,621 EUR/MWh)	b. Surcharges for distribution [214] (0,0102 - 0,1918 EUR/MWh)	b. Corporate income tax (2,199 – 2,392 EUR/MWh)	
c. Corporate income tax and other taxes (0,474 - 1,93 EUR/MWh)	c. Other transmission costs related to regional PSOs, taxes and levies on transmission (0,9393 EUR/MWh)[215]	d. Other local, provincial, regional, and federal taxes, Charges, Surcharges, Fees, and contributions (0,053 - 0,064 EUR/MWh)	
Regional taxes and levies on transmission			
-	a. Levy for the taxes pylons and trenches in Flanders (0,4162 in EUR/MWh)[216] (only E2, E3, E4)	a. Connection fee (0,075 EUR for the first 0,100 MWh; 0,3 - 0,75 in EUR/MWh above 0,1 MWh)	All
-	-	b. Levy for the use of the public domain (0,4018 EUR/MWh) (E2)	

206 The tariffs represented in this table vary depending on the DSO and we have thus chosen to only present the minimum and maximum range of the tariff from the largest (or only) DSO of the region. Sibelga for Brussels, Imewo for Flanders and ORES Hainaut for Wallonia.

207 (Sibelga, 2020)

208 For E0 and E1, this cost component is integrated in the “tariff for other transmission cost” component of the distribution tariff.

209 In Wallonia a partial exemption of 85% applies for holders of a sectoral energy efficiency agreement, meaning that to the E-BSME profile can profit from this reduction.

210 (Sibelga, 2020)

211 For E0 and E1, this cost component is integrated in the “tariff for other transmission cost” component of the distribution tariff.

212 (Vlaamse Overheid, sd)

213 Retrieved from https://www.vlaanderen.be/bijdrage-energiefonds-heffing-op-afnamepunten-van-elektriciteit/tarief-van-de-bijdrage-energiefonds

214 The distribution tariff sheets from the DSOs do not include more levels of details regarding the surcharges.

215 215 All regional PSOs, taxes and levies that are passed on from the transmission system operator to the distribution system operators are integrated in the “tariff for other transmission costs” component of the distribution tariff in Flanders since 2023. They are calculated as accounting for 23,23% of the “other transmission cost” tariff component.

216 (Elia, 2021). Only for E2, E3 and E4. For E0-E1, the costs of this tariff are integrated in the "tariff for other transmission cost" component of the distribution tariff (see cell above in the table).

Because of the regional quota for green certificates (all regions) and combined heat/power-certificates (only Flanders), there are some indirect costs that are added on the commodity price. The average market price of the certificates over the last 12 months, which means for 2023 from 1st of January 2022 until 31st of December 2022, is considered to estimate the cost of this mechanism. The average values for each region considered are presented in the table below and are based on figures retrieved from the respective regional regulators. To estimate the cost of this mechanism, we also consider the quotas and some associated reductions.

Table 84: Certificate schemes in each Belgian region

Region	**Price & Description**	
Average price of certificate schemes		
Flanders (GC)	94,71 EUR/GC	
Wallonia (GC)	67,50 EUR/GC	
Brussels (GC)	91,67 EUR/GC	
Flanders (CHPC)	23,98 EUR/CHPC	
Certificate schemes		
Brussels	Green certificates	The quota increases every year. As opposed to Flanders and Wallonia, no reduction applies for large industrial consumers in Brussels.
Flanders	Green certificates	Since the introduction of the green certificates, the quota has increased yearly (except in 2018). Between 2019 and 2023, there was no quota change. Starting from 2024, the quota will yearly decrease yearly until 2028.[217] [218] Flanders also applies progressive quota reductions for large consumers. Part of these reductions are only applicable to large consumers active in certain electro-intensive sectors. Starting from 2023, Flanders applies quota reductions for stand-alone battery systems.
	Combined heat/power certificates	Flanders is the only region that also has these certificates. As seen with the green certificates, the quota also increased every year from introduction to 2016 but will remain steady until 2025, after which the quota will temporarily increase until 2031.[219] Similar to the GC there are also progressive quota reductions for large consumers, partly limited to large consumers active in certain electro-intensive sectors[220]. Starting from 2023, Flanders also applies quota reductions for stand-alone battery systems.
	Cap on GC and CHPC	As of 2019 two caps on green certificates were introduced for certain industrial consumers. However, starting 2021 these have been replaced by a cap combining GC and CHPC: [221] i. The amount due for the costs related to the financing of renewable energy and qualitative combined heat and power is capped at 0,5% of gross value added (average last 3 years) for all consumers with an electro-intensity over 20% for consumers belonging to sectors that are listed in annexes 3 and 5 of the EEAG; ii. The amount due for the costs related to the financing of renewable energy and qualitative combined heat and power is capped at 4% of gross value added (average last 3 years) for all consumers belonging to sectors that are listed in annexe 3 of the EEAG.
Wallonia	Green certificates	The quota has increased every year. Progressive quota reductions apply to large consumers, reinforced by the new regional decree that entered into force on July 1st, 2014. These reductions apply for consumers that have contracted a sectoral agreement and we consider that these reductions only apply from consumer profile BSME.
Computation		
The cost of the GC and CHPC scheme is easily computed by multiplying the average yearly consumption by the average market price of the certificates weighted by the quota. The quota and GC (and CHPC) cost depend on the region. Wallonia and Flanders also have a reduction on quota that must be considered for GC (and CHPC).		

[217] Art. 7.1.10 § 2 Energiedecreet
[218] Art. 7.1.10 § 2 Energiedecreet
[219] Art. 7.1.11 § 2 Energiedecreet
[220] (Elia, 2018)
[221] Art. 7.1.11/1 Energiedecreet; The companies listed in Annexe 3 and 5 of EEAG correspond to the companies listed in the Energiedecreet except for Nace 3832 (Recycling of waste) which is listed in Annexe 3 EEAG but not in the Energiedecreet.

Germany

Component 1 – the commodity price

Commodity prices computation rests on market prices and describes the cost of electricity for industrial consumers as of January 2023. The underneath commodity formula is used for each profile and is based on an analysis performed by the CREG of all Belgian consumers contracts with a yearly consumption higher than 10 GWh The EEX Futures and EPEX DAM prices are the national indexes employed in the computation. For profiles E0, E1 and E2, we use all hours apart from weekends of EPEX SPOT DE DAM, while for profile E3 and E4, we utilise all hours of EPEX SPOT DE DAM.

Commodity price

$$= 36.5\%\, CAL\ Y_{-1} + 27.4\%\, CAL\ Y_{-2} + 21.4\%\, CAL\ Y_{-3} + 8.2\%\, Qi_{-1} + 4.2\%\, Mi_{-1} + 2.3\%\, EPEX\ Spot\ DE$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two year ahead forward price in 2021
CAL Y_{-3}	Average three year ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

Component 2 – network costs

The German electricity market differs from the Belgian one. The four TSOs exclusively operate on the (extra-) high voltage grid and all lower voltage levels are operated by DSOs (often up to 110 kV).

Our profiles are connected to different voltage levels, and different tariffs thus apply. The profiles are associated with the appropriate voltage level in the following table:

Table 85: Connection voltage for each consumer profile

<table>
<tr><th>Connection voltage (U_n)</th><th>Voltage profile</th><th>Consumer profile</th><th>Grid operator</th></tr>
<tr><td rowspan="3">1 kV ≤ Un ≤ 50 kV</td><td rowspan="3">Medium voltage</td><td>E0</td><td rowspan="4">DSO</td></tr>
<tr><td>E1</td></tr>
<tr><td>E2</td></tr>
<tr><td>Un = 110 kV</td><td>High voltage</td><td>E3</td></tr>
<tr><td>220 kV < Un ≤ 350 kV</td><td>Extra-High voltage</td><td>E4</td><td>TSO</td></tr>
</table>

German prices are disclosed as integrated tariffs both for transmission and distribution, thereby offering less view on the bill components. As described in the dataset, all four transmission zones are represented, but since Germany counts more than 800 DSOs[222], a weighted average of two DSOs (one rural and one urban) per zone is presented.

[222] (European Commission, 2010)

Transmission cost

Like Belgium, the German integrated transmission fees involve three main components:

Table 86: Components of German transmission costs

Transmission costs		
Component	**German label**	**Explanation**
Capacity charge	Leistungspreis	Depends upon the maximum capacity in kW contracted, expressed in EUR/year.
Consumption charge	Arbeitspreis	Depends upon the volume of energy consumed in kWh per year, expressed in cEUR/kWh/year.
Metering costs	Messstellenbetrieb	Charges related to the cost of metering and invoicing; fixed prices expressed in EUR/year.

Since it is assumed that load profiles do not exceed their contracted capacity, no other fees such as capacity excess fees are considered

When annual consumption exceeds 10 GWh, important transmission network costs reductions can apply on large industrial consumers. Users with a very abnormal load profile (case by case)[223] get a reduction of max. 90%. Moreover, users who exceed 7.000 consumption hours[224] a year, benefit from reductions, as shown in the table below:

Table 87: Grid fee reduction conditions

Annual consumption	Annual offtake hours	Grid fee reduction
>10 GWh	≥ 7.000 hours	- 80%
> 10 GWh	≥ 7.500 hours	- 85%
> 10 GWh	≥ 8.000 hours	- 90%

These reductions apply to profiles E3 and E4. We assumed that Profile E3 has a profile of 7.692 hours and pays consequently, only 15% of the grid fee, while this is only 10% for profile E4 (8.000 consumption hours). The costs can be allocated pro-rata to final consumers as a surcharge on network charges. Other profiles do not qualify for the following reasons:

- Profile E-BSME and E0 do not consume 10 GWh in addition to reaching fewer offtake hours, respectively 1.600 hours and 4.000 hours.
- Profile E1 and E2 do consume 10 GWh or more, but their offtake hours are lower (5.000 hours).

Distribution costs

Distribution costs follow an identical pricing methodology as for the transmission grid with similar terminology. Tariffs are also composed of three elements: capacity charge (i.e. “Leistungspreis”), consumption charge (i.e. “Arbeitspreis”) and the metering costs (“Messstellenbetrieb”). The tariffs may differ on price or range of maximum capacity contracted and electricity consumed.

[223] (Bundesamt für Justiz, 2021)
[224] See definition in section 0. Consumer profiles.

Component 3 – all other costs

When it comes to German taxes and levies, the case is somewhat more complicated with many exemptions, progressive reductions, and various rates. As stated in the section "3.1 General assumptions", we expect the consumer to behave in an economically rational manner aiming at the lowest tax rate. Whenever the application of reductions or exemptions depends on economic criteria, not under the full control of the user (energy cost/turnover, energy cost/gross value added, pension payments etc.), we present a range of possible options.

We counted six taxes or surcharges that apply on electricity in Germany:

1. The "*KWKG-Umlage*" – Kraft-Wärme-Kopplungsgesetz or Combined Heat and Power Act – is a tax contributing to CHP-plant subsidies. The present forecast data of DSOs and the Federal office for Economic Affairs and Export - Bundesamt für Wirtschaft und Ausfuhrkontrolle shorten by BAFA – represent the backbone of the computations. There is a specific rate for consumers under certain conditions, below detailed. This applies to all profiles from E0 to E4.

Table 88: KWKG-Umlage tax in Germany[225]

Category	Consumer group	Rates
Category A	All other consumers	**3,57 EUR/MWh**
Category B	If consumption > 1 GWh / year and electricity cost is: • For an extensive list of industrial sectors (annexe 3 of EEAG)[226]: >17% of gross value added [227]	**0,536 EUR/MWh** (85% reduction) but capped[228] at 0,5% of gross value added (average last three years) for all consumers with electricity cost >20% of gross value added
	If consumption > 1 GWh / year and electricity cost is: • For a less extensive list of industrial sectors (annexe 5 of EEAG): >20% of gross value added	**0,536 EUR/MWh** (85% reduction) but capped at 4,0% of gross value added (average last three years) for all consumers with electricity cost
Category C	If consumption > 1 GWh / year and electricity cost is: • For an extensive list of industrial sectors (annexe 3 of EEAG)[229]: between 14 and 17% of gross value added (avg. last three years)	**0,714 EUR/MWh** (80% reduction) but capped[230] at 0,5% of gross value added (average last three years) for all consumers with electricity cost >20% of gross value added
		0,714 EUR/MWh (80% reduction) but capped[231] at 4,0% of gross value added (average last three years) for all consumers with electricity cost

A **bottom rate of 0,30 EUR/MWh** exists that can benefit some consumers from category B and C. The KWKG bottom rate applied for taxes does not vary depending on the activity sector of the consumer. Regarding our reviewed profiles (E0 to E4), we display a range from the bottom rate to the category C rate for electro-intensive consumers. As for non-electro-intensive consumers, we consider a maximum price based on category A rates.

[225] https://www.en-apolda.de/resources/strom/strom-entgelte/s-neg-03.pdf

[226] (European Commission, 2014-2021)

[227] The notion of gross value added is defined in Annexe 4 of the Environmental and Energy State Aide Guidelines, Communication C200/50 of the European Commission. (European Commission, 2014-2021)

[228] However, these caps are only applicable if the consumer is part of an energy efficiency system improvement program.

[229] (European Commission, 2014-2021).

[230] However, these caps are only applicable if the consumer is part of an energy efficiency system improvement program.

[231] However, these caps are only applicable if the consumer is part of an energy efficiency system improvement program.

2. The "StromNEV", or Electricity Network Charges Ordinance, based on the regulation of charges for access to electricity networks § 19, is a digressive levy to compensate for §19 transmission tariff reductions. Again, different rates apply to the respective following categories:

Table 89: StromNEV tax in Germany

Band	Electricity offtake	Rates
Band A	Offtake ≤ 1 GWh/year	**4,17 EUR/MWh**
Band B	Offtake > 1 GWh /year	**0,50 EUR/MWh**
Band C	Offtake > 1 GWh/year and manufacturing industry with electricity cost > 4% of turnover	**0,25 EUR/MWh**

For all profiles understudy, we display two possibilities: the consumer can benefit from the Band C rate for his offtake above 1 GWh with the bottom range, or he does not qualify for the given conditions, in which case Band B rate applies for his offtake above 1 GWh and with top range on offtakes up to 1 GWh.

3. The "Offshore-Netzumlage", or Offshore Network Levy, is a levy to pay for offshore wind power generation units. Several rates apply depending on the band they fall into which depends on the total electricity offtake in a similar way we have seen for the KWKG/CHP surcharge.

Table 90: Offshore-Netzumlage tax in Germany

Category	Consumer group	Rates
Category A	All consumers that do not belong to category B or C	**5,91 EUR/MWh**
Category B	If consumption > 1 GWh / year and electricity cost is: • For an extensive list of industrial sectors (annexe 3 of EEAG)[232]: >17% of gross value added [233]	**0,887 EUR/MWh** (85% reduction) but capped[234] **at 0,5% of gross value added** (average last three years) for all consumers with electricity cost > 20% of gross value added
	If consumption > 1 GWh / year and electricity cost is: • For a less extensive list of industrial sectors (annexe 5 of EEAG): >20% of gross value added	**0,887EUR/MWh** (85% reduction) but capped[235] **at 4,0% of gross value added** (average last three years) for all consumers with electricity cost < 20% of gross value added
Category C	If consumption > 1 GWh / year and electricity cost is: • For an extensive list of industrial sectors (annexe 3 of EEAG) [236]: between 14 and 17% of gross value added (avg. last three years)	**1,182 EUR/MWh** (80% reduction) but capped[237] at 0,5% of gross value added (average last three years) for all consumers with electricity cost > 20% of gross value added
		1,182 EUR/MWh (80% reduction) but capped[238] at 4,0% of gross value added (average last three years) for all consumers with electricity cost < 20% of gross value added

[232] (European Commission, 2014-2021).
[233] The notion of gross value added is defined in Annexe 4 of the Environmental and Energy State Aide Guidelines, Communication C200/50 of the European Commission. (European Commission, 2014-2021)
[234] However, these caps are only applicable if the consumer is part of an energy efficiency system improvement program.
[235] However, these caps are only applicable if the consumer is part of an energy efficiency system improvement program.
[236] (European Commission, 2014-2021).
[237] However, these caps are only applicable if the consumer is part of an energy efficiency system improvement program.
[238] However, these caps are only applicable if the consumer is part of an energy efficiency system improvement program.

A bottom rate of 0,30 EUR/MWh exists that can benefit some consumers of the EEG for the Offshore-Netzumlage (Offshore Network Levy).

Regarding our reviewed profiles (E0 to E4), we display a scope from the bottom rate to the category C rate for electro-intensive consumers. As for non-electro-intensive consumers, we consider a maximum price based on category A rates.

The “EEG-Umlage” – Erneuerbare-Energie-Gesetz or Renewable Energy Act – is a contribution to the renewable energy financing other than offshore wind power generation units. This levy was abolished by law in January 2023. As stated earlier, the financing of the promotion of renewable energies will be carried out by the federal budget.

4. The “Stromsteuer”, or Electricity tax, as its translation shows, is a tax on electricity. The standard rate is 20,50 EUR/MWh, remaining unchanged since 2003 (Bundesamt für Justiz, 2021). All applying industrial consumers benefit from a 15,37 EUR/MWh rate, which represents a 25% reduction. Initially implemented to fund employees’ pensions, companies may be granted important reductions whether they do not contribute much because of a low number of employees.

   The maximum reduction rate that can be reached is 1,537 EUR/MWh with a 90% reduction. Since 2015, the implementation of this reduction, also called ‘Spitzenausgleich’ depends on the countrywide effort regarding energy efficiency goals239. In 2019, 5.488 companies benefit from a reduction through this system240.

   Apart from these cutbacks, electricity as a raw material for electro-intensive industrial processes is entirely exempted from electricity tax (Stromsteuer). Furthermore, for all profiles, we exhibit a scope from 0 EUR/MWh (exemptions) to 15,37 EUR/MWh. The lowest considered tariff for the non-exempted consumers is included in this range as it amounts to 1,537 EUR/MWh.

5. The “Konzessionsabgabe”, or Concession fee, is a tax imposed on all users to fund local governments. The basic rate for industrial consumers is 1,10 EUR/MWh241. Yet, consumers whose final electricity price (all taxes and grid fees included) remains below a fixed threshold (in 2018: 139,20 EUR/MWh, published in December 2019242), are exempted from the concession fee.

6. The “Abschaltbaren Lasten-Umlage”, or Interruptible loads levy, was a tax used to offset compensation payments made by transmission system operators to providers of so-called "switch-off" services. In 2023 no more AbLaV levy will be charged. The amount carried forward from the annual accounts for 2021 and 2022 will be used to reduce network charges at the transmission system operators in accordance with the provisions of the ARegV as agreed with the Übertragungsnetzbetreibern (Federal Network Agency).

Price cap for electricity in 2023

Next to these tax mechanisms, there is a potential price impact to consider from a new German support mechanism, the “*Strompreisbremse”*, which is an electricity price cap. As of 1st January 2023, this new energy policy includes price caps for electricity, gas and heat. It was installed to relief companies in Germany of the sharp increase in energy costs. The main goal of this electricity price mechanism is to lower the impact of the rising energy costs.

For profiles with a historical electricity consumption above 30 MWh per year (E-BSME, E0, E1, E2, E3 and E4), the electricity price will be capped at 13 cEUR/kWh (including taxes, levies and other charges) up to 70% of their electricity consumption of the previous year. For the remaining consumption, users will have to pay the regular market price.[243]

[239] (Bundesamt für Justiz, 2019)

[240] Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen für die Jahre 2015 bis 2018, pg. 98

[241] (Acteno, 2019)

[242] (RGC Manager, 2019)

[243] https://www.bundesregierung.de/breg-en/news/energy-price-brakes-2156430

France

Component 1 – the commodity price

In France, there is a specific mechanism called ARENH[244] that enables alternative electricity suppliers (i.e. suppliers different from EDF, the historical electricity supplier in France) to obtain part of the nuclear electricity production from EDF under specific conditions set by the French public authorities. The maximum aggregated amount made available under this special scheme was capped at 100 TWh/year in January 2023, with a price of 42 EUR/MWh[245]. That means that if the aggregated requests from suppliers under this scheme exceed the overall volume that can be provided (i.e. 100 TWh/year), then the volume of ARENH transferred by EDF is subject to a capping process set by the French Regulatory Commission of Energy (CRE).

It has to be noted that with the exception of the distribution of an additional volume of 20TWh in 2022 (see below), nor the mechanism itself nor the parameters used (ceiling, volumes, prices) have changed since January 1, 2012 for the ARENH. Similarly, the drop in nuclear production observed in France in 2022 and 2023 did not impact ARENH's distribution parameters for now.

2022: an exceptional year for the ARENH mechanism

In 2022, electricity prices have risen so much that the French public authorities decided to authorize an exceptional delivery of additional 20 TWh under the ARENH mechanism (on top of the usual 100 TWh) for the period ranging from 1st April to 31 December 2022 at a price to 46,20 EUR. This had an impact on both the capping mechanism in place ("écrêtement") and the price of electricity consumed under this scheme for that period of time and that is not reflected in this report's figures as it happened outside of the period in scope of this study.

The ARENH scheme is applicable to all profiles given that the two following conditions are met:

- the distribution of the ARENH among suppliers must be made according to the consumption profile of their customers;
- ARENH volumes must be representative of the historical share of nuclear production in comparison with the total electricity produced in France. The share of nuclear production is historically around 70%, but this proportion has dropped in recent years, reaching only 67,1% in 2020[246] mainly due to temporary closing of nuclear reactors. This proportion went however back to 69% in 2021[247] and decreased to 62,7% due to an increase of imported energy and increase of wind-based pho and solar energy[248].

The ARENH mechanism implies that the commodity price for a given profile is a combination of the market price and the regulated price, with a capping mechanism in place when the electricity quantity ordered exceeds a certain threshold. The capping rate vary from year to year based on the request of electricity made under the ARENH mechanism, and we can see an upward trend in volumes requested in recent years[249].

[244] ARENH stands for *Accès Régulé à l'Electricité Nucléaire Historique*, or *Regulated Access to Historic Nuclear Electricity*

[245] https://www.edf.fr/entreprises/electricite-gaz/le-benefice-arenh

[246] https://bilan-electrique-2020.rte-france.com/production-nucleaire/

[247] https://www.connaissancedesenergies.org/bilan-electrique-de-la-france-en-infographies-que-retenir-de-2021-220225

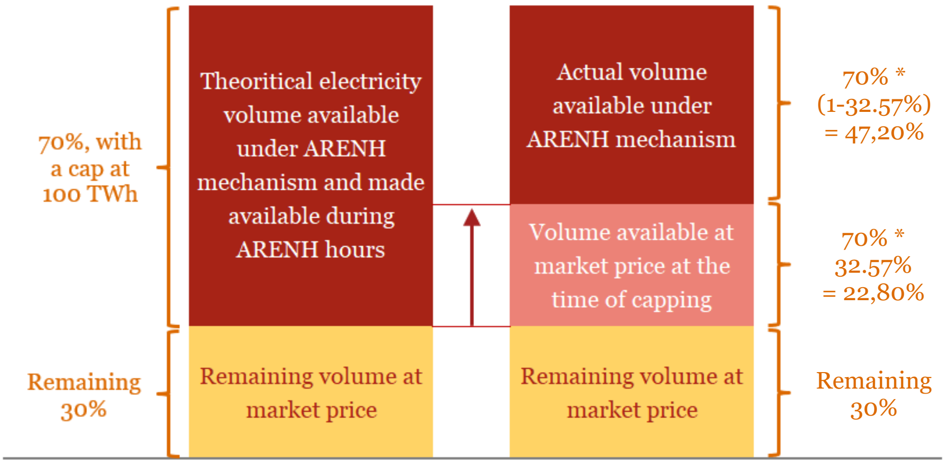
[248] https://www.connaissancedesenergies.org/bilan-electrique-de-la-france-en-infographies-que-retenir-de-2022-230216#:~:text=Malgr%C3%A9%20ces%20%C3%A9volutions%2C%20la%20production,source%20d'%C3%A9lectricit%C3%A9%20en%20France

[249] https://omnegy.com/ecretement-de-larenh-2022/#:~:text=Les%20demandes%20ARENH%20et%20l,%C3%A9cr%C3%AAtement%20de%2037%2C6%25

Année de livraison	Date de l'écrêtement	Demandes ARENH (TWh)	Taux d'écrêtement	Prix du marché (CAL+1 le jour de l'annonce)
2013	30/11/2012	40		
2014	29/11/2013	36		
2015	28/11/2014	33		
2016	30/11/2015	2		
2017	30/11/2016	30		
2018	01/12/2017	95		
2019	30/11/2018	133	25,0%	57,67
2020	29/11/2019	147	32,0%	49,14
2021	30/11/2020	146	31,6%	46,59
2022	01/12/2021	160	37,6%	169,25
2023	**01/12/2022**	**148**	**32,57%**	**445,16**

For 2023, the requests reached 148 TWh and the volumes of ARENH requested will therefore need to be reduced by 32.57% due to the capping[250]. The fact that alternative suppliers cannot obtain the entire volume of electricity requested under ARENH mechanism forces them to obtain the remaining volume from the wholesale electricity market, under less advantageous conditions due to the high price increase observed this year. This is explained in the figure below:

Figure 26: Capping for electricity volumes provided in 2023 during ARENH hours



[250]https://www.edf.fr/entreprises/electricite-gaz/le-benefice-arenh#:~:text=L'%C2%AB%20ARENH%20%C2%BB%20signifie%20%C2%AB,fix%C3%A9es%20par%20les%20pouvoirs%20publics

It is important to understand that the so called "ARENH price" is only applicable for the hours considered as "ARENH hours", which only represent a fraction of the total consumption of any given profile. An overview of the "ARENH hours" is displayed in the table below:

Table 91: Reference period for the ARENH

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Weekdays only	1 am < x < 7 am				■	■	■			■	■		
	All hours							■	■				
Weekends and bank holidays	All hours				■	■	■	■	■	■	■		

Consequently, all the volumes consumed by any given profile outside those hours cannot pretend to the ARENH reduced price. In order to obtain the most accurate data possible to compute the volume consumed under the ARENH scheme, it is first necessary to assess the total amount of hours eligible for this mechanism to be applied.

To obtain precise results, we include the average amount of bank holidays during the different period to obtain the number of hours under the ARENH scheme for 2023:

	Start date	End date	#days	Corr. Bank holidays	#hours
Weekday (april, may, june, sept, oct, from 1am to 7am)	01/04/2023	31/10/2023	108	103	618
Weekday (july, aug, all hours)	01/07/2023	31/08/2023	44	42	1.008
Weekend & bank holidays (april to oct, all hours)	01/04/2023	31/10/2023	62	69	1.656
			214	**214**	**3.282**

With those parameters, we come up to the following table:

Table 92: Percentage of ARENH hours compared to their overall consumption hours

Days included	Week days	Weekends and Public holidays	% of total consumption hours under ARENH (capping excl.)	% of total consumption hours under ARENH (capping incl.)
Profile E-BSME	✓	✕	13.21%	8.91%
Profile E0	✓	✕	33.03%	22.27%
Profile E1	✓	✕	41.29%	27.84%
Profile E2	✓	✕	41.29%	27.84%
Profile E3	✓	✓	87,81%	59.21%
Profile E4	✓	✓	91,32%	61.58%

If we take the example of a profile E4, that means that if 91.32% of the electricity consumption could theoretically be claimed at the ARENH price (42 EUR/MWh), only 61.58%[251] of the total consumption will ultimately be made available at this price due to the capping. In the context of a significant increase of market prices, the capping therefore induces a significant commodity price increase for each profile.

[251] 91.32% * (1-32.57%), 32.57% being the capping rate applicable for 2023

Taking the example of a profile E4, the commodity price (component 1) of the invoice for this profile can then be computed as following:

*91.32% * (1-32.57%) * ARENH price*

*+ 91.3% * (32.57%) * electricity market price at the time of capping*

*+ (1-91.3%) * electricity market price at contract signature*

For the supply part not covered by regulated prices (ARENH), it has been decided that all market prices will be based on the analysis performed by the CREG on all consumers contracts with a yearly consumption higher than 10 GWh. For E0, E1 and E2 profiles, CREG did not include weekend hours of EPEX SPOT, while for E3 and E4 profiles CREG included weekdays and weekend hours. This simplification underestimates the commodity price in France. This puts industrial profiles from other countries at a disadvantage, as the market price at the time of capping momentum could be higher than at contract signature (due to current price increases). Moreover, because of this simplification, we combine in our computations the electricity market price at the time of capping and the electricity market price at contract signature that should appear in the formula shown above. Still taking the example of a profile E4, the commodity price is then simplified in the following way:

*61.58% [252] * ARENH price + 38.42% * electricity market price provided by CREG for January 2023*

The same reasoning applies for all the different profiles in scope (E-BSME, E0, E1, E2, E3 and E4).

Component 2 – network costs

Integrated transmission and distribution costs

The RTE ("Réseau de Transport d'Electricité") is the Transmission System Operator (TSO) who oversees the transmission network. The French high voltage network starts at 1 kV, as shown in the table below and RTE operates the HTB (> 50 kV) networks.

Table 93: Voltage connection level and voltage domain in France

Voltage connection level (Un)	Voltage domain	
$U_n \leq 1$ kV	BT	Low Voltage domain
1 kV < $U_n \leq 40$ kV	HTA1 (E0, E1)	High Voltage domain
40 kV < $U_n \leq 50$ kV	HTA2	High Voltage domain
50 kV < $U_n \leq 130$ kV	HTB1 (E2)	High Voltage domain
130 kV < $U_n \leq 150$ kV	HTB2 (E3, E4)	High Voltage domain
350 kV < $U_n \leq 500$ kV	HTB3	High Voltage domain

[252] 91.32% * (1-32.57%), 32.57% being the capping rate applicable for 2023

The French transmission tariffs are composed of 3 components which are presented in this table:

Table 94: French transmission tariffs

<table>
<tr><td colspan="4">Network costs</td></tr>
<tr><th>Component</th><th>French label</th><th colspan="2">Explanation</th></tr>
<tr><td>Management component[253]</td><td>Composante annuelle de gestion</td><td colspan="2">The management component depends on whether a consumer has a unique contract or not. We assume profile E-BSME opted for individual contracts.</td></tr>
<tr><td rowspan="6">Component for taking off electricity</td><td rowspan="6">Composante annuelle de soutirage</td><td colspan="2">Multiple prices options exist varying depending on utilisation length and temporal differentiators with both capacity and consumption components. The prices options are:</td></tr>
<tr><td>HTA</td><td>HTB</td></tr>
<tr><td>1. Short use (CU) with a fixed peak</td><td>1. Short use (CU)</td></tr>
<tr><td>2. Short use (CU) with a mobile peak</td><td>2. Medium use (MU)</td></tr>
<tr><td>3. Long use (LU) with a fixed peak</td><td>3. Long use (LU)</td></tr>
<tr><td>4. Long use (LU) with a mobile peak</td><td></td></tr>
<tr><td>Metering tariff</td><td>Composante annuelle de comptage</td><td colspan="2">The metering tariff depends on whether the meter is owned by the consumer or not. The assumption is taken that concerned industrial profiles (E0 and E1) own their own meters.</td></tr>
</table>

For the consumers that fall under the HTA1 (E0 and E1), there is a similar offering, namely four contract options (see Table 94) based on the offtake in 5 different time slots. The number of hours per time slot was determined based on RTE's timeframe (see Table 95), considering that all these profiles do not operate during weekends. Again, all options were computed and are presented as a price range given that we cannot anticipate what option is preferred by our potential consumers.

Table 95: Hours per temporal classes in France

Hours per temporal classes – RTE Timeframe		
Temporal class	**Weekdays**	**Weekends**
Peak	4h/day for three months (December to February)	n/a
HPH	12h/day for three months (December to March) + 16h/day for two months (March and November)	n/a
HCH	8h/day for five months (November to March)	24h/day for five months (November to March)
HPB	16h/day for seven months (April to October)	n/a
HCB	8h/day for seven months (April to October)	24h/day for seven months (April to October)

The offtake tariffs are a bit more complicated than the other components for profiles falling under HTB (HTB1 for E2 and HTB2 for E3/E4) tariffs. There are additional fees that could have been considered, but we chose not to in this study. Firstly, there are fees for planned and unplanned exceeding of power capacity, a cost for the regrouping of connection, a complimentary fee and emergency power supplies, a fee for reactive energy and a transformation fee. Secondly, there are injection fees, which need to be paid for the injection in the grid. As we assume that the load capacity is constant throughout the year and do not exceed their contracted capacity, the latter components are not taken into consideration.

[253] Since 2018, the level of this component also considers the financial compensation paid to suppliers in connection with the management of single-contract customers.

Since February 2016, a new and relatively complex transmission tariff reduction was introduced to replace the more straightforward transmission tariff reductions that were in place between mid-2014 and late 2015. An update to this reduction was published in April 2021, redefining the eligibility criteria and transmission reduction rates associated. An increase in transmission tariffs finances those reductions billed to the network users who are not eligible for those reductions. Discounts are granted to baseload, "anti-cyclical", very large consumers and power storage sites connected to the grid according to the principles laid out in the table below.

Table 96: Transmission reductions eligibility criteria and rates

Profiles	Transmission reduction rate	Yearly duration of grid usage	Off-peak grid utilisation	Annual power consumption
Stable profile	81%	7.000h	-	>10 GWh
Anticyclical profile	74%	-	≥44%	>20 GWh
Large consumers	76%	-	≥40% and ≤44%	>500 GWh
Power storage sites connected to the grid	50%	-	≥40%	>10 GWh

Given this framework, we can make the following assumptions for the four consumer profiles under review:

- Profile E0 and E1 are **not eligible** for any reduction, as it does not meet the criteria for stable, anti-cyclical or large consumers.
- Profile E2 is **not eligible** for any reduction, as it does not meet the criteria for stable, anti-cyclical or large consumers - with an off-peak utilisation rate of 40% or 44%.
- Profile E3 **is eligible** for a reduction, as a stable consumer profile. With 7.692 consumption hours per year, the discount can go up to 81%.
- Profile E4 **is eligible** for a reduction, as a stable consumer profile. With 8.000 consumption hours per year, the discount can go up to 81%.

Component 3 – all other costs

As for residential and small professional consumers, there are two surcharges that must be considered for electricity in France:

Table 97: Other costs in France (E0, E1, E2, E3 and E4)

Title	Definition	Amount
Contribution Tarifaire d'Acheminement : **CTA**	The CTA finances part of the pensions of staff in the energy sector for Electricity and Natural gas Industries. It is only being applied to the subscription part of the tariff (HT)	There are two tariffs of the CTA depending on the grid to which the user is connected[254]: - 10,11% for consumers directly connected to the transmission grid (profiles E2, E3 and E4 in France) - 21,93% for all other professional consumers that are directly connected to the distribution grid (profile E0 and E1 in France). *Note: as network tariffs may vary according to the selected price option, the CTA amount may therefore also vary*
Accise sur l'électricité *(ex-CSPE including the TICFE and TCFE (composed of the TDCFE & TCCFE)*[255]	The TICFE is a tax that applies to all deliveries of electricity sent to an end user. Its amount is calculated according to consumption.	Since 1st February 2022 and until 31st January 2024, the TICFE rate is reduced from his 2016 historical value of 22,5 EUR/MWh to: - 0,5 EUR/MWh for Consumers >36 kVA and ≤250 kVA (E-BSME) - 0,5 €/MWh for Consumers >250 kVA (E-SSME) *This measure is part of the tariff shield ("bouclier tarifaire") applicable in France until at least 1st February 2024*
		Exemptions:[256] Professionals are exempt from the TICGN when the natural gas is used for the following purpose: - metallurgical processes, chemical reduction and electrolysis; - Companies for which electricity accounts for more than half of the cost of a product; - Manufacturing of non-metallic mineral products; - Production of energy products and electricity production; - Compensation for losses on the public electricity transmission and distribution network.

[254] https://selectra.info/energie/guides/comprendre/taxes/cta

[255] The « Taxe sur la Consommation Finale d'Électricité » (TCFE) was in 2022 including the « Taxe Départementale sur la Consommation Finale d'Électricité (TDCFE) » and the « Taxe Intérieure sur la Consommation Finale d'Électricité »TICFE. As from January 2023, it also includes the « Taxe Communale sur la Consommation d'Electricité » (TCCFE).

[256] https://www.edf.fr/entreprises/le-mag/le-mag-entreprises/decryptage-du-marche-de-l-energie/evolution-de-la-contribution-au-service-public-de-l-electricite-cspe-au-1er-fevrier-2023#:~:text=NB%20%3A%20Pour%20le%20mois%20de,au%201er%20janvier%202022.

The Netherlands

Component 1 – the commodity price

Commodity prices computation rests on market prices and describes the cost of electricity for industrial consumers as of January 2023. CREG used the ICE Endex CAL and the APX NL DAM as national indexes for the computation. The underneath commodity formula is used for each profile and is based on an analysis performed by the CREG of all Belgian consumers contracts with a yearly consumption higher than 10 GWh. For E-BSME to E24, CREG did not include weekend hours of APX NL DAM, while for E3 and E4 CREG included weekdays and weekend hours of APX NL DAM. The CREG provided the formulas and the computation of the commodity price. The equations are based on an analysis of all Belgian consumers with a yearly usage higher than 10 GWh, performed by the Belgian regulator of the electricity supply.

$$\textit{Commodity price}$$

$$= 36.5\%\, CAL\, Y_{-1} + 27.4\%\, CAL\, Y_{-2} + 21.4\%\, CAL\, Y_{-3} + 8.2\%\, Qi_{-1} + 4.2\%\, Mi_{-1} + 2.3\%\, APX\, NL\, DAM$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two year ahead forward price in 2021
CAL Y_{-3}	Average three year ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

Component 2 – network costs

Integrated transmission and distribution costs

In the Netherlands, the network costs integrate both transmission and distribution costs. As Dutch TSO, Tennet operates the transmission grid and is responsible for the infrastructure above 110 kV. Hence, profiles E3 and E4 are assumed to be directly connected to the transmission grid, respectively to the high voltage (110-150 kV) and the extra high voltage grid (220-380 kV). Consequently, they are subject to Tennet's prices. Concerning the other industrial profiles (E0, E1 and E2) and E-BSME, connected to lower voltages and thus to the distribution grid, they are subject to DSOs 'prices. Similar to the residential profiles in the Netherlands, we use a weighted average of the seven distribution zones because the Netherlands uses an integrated tariff[257].

For all profiles above-mentioned, they involve the same four main components[258]:

Table 98: Network cost component in the Netherlands

Network costs		
Component	**Dutch labelling**	**Explanation**
Standing charge	Vastrecht	Fixed basic fee (expressed in EUR/year).
Capacity charge	Capaciteitstarieven	Fees are covering the costs associated with the transmission of electricity. They are subdivided into three terms: – Fixed charge depending on the contracted capacity (expressed in EUR/year); – Variable charge depending on the monthly peak (expressed in EUR/kW/month); – Variable charge depending on the consumption level (expressed in EUR/kWh).
Periodical connection tariff	Periodieke aansluitvergoeding	Fixed fee is covering the costs for managing the connection (expressed in EUR/year).
Metering charge	Meettarief	Fixed charges are covering for the use and management of energy meters (expressed in EUR/year).

However, a reduction ("*Volumecorrectie*") in transmission prices must be taken into consideration. This correction targets energy-intensive consumers who jointly fulfil the following two conditions[259]:

1. The customer exceeds 50 GWh/year in terms of offtake.
2. The operating time exceeds 5.700 hours per year (or 65%) during off-peak hours[260].

The possible reduction is calculated according to the following formula, with a 90% reduction limit:

$$Volume\ correction\ (in\ \%) = \frac{(Company\ operating\ time - 65\%)}{(85\% - 65\%)} * \frac{(offtake - 50\ GWh)}{(250\ GWh - 50\ GWh)} * 100$$

Where

$$Company\ operating\ time\ (in\ \%) = \frac{(Total\ offtake\ during\ offpeak\ hours\ /\ maximum\ capacity)}{(hours\ per\ annum)} * 100$$

[257] All industrial profiles are not served by all DSOs. COTEQ and RENDO do not serve consumers similar to our E1 and E2 profiles (from HS voltage level) while Westland does not provide profiles similar to E2 (from TS)
[258] (TenneT, 2020)
[259] (Overheid, 2014)
[260] In the Netherlands, off-peak hours are between 11pm-7am in addition to weekends and bank holidays.

Component 3 – all other costs

Unlike previous years, and as it is the case for residential and small professional consumers, only one surcharge remains in the Netherlands, namely the Energy Tax ("Regulerende Energie Belasting", or REB). In the 2023 Tax Plan, the Dutch government has indeed proposed to simplify the energy tax system by including the rates for the surcharge for sustainable energy and climate transition ("Opslag Duurzame Energie", or ODE) directly in the energy tax. As a result, all ODE rates for the year 2023 are reduced to 0,00 EUR. (As from 2024, the ODE will be formally abolished)[261] The Energy Tax (REB) varies, in a degressive trend, according to the amount of consumed electricity as shown in the table below:

Table 99: Electricity Energy Tax and ODE bands (Netherlands, 2023)[262]

Band	Consumption (in kWh)	Energy Tax (EUR/kWh – VAT excl.)	ODE levy (EUR/kWh – VAT excl.)
1	Up to 10.000	0,12599	0,00000
2	10.001 - 50.000	0,10046	0,00000
3	50.001 - 10.000.000	0,03942	0,00000
4	> 10.000.000 (professional)	0,00115	0,00000
4bis	> 10.000.000 (non-professional)	0,00175	0,00000

Given the consumption level of our profiles under study, they fall into the following bands: band 3 for E0 and E1, and band 4 for E2, E3 and E4 profiles.

1. Industrial consumers are exempted if they use electricity for chemical reduction or electrolytic and metallurgical processes.
2. Tax discounts are also possible for cooperatives. However, the profiles under study are assumed not to fall under this category.
3. Finally, a tax refund scheme ("teruggaafregeling") is applicable to public and religious institutions such as clinics, schools, sports centres, churches, etc. We assume that our profiles are not part of these specific categories and thus do not take this specific scheme into account.

Several of the criteria that give access to these tax refunds are based upon economic and accounting data, which are not defined for the industrial profiles of this study. Therefore, we present a range of results with an outlier option (maximum rate only applies if the industrial consumer is not energy-intensive and cannot qualify for the full exemption) and a range spanning from the minimal option (totally exempted) to the refund rate (0,50 EUR/MWh).

Note:

A Tax refund scheme ("teruggaafregeling") was previously applicable for industrial consumers classified as energy-intensive and having concluded a multiple-year agreement with the Dutch government to save energy by improving their energy efficiency. These consumers could, up to the 31st of December 2022, apply for a refund of any tax paid above their consumption of 10.000 MWh after each financial year. However, as show, in the table above, this has been discontinued this year. Hence, where the E2 to E4 consumer profiles which were falling into band 4 were still considered for this refund in the last year's report, it is not true anymore.[263]

[261] https://www.vattenfall.nl/grootzakelijk/energiebelasting/tarieven/

[262] ibid

[263] https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen_tarieven_milieubelastingen

The UK

Component 1 – the commodity price

Commodity prices computation rests on market prices and describes the cost of electricity for industrial consumers as of February 2023. We used the APX UK DAM as the national index for the calculation. The underneath commodity formula is used for each profile and is based on an analysis performed by the CREG of all Belgian consumers contracts with a yearly consumption higher than 10 GWh.

The commodity formula applies to each profile. For profiles E0, E1 and E2, we use all hours apart from weekends of APX UK DAM, while for profile E3 and E4, we utilise all hours of APX UK DAM.

Commodity price

$$= 36.5\%\,CAL\,Y_{-1} + 27.4\%\,CAL\,Y_{-2} + 21.4\%\,CAL\,Y_{-3} + 8.2\%\,Qi_{-1} + 4.2\%\,Mi_{-1} + 2.3\%\,APX\,UK\,DAM$$

Where:

	Explanation
CAL Y_{-1}	Average year ahead forward price in 2022
CAL Y_{-2}	Average two year ahead forward price in 2021
CAL Y_{-3}	Average three year ahead forward price in 2020
Qi_{-1}	Average quarter ahead forward price in the fourth quarter of 2022
Mi_{-1}	Average month ahead forward price in December 2022

We computed the commodity price based on the formula mentioned above, in British Pounds, and then converted the amount to Euros using the January 2023 average monthly rate[264] (also see section "General assumptions")

Component 2 – network costs

Transmission cost

As we have described above, the UK's network structure is divided between three TSOs, six DSOs and fourteen identified tariff zones. On a technical level, the grid is organised as follows:

Table 100: Tariff scheme regarding transmission cost in the UK

Transmission costs		
Connection voltage (U_n)	**Operator**	**Tariff scheme**
U_n < 22 kV	**DSO**	Common Distribution charging methodology (CDCM) + Transmission charges (TNUoS)
22 kV =< U_n =< 132 kV		Extra high voltage distribution charging methodology (EDCM) + TNUoS
275 kV =< U_n =< 400 kV	**TSO**	Transmission charges (TNUoS)

[264] Conversion factor of 1,1336 EUR/GBP, the average conversion factor over the month of January, according to the European Central Bank is considered.

The voltage of the transmission grid is particularly high, which is why we assume that E-BSME, E0, E1 and E2 are still connected to the distribution grid, but the bigger industrial profiles (E3 and E4) are directly connected to the transmission grid. In the UK transmission charges are known as the Transmission Network Use of System (TNUoS) charges and have two different rates: Half-Hourly (HH) and Non-Half-Hourly (NHH). As only the former applies to our industrial profiles, we only detail this one below:

Table 101: Half-hourly (HH) tariff option in the UK

Transmission costs		
Tariff option	**Explanation**	**Profile**
Half-Hourly (HH)	Metering system, which utilises AMR (automatic meter reading) technology to provide electricity consumption reading. The system sends updated meter reads to the energy supplier every half hour. Customers pay a capacity tariff depending on their connection capacity, expressed in p/kVA/day.	E0 to E4

Since the HH tariffs differ between all fourteen zones of the UK, a weighted average of the transmission costs is presented for all our industrial profiles.

There are also rates applied to cover for network losses, and the UK uses a system similar to the Belgian one (but more dynamic) to apply these costs. The Balancing and Settlement Code Administrator, each half-hour, defines the Transmission losses multiplier (TLM) applicable for offtake and delivery. This cost is added to the bill as a percentage of the commodity cost for offtake and should thus not be part of this component. Yet, even though it is not part of the tariff structure as such, we include it as a network component.

Distribution costs

Distribution costs, which are due for profiles E0, E1 and E2, have a more complex methodology.

Profiles E0 and E1 pay according to the Common Distribution Charging Methodology (CDCM). They are billed for total offtake across all demand time periods and with important differences between peak and off-peak offtake. This methodology encompasses the following components:

Table 102: Distribution costs (CDCM) in the UK

Distribution costs	
Component	**Explanation**
Total consumption	A unit charge in p/kWh
Fixed charge	Fixed charge per offtake point in p/MPAN[265]/day
Metering costs[266]	Cost for use and management of your energy meter in p/day or GBP/year

[265] Meter Point Administration Number

[266] Electricity metering charges in the UK are not easily accessible. A proxy was used to account for these charges based on a methodology disclosed by National Grid, British TSO delivering electricity and natural gas. As electricity and natural gas are frequently offered as one product with a dual tariff, natural gas metering methodology was used as a proxy. Charges are billed as a fixed yearly charge for installation costs recovered via a rental given that we assume our profiles do not own the meters.

As for profile E2, it is charged through the EHV Distribution Charging Methodology (EDCM), which are largely based on capacity with a small element for offtake in the high demand time-period in addition to a fixed charge. The EDCM provides for individual tariffs for each customer depending upon location, demand, generation (type) and capacity. The individual EDCM-rates are made public, which is why we calculated the average individualized EDCM-rates compared to CDCM-tariffs in each of the fourteen zones.

We present the average EDCM-rates on CDCM-tariffs in the fourteen zones as the distribution cost value for profile E2. The following components compose EDCM charges:

Table 103: Distribution costs (EDCM) in the UK

UK	
Component	**Explanation**
Total consumption	A unit charge for high demand periods, expressed in p/kWh.
Fixed charge	Fixed charge per offtake point in p/day
Capacity charge	Daily Fixed charge function of the contracted capacity, expressed in p/kVA/day
Metering costs[267]	Cost for use and management of your energy meter in p/day or GBP/year

Component 3 – all other costs

Three additional costs are applicable on electricity in the UK:

(1) The **Climate Change Levy** (CCL) is applicable to the consumption of natural gas for businesses in the industrial, public services, commercial and agricultural sectors.This study considers that industrial consumers analysed, are all embodied in the Climate Change Agreement. This levy is “an environmental tax charged on the energy that businesses use. It’s designed to encourage businesses to be more energy efficient in how they operate, as well as helping to reduce their overall emissions.”[268]

The following table gives an overview of the rates that are charged to professional consumers regardless of their profile (Residential consumers are exempted from it[269]):

Table 104: Climate Change Levy rates on electricity[270]

Time period	Electricity rate (GBP)
1st April 2022 to 31st March 2023	0.775p/kWh
1st April 2023 to 31st March 2024	0.775p/kWh
1st April 2024 to 31st March 2025	0.775p/kWh

There is a possible reduction of 93% if the energy-intensive consumer has a Climate Change Agreement (CCA). We assume that all industrial profiles (E0 to E4) under this study concluded a CCA.

[267] Electricity metering charges in the UK are not easily accessible. A proxy was used to account for these charges based on a methodology disclosed by National Grid, British TSO delivering electricity and natural gas. As electricity and natural gas are frequently offered as one product with a dual tariff, natural gas metering methodology was used as a proxy. Charges are billed as a fixed yearly charge for installation costs recovered via a rental given that we assume our profiles do not own the meters.

[268] https://www.sefe-energy.co.uk/help-and-support/bills-payments/what-is-the-climate-change-levy-ccl/

[269] (GOV.UK, 2023)

[270] ibid

Given that 7.814 facilities were covered by a CCA in 2017[271] for about 7.700 large businesses (>250 employees)[272], we consider that all industrial profiles from this study are part of a sectoral agreement. Besides, a large spectrum of industrial processes[273] is accepted to be eligible to apply for a CCA, which widens the number of companies that can be considered.

On top of that, there are multiple exemptions regarding the CCL, among others when electricity is a supply[274]:

- for domestic use or used by a charity for its non-business activities;
- used in some forms of transmission;
- to combined heat and power stations;
- for small generating stations (other than combined heat and power) used to generate any electricity that's not self-supplied;
- not used as fuel.

(2) The **Renewables Obligation (RO)** is the cost placed on electricity suppliers in the UK for the large-scale renewable subsidy scheme. Like the Climate Change Levy, the quota and buyout price are determined for a year starting in April. From 1st April 2022 to 31st March 2023, the buyout price per RO Certificate is 59,01 GBP (66,63 EUR).

(3) The **Assistance for Areas with High electricity distribution Costs (AAHEDC)** levy compensates for high distribution costs in the zone of Northern Scotland (1 of the 14 zones), amounting 0,040670 p/kWh for the period ranging from 1st April 2022 to 31st March 2023.[275]

An additional cost identified in the UK is the one that relates to the capacity market. However, it was decided not to take this cost into consideration for this study. First, because it is paid by the suppliers, who integrate it in their offerings and do not disclose the exact amount of the costs. Secondly, because the UK is an outlier in most electricity profiles under review (E1 to E4). The prices in this study can therefore be seen as a slight underestimation of the real electricity cost in the UK, but it does not impact any of the conclusions.

[271] (Ecofys and adelphi, 2018)

[272] (Department for Business, Energy & Industrial Strategy, 2020)

[273] Defined in the Appendix A of the Climate Change Agreements Operations Manual.

[274] (GOV.UK, 2020)

[275] https://www.nationalgrideso.com/industry-information/charging/assistance-areas-high-electricity-distribution-costs-aahedc

Natural gas

Natural gas: Detailed description of the prices, price components and assumptions

For all countries under review, this section details:

1. **Commodity costs** for profiles G0, G1 and G2
2. **Network costs** for profiles G0, G1 and G2
3. **All other costs** for profiles G0, G1 and G2

Profile	Consumption (in MWh)
G0	1.250
G1	100.000
G2	2.500.000

Belgium

Component 1 – the commodity price

Commodity prices, in this document, rest on market prices and reflect the cost of natural gas for industrial consumers as of January 2023 as provided by the CREG. The given prices for profiles G0 to G2, are the result of prices observed in January 2023 at the Zeebrugge Trading Point (ZTP). However, it is known that the majority of Belgian industrial consumers' contracts are indexed on TTF[276], which represents their largest component of natural gas bills.

Component 2 – network costs

Transport costs

According to the consumer profiles, G0 and G1 are connected to the distribution grid. We assume that they are respectively connected at T4 and T6 levels. Concerning G2, as most industrial consumers in Belgium are connected at high-pressure level, we assume that this is also the case for our G2 profile.

Natural gas transport costs have 3 main components for clients directly connected to the transport grid:[277]

(1) Entry capacity fee (border point entry fee);
(2) Exit capacity fee (HP-service fee or RPS[278])[279];
(3) Commodity fee ("energy in cash").

The optional odorization tariff is not considered in the scope of this study. The reasoning is that most industrial consumers in Belgium on the TSO-grid do not need odorization services from Fluxys.

Part of the network in Belgium is supplied with "L-gas". This natural gas has a lower calorific value than the "H-gas" that is used in most of Western Europe. The following table illustrates the repartition of industrial consumers supplied with H- or L-gas depending on their connection to the Distribution (DG) or Transport grid (TG). The main evolution compared to last year is observed in Brussels, where the ratio H-gas vs L-gashas reversed.

Table 105: Natural gas type by grid type for each Belgian region (in%)

	Brussels		Flanders		Wallonia	
Natural gas Type	DG	TG	DG	TG	DG	TG
H-gas	75,08%	-	61,90%	94,98%	88,17%	98,91%
L-gas	24,92%	-	38,10%	5,02%	11,83%	1,09%

Source: CREG (2023)

The transport tariffs for natural gas in Belgium are largely capacity-based and expressed in EUR/kWh/year. Transport costs vary depending on the type of natural gas consumed, which is why a weighted average of H- and L-tariffs for the G2 profile are computed.

[276] https://www.creg.be/fr/publications/etude-f2410 (CREG, 2022)

[277] Since 2020, the "fix/flex" tariff option does no longer exist and therefore cannot be chosen by directly connected consumers (CREG, 2020).

[278] RPS stands for Reduced Pressure Service which, since 2020, encompasses both former Medium Pressure (MP) and Pressure-reducing stations (DPRS) services.

[279] For exit capacity fee at end-user domestic exit points, HP (High Pressure) tariff option or RPS can be chosen. As 99% of Belgian industrial consumers need to pay HP capacity fees, while the MP capacity fee is due for 31% of the Belgian industrial consumers, the exit capacity was therefore calculated as follows: 0,99* HP-tariff + 0,31*RPS-tariff.

Finally, the commodity fee depends on the annual consumption of the end-user (in MWh/year). It accounts for 0,08% of a theoretical commodity cost per year, based on the Gas Price Reference[280], which is the ZTP average of day-ahead commodity prices, as published by Powernext.

Distribution costs

As previously stated, profile G0 and G1 are connected to the distribution grid. Users of the distribution grid are also subject to additional tariffs. The T4 category was selected for our G0 profile and T6 for G1. Since the highest category on the Brussels' distribution grid is T5, this one was selected for the G1 profile.[281] The distribution tariffs are typically divided over 3 components:

(1) Fixed component;
(2) Proportional component;
(3) Capacity component (only Flanders and Wallonia).

Besides, other components are part of the distribution costs, although they vary depending on the region. As such Brussels includes a tariff for the measuring activities and Flanders a tariff of data management, whereas Wallonia adds a tariff for regulatory balances.

The weighted average of each component across all DSOs active in the region is considered since the tariffs differ across regions and DSOs. The weights are based on the number of EAN connections of each DSO. For Flanders, all DSOs under FLUVIUS were considered (100% of EAN connections) and in Wallonia all the DSOs under ORES and RESA (100% of EAN connections). With only one DSO, Sibelga is the DSO used for Brussels.

Component 3 – all other costs

In Belgium, two extra costs are charged to natural gas consumers directly connected to the transport grid; three regional taxes also apply to all profiles studied whereas local taxes and levies can be charged to profiles G0 and G1 given their connection to the distribution grid. These costs can be grouped into two categories, as presented below, where federal charges are levied by the suppliers and regional charges are levied by regional DSOs (and invoiced to the suppliers which invoice final customers): Tariff rates are mentioned when they do not vary depending on the consumer profile and/or the DSO; otherwise, units in which they are expressed are detailed.

Table 106: Other costs for industrial natural gas consumers applying to all Belgian regions

All regions	Profiles
Regional Public Service Obligations (Regional PSOs) on distribution	
a. A general tariff for regional PSOs (expressed in EUR/MWh) – except for Flanders	G0 and G1 (Brussels and Wallonia)
Taxes and levies on the federal level	
II. Federal taxes and levies	
a. Energy contribution[282] (0,54 EUR/MWh). b. Special excise duty	a. All b. All

[280] For more information on the Gas Price Reference, please see (Fluxys, 2020)
[281] T5 (and not T6) is the highest category for Sibelga network active in Brussels which we use in the scope of this study.
[282] The tariff is reduced to 0,54 €MWh for holders of an EBO or sector agreement. We assume that the reduction applies starting G0.

The table below shows the tax rates applied as of 2023 at the Federal level in Belgium for all commercial profiles.

It has to be noted that the special excise duty has been temporarily decreased and is applicable from 1st November 2022 until the 31th March 2023 (Loi-Programme 26/12/2022) for professional use on consumption up to 50.000 MWh.[283]

Table 107: Special excise duty rates in Belgium for Gas commercial consumers

Yearly consumption	Tax for G0, G1 and G2(EUR/MWh)
Consumption up to 20.000 MWh	0,00
Consumption between 20.000- 50.000 MWh	0,00
Consumption between 50.000- 250.000 MWh	0,54
Consumption between 250.000 – 1.000.000 MWh	0,42
Consumption between 1.000.000- 2.500.000 MWh	0,22
Consumption above 2.500.000 MWh	0,15

According to Art. 429.§ 1er of the law from 27th December 2004[284] an exemption is foreseen when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures. For the sake of this report, we assumed that profiles G1 and G2 could potentially benefit from this exemption, if they fall within the conditions specified by the law.

[283] https://www.ey.com/en_be/tax/tax-alerts/2022/monthly-customs-and-excise-update-december-2022
[284] https://www.ejustice.just.fgov.be/eli/loi/2004/12/27/2004021170/justel

Table 108: Other regional costs for industrial natural gas consumers[285]

Brussels	Flanders	Wallonia	Profiles
Regional Public Service Obligations (Regional PSOs) on transport			
a. Brussels regional public service obligation[286] (expressed in EUR/MWh)	-	-	G0 and G1
Taxes and levies on the regional level			
Regional taxes and levies on distribution			
a. Charges on non-capitalised pensions (0,00- 0,041 EUR/MWh)	a. Charges on non-capitalised pensions (0,0056 - 0,0436 EUR/MWh)	a. Levy for occupying road network (0,067 - 0,492 EUR/MWh)	G0 and G1
b. Levy for occupying road network (1,429 EUR/MWh)	b. Other local, provincial, regional, and federal taxes, Charges, Surcharges, Fees, and contributions (0,0011 - 0,0085 EUR/MWh)	b. Corporate income tax (0,0359 - 0,2677 EUR/MWh)	
c. Corporate income tax and other taxes (0,021 - 0,207 EUR/MWh)	-	c. Other local, provincial, regional, and federal taxes, Charges, Surcharges, Fees, and contributions (0,0002 - 0,0022 EUR/MWh)	
Regional taxes and levies on transport			
-	-	Connection fee 0,075 EUR/kWh for the first 1 MWh; then a. if yearly consumption < 1 GWh: 0,000075 EUR/kWh b. if yearly consumption < 10 GWh: 0,00006 EUR/kWh c. if yearly consumption >= 10 GWh: 0,00003 EUR/kWh	All

[285] The tariffs represented in this table vary depending on the DSO and we have thus chosen to only present the minimum and maximum range of the tariff from the largest (or only) DSO of the region. Sibelga for Brussels, Fluvius Antwerpen for Flanders and ORES Hainaut for Wallonia.

[286] Depends on the calibre of the meter being installed. For G-Pro, G0 and G1 we respectively chose the meters process between 16-25 m^3, 40-65 m^3 and > 160 m^3. Which respectively coincides with 57,48€, 287,64€ and 742,32€, on which VAT is due.

Germany

Component 1 – the commodity price

In this study, natural gas commodity prices are estimated based on market prices. As previously mentioned, we consider one market area in Germany, the Trading Hub Europe (THE), which is the result of the merger between Gaspool and Netconnect Germany (NCG).

For all industrial profiles (G0 to G2), as well as G-PRO, the commodity price exhibited in this document is the average of prices collected in each market areas in January 2023. The CREG provided all commodity prices for Germany.

Component 2 – network costs

Transport costs

There are 11 TSOs for natural gas in Germany, which all have directly connected clients. While their tariff methodology might be similar, they use different rates. As we consider that profile G2 is directly connected to the transport grid, entry and exit capacity tariffs for all TSOs have been considered in addition to the costs related to metering and invoicing. The transport tariffs comprise in general, the same three components:

Table 109: Components of German transport costs

Transport costs	
Component	**Explanation**
Entry point capacity rate (Einspeisung)	Depends on the contracted entry point and the capacity contracted (in kW)
Exit point capacity rate (Ausspeisung)	Depends on the exit point chosen and the capacity contracted (in kW)
Metering costs (Messung)	Both charges related to the cost of metering, fixed prices (in EUR/year)
Metering point operation per counting point charges (Messstellenbetrieb)	

Distribution costs

Since two of our profiles (G0 and G1) are connected to the distribution grid, they are subject to distribution costs. Since these differ between DSOs, prices from 8 different DSOs (4 rural, 4 urban) are considered. However, the tariffs from the DSOs also integrate the transport tariffs. While we assume profile G0 falls under the category “Netzentgelte für Entnahmestellen ohne Leistungsmessung” (or Network charges for offtake points without power metering) as their consumption is yearly metered, G1 is considered as being in the category “Netzentgelte für Entnahmestellen mit Leistungsmessung” due to its daily metered consumption (or Network charges for offtake points with power metering). These distribution tariffs are generally composed of 5 components:

Table 110: Components of German distribution costs

Distribution costs	
Component	**Explanation**
Basic charge (Sockelbetrag Arbeit/Leistung)	Fixed basic fee, expressed in EUR/year.
Capacity charge (Leistungspreis)	Depends upon the maximum capacity in kW contracted, expressed in EUR/year.
Labour charge (Arbeitspreis)	Depends upon the volume of energy consumed in kWh per year, expressed in cEUR/kWh/year.
Metering costs (Messung)	Charges related to the cost of metering and invoicing, fixed prices (in EUR/year)
Metering point operation per counting point charges (Messstellenbetrieb)	

German annual charge for natural gas is computed as follows:

$$Annual\ charge = [Arbeitspreis * (Annual\ Consumption - \ Durch\ Sockelbetrag\ abgegoltene\ Arbeit) + Sockelbetrag\ Arbeit] + [Leistungspreis * \ (Annual\ Consumption - \ Durch\ Sockelbetrag\ abgegoltene\ Leistung) + Sockelbetrag\ Leistung]$$

Where, *Durch Sockelbetrag abgegoltene Arbeit/Leistung* is the price band bottom levels, expressed in kWh or in kW respectively.

Depending on the consumers' consumption volumes and capacity, they fall under certain categories (the number of categories depends on the local DSO). These categories determine the amount of consumption volume and capacity that must be set at a standard rate, while the rest fall under the network cost fares as determined by local DSOs. These volumes and capacity are said to be compensated to limit network costs and ultimately, DSOs' remuneration.

Component 3 – all other costs

Four further costs were found for industrial consumers in Germany: the "*Biogaskostenwälzung*" or Biogas levy, the "*Marktraumumstellungsumlage*" or Market Area Conversion Levy, the "*Erdgassteuer*", or Gas tax, the "*Konzessionsabgabe*", or concession fee, and the "CO2 Steuer, or carbon tax, which are detailed in the table below.

Table 111: Other costs for large industrial natural gas consumers

All other costs			
Component	**German label**	**Explanation**	**Profiles**
Biogas levy	Biogaskosten wälzung	A Nationwide standard levy implemented in January 2014. This levy amounts to 0,6983 EUR/kWh/year in 2023.	All
Market Area Conversion Levy	Marktraumum stellungs-Umlage	A burden to balance the conversion costs from L-gas to H-gas, implemented in January 2015. The 2023 levy amounts to 0,7547 EUR/kWh/y.	All
Energy tax	Energiesteuer	This tax has various rates depending on the energy source (e.g. coal, biodiesel, natural gas, bioethanol…), valid since January 1989. For natural gas for industrial consumers, **the standard tax rate is 5,50 EUR/MWh**. A reduction of 1,38 EUR/MWh can apply, bringing the price down to **4,12 EUR/MWh** (= 5,50 EUR/MWh -1,38 EUR/MWh)[287] As mentioned for the electricity in Germany, based on the amount of pension contributions paid by the company, more reductions can be granted. Initially implemented to fund employees' pensions, companies may be granted important reductions whether they do not contribute much because of a low number of employees. Another cut of 2,28 EUR/MWh can be used for natural gas, lowering the rate to 1,84 EUR/MWh (= 4,12 EUR/MWh - 2,28 EUR/MWh); however, it is an 'incompressible' rate. **The minimum tariff** is computed as follows: A 90% reduction on 2,28 EUR/MWh represents the maximum cut ((100%-90%) * 2,28 EUR/MWh = 0,228 EUR/MWh) to which we add the previous lowest rate (1,84 EUR/MWh) reaching **2,068 EUR/MWh** (=0,228 EUR/MWh + 1,84 EUR/MWh)[288][289]. These reductions apply depending on the sectorial affiliation of companies.	All

[287] This tax rate hasn't changed in the past years.

[288] Energiesteuergesetz § 54, Energiesteuergesetz § 55

[289] In very specific cases, further reductions are possible. We have not included these in our report.

		No energy tax applies when the natural gas purpose is not fuel or heating, but as raw material, feedstock part of an industrial process[290]. As the pension payment reduction system is based on economic criteria that are not precise for profile G0 and G1, we exhibit a range from 2,068 EUR/MWh (minimum rate) to 4,12 EUR/MWh (standard reduction). As we assume that G2 might consume electricity as feedstock in its industrial processes, we display a scope from 0 EUR/MWh (exemption – only the biogas levy must be paid) to 4,12 EUR/MWh (standard reduction)	
Concession fee	Konzessions-abgabe	A tax that also exists for electricity consumption. However, clients with a high-level use (higher than 5 GWh/year) benefit from a total exemption, meaning this tax is not relevant as we study profiles with greater use (i.e., not relevant for G1 and G2) except for G0.[291]	G-PRO and G0
Carbon Tax	CO2 Steuer	An energy tax that is applied to the gas used for heating and transport and it is applicable to all consumers profiles under review. The rate amounts to 0,5461 ct/kWh of gas consumed.	All

Price cap for natural gas in 2023

As of 1st January 2023, a price cap applies for natural gas as a temporary measure to protect industrial customers from an uncontrolled natural gas price increase. For consumers with a historical gas consumption above 1.500 MWh per year (G1 and G2), the natural gas price will be capped at 0,07 EUR/kWH kWH (excluding taxes, levies and other charges) up to 70% of their natural gas consumption of the previous year. For the remaining consumption, users will have to pay the regular market price.[292]

[290] Energiesteuergesetz § 27
[291] This tax rate hasn't changed in the past years.
[292] Source: https://www.bundesregierung.de/breg-en/news/energy-price-brakes-2156430

France

Component 1 – the commodity price

France used to work with two market areas (PEG Nord and TRS) regarding natural gas. In 2018, the merger of these areas resulted in the creation of a single zone, TRF (PEG), which we present accordingly as a unique price zone[293]. The commodity prices exhibited in this document are the prices collected in January 2023 as provided by the CREG.

Unlike electricity supply for industrial consumers with a yearly consumption higher than 300 MWh (ARENH), France does not provide a regulated tariff for natural gas supply[294].

Component 2 – network costs

Transport costs

As previously stated, there are two Transmission System Operators (TSOs) in charge of the natural gas transport network: GRTgaz and Teréga. Transport costs are computed based on a weighted average of TSOs' annual natural gas offtakes, as set out below:

Table 112: TSOs natural gas offtake in France

TSO	Annual consumption (2019) in GWh	Percentage of annual consumption (%)
GRTgaz	451.728	94,20%
Terega	27.758	5,80%

Transport tariffs are built along with the same methodology, and made of three main components for end-users on the transport grid:

Table 113: Transport cost component in France

Transport cost		
Component	**French labelling**	**Explanation**
Fixed charge	Terme fixe de livraison	Applicable per year per delivery station (expressed in EUR/year)
Entry capacity fee	Terme de capacité d'entrée sur le réseau principal	Applicable to daily delivery capacity subscriptions (expressed in EUR/year/MWh/day)
Delivery charge	Terme de capacité de livraison	Applicable to daily delivery capacity subscriptions for industrial consumers (expressed in EUR/year/MWh/day)

[293] On 1 April 2015, a common market area in Southern France, "Trading Region South" (TRS), replaced the former PEG TIGF and PEG SUD. On 1 November 2018, TRS and PEG-Nord merged into a single market area (TRF) with a unique trading hub (PEG or Point d'échange de gaz).

[294] France used to provide regulated selling rates regarding natural gas based on categories for professionals (B2S, TEL S2S/STS) with a higher yearly consumption than 300 MWh. However, this disappeared in December 2015 for industrial consumers.

Distribution costs

Profiles G-Pro, G0, and G1 are located on the distribution grid, respectively subject to T3 and T4 tariff option (determined by their annual consumption level). Given that distribution costs integrate transport costs, only these tariffs apply to our G0 and G1 profiles. Only tariffs from GRDF (Gaz Réseau Distribution France) are considered as it delivers 96% of all distributed natural gas in France. The tariff has three components:

Table 114: Distribution cost components in France

Distribution costs		
Component	**French labelling**	**Explanation**
Fixed charge	Abonnement	Applicable per year per subscription (expressed in EUR/year)
Proportional component	Prix proportionnel	Variable component based on consumption (expressed in EUR/MWh)
Delivery charge	Terme de souscription capacitaire journalière	Applicable to daily delivery capacity subscriptions for industrial consumers with annual consumption from 5.000 MWh (expressed in EUR/MWh/day)

Component 3 – all other costs

In France, two surcharges apply on natural gas:

Table 115: Surcharges on natural gas in France

All other costs			
Name	**Definition**	**Amount in 2023**	**Profile**
Contribution Tarifaire d'Acheminement : **CTA**	The CTA finances part of the pensions of staff in the energy sector for Electricity and Natural gas Industries.	20,80% on the fixed part of distribution cost	Profiles G0 and G1
		4,70% on the fixed part of the transport cost	Profile G2 (Not on G0 and G1 as distribution tariffs include transport costs)
Taxe Intérieure de Consommation sur le Gaz Naturel : **TICGN**	The TICGN is a tax that applies to all deliveries of natural gas sent to an end user. Its amount is calculated according to consumption.	8,37 EUR/MWh. This rate has been falling since 2020, and it decreases here by €0,04 compared to 2022.[295]	G0, G1, G2
		<u>Exemptions:</u>[296] Professionals are exempt from the TICGN when the natural gas is: • intended for use other than as fuel; • intended for dual use, i.e. when used both as fuel and for other purposes; • used as part of a process for manufacturing non-metallic mineral products; • used to generate electricity (gas power plants); • used to enable its extraction and production; • used within premises dedicated to the production of energy products, for the manufacturing of those energy products or the production of the energy necessary for their manufacturing; • used by biomass recovery companies under certain conditions.	

[295] https://selectra.info/energie/guides/comprendre/taxes/ticgn
[296] ibid

The Netherlands

Component 1 – the commodity price

For investigated profiles, the commodity prices in the Netherlands provided in this study are the January 2023 observed prices for TTF, provided by the CREG.

Component 2 – network costs

Transport costs

The Dutch natural gas transport network is operated by the TSO Gasunie Transport Services and serves distribution networks and direct exit points. According to the Gas Act (Article 10, paragraph 6b), it is the duty of the Dutch TSO, Gasunie Transport Services to provide an applicant with a connection point if the connection has a flow rate greater than 40 m^3 per hour. Consequently, we consider that profiles G0, G1 and G2 are directly connected to the transmission network.

Since 2020, transport tariffs have changed of structure. Following the principles of the 'Network code on harmonized transport tariff structures for gas' (NC-TAR), decided by the European Commission, the Netherlands has simplified its tariff's structure. They are therefore only composed of 2 components, which can vary depending on the contracted capacity:

Table 116: Network cost component in the Netherlands

Transport costs	
Component	**Explanation**
Entry capacity fee	Fee depending on the entry point and function of the contracted capacity (expressed in EUR/kWh/year).
Exit capacity fee	Fee depending on the exit point and function of the contracted capacity (expressed in EUR/kWh/year).

The Dutch network is essentially supplied with the so-called "Groningen-gas". This natural gas has a lower calorific value (L-gas) than the natural gas used in most of Western Europe (H-gas). Yet, as the Dutch transport tariffs are fixed in terms of capacity and expressed in EUR/kWh/year, this evens out this calorific value effect. While Gasunie Transport Services used to offer individualised rates for the entry and exit capacity fees, it is no longer the case. One single exit capacity fee as well as one entry capacity fee is used for the 328 directly connected industrial consumers.

Component 3 – all other costs

Unlike previous years, and as it is the case for residential and small professional consumers, only one surcharge remains in the Netherlands, namely the Energy Tax ("Regulerende Energie Belasting", or REB). In the 2023 Tax Plan, the Dutch government has indeed proposed to simplify the energy tax system by including the rates for the surcharge for sustainable energy and climate transition ("Opslag Duurzame Energie", or ODE) directly in the energy tax. As a result, all ODE rates for the year 2023 are reduced down to 0,00 EUR. (As from 2024, the ODE will be formally abolished)[297]

[297] https://www.vattenfall.nl/grootzakelijk/energiebelasting/tarieven/

The Energy Tax (REB) varies, in a degressive trend, according to the amount of consumed electricity as shown in the table below[298]:

Table 117: Electricity Energy Tax and ODE bands (Netherlands, 2023)[299]

Band	Consumption (in kWh)	Energy Tax (EUR/m³ – VAT excl.)	ODE levy (EUR/m³ – VAT excl.)
1	Up to 170.000	0,48980	0,00000
2	170.001 – 1.000.000	0,09621	0,00000
3	1.000.001 - 10.000.000	0,05109	0,00000
4	> 10.000.000 (professional)	0,03919	0,00000

Given the consumption level of our profiles under study, they fall into the following bands: band 3 for G0 and band 4 for EG1 and G2 profiles.

As the Energy tax and ODE Levy are fixed in euros per volume units (EUR/m³) and not in euros per energy units, the calorific value of the used natural gas has an impact on the total amount paid. We thus use a weighted average in function of the calorific value distribution of all-natural gas industrial users directly connected to the transport grid in the Netherlands. Out of the 328 industrial consumers[300] directly connected to the grid, the following table depicts the allocation of companies using which type of natural gas (H, G or G+)[301]:

Table 118: Companies directly connected to the transport grid in the Netherlands

Natural gas type	Number of companies directly connected to the transport grid	Percentage of companies directly connected to the transport grid per gas type (%)
H-Gas	99	30%
G-Gas	26	8%
G+ Gas	203	62%

As it is the case for electricity, some exemptions and reductions exist for natural gas regarding large industrial consumers:

1. A Tax refund scheme ("teruggaafregeling") is applicable to public and religious institutions such as clinics, schools, sports centres, churches, etc. We assume that our profiles are not part of these specific categories and thus do not take this specific scheme into account.

2. Industrial consumers are exempted if they use naturas gas:
   - not as fuel nor as an additive or filler substance;
   - for metallurgical and mineralogical processes;
   - as fuel for commercial shipping;
   - in the case of Power-Heat Coupling installations ("*WKK* installaties") when gas is used to generate electricity in an installation with an electrical efficiency of at least 30%.

As we do not consider profiles G0 and G1 as consumers using natural gas as a fuel or natural gas that has been used as an additive or filler substance, we present the maximum option (no refund applicable) for both profiles. Considering that G2 can represent a large consumer using natural gas as a feedstock for its industrial processes, we assume that it can be granted an exemption of taxes and we, therefore, present a range between the minimal option (totally exempted from taxes) to the maximum option (no refund applicable) for this consumer profile.

[298] A lowered tariff also exists for agricultural heating installations. We assume our profiles do not benefit from the lowered tariffs.

[299] https://www.vattenfall.nl/grootzakelijk/energiebelasting/tarieven/

[300] As we could not update the source of this information for this year update, the figures were carried over from the last editions of this report.

[301] G- and G+ Gases are both considered as L-Gas. In this study, they are considered as having the same calorific value and the same conversion factor to kWh, namely 9,77 kWh/m³.

The UK

Component 1 – the commodity price

The National Balancing Point is the referent market index regarding the UK. For all investigated profiles, the national commodity price is the result of January 2023 prices for NBP. The CREG provided all commodity price data.

Component 2 – network costs

Transport costs

As already mentioned for our residential and small professional profiles, there is only one TSO in the UK (except for Northern Ireland): National Grid Gas. The Gas Transmission Transportation Charges are comprised of the following components:

Table 119: Transport costs components in the UK

Transport costs	
Component	**Explanation**
Entry Commodity Charge	A charge per unit of natural gas transported payable for flow entering the system, expressed in p/kWh/day.
Exit Commodity Charge	A charge per unit of natural gas transported payable for flow exiting the system, expressed in p/kWh/day.
Commodity charge	A charge per unit of natural gas transported payable for flows entering and exiting the system expressed in p/kWh.
Compression charge	Additional charge payable where natural gas is delivered into the National Grid NTS system at a lower pressure than that required, expressed in p/kWh.

National Grid Gas provides a weighted average of the entry and exit capacity tariffs in their Statement of Gas Transmission Transportation Charges.[302]

Distribution costs

Industrial consumers that are still connected to the distribution grid are also subjected to their tariffs, and this is the case for the G0 and G1 profiles. The UK has eight DSOs for natural gas, amongst which four are owned by Cadent Gas. The distribution tariff for natural gas is composed of four components:

Table 120: Distribution cost components in the UK

Distribution costs		
Component	**Explanation**	**Profile**
LDZ System Capacity Charge	With charge band with 732.000 kWh and above LDZ charges are based on functions, these functions use Supply Point Offtake Quantity (SOQ) in the determination of the charges. The LDZ System capacity charge is expressed in p/Peak day kWh/day and the LDZ System commodity charge in p/kWh.	G0 and G1
LDZ System commodity Charge		
LDZ Customer Capacity Charge	With charge band with 732.000 kWh and above customer, the capacity charge is based on a function related to the registered SOQ. Expressed in p/peak day kWh/day.	
Exit Capacity Charges	A capacity charge applied to the supply point similar to LDZ System Capacity Charge. These charges are applied per exit zone on an administered peak day basis and are expressed in GBP/year.	
Metering charges	A cost for use and management of your energy meter, which is expressed in GBP/year.	

[302] We have used the weighted averages published in the Gas Transmission Transportation Charges of the NGG valid as from the 1st of April 2020, (Nationalgrid, 2020).

An average of these components is presented across all active DSOs for natural gas in the UK.

The capacity terms are based on the estimated maximum daily offtake. This is calculated by dividing the total consumption in a year by the number of days of consumption multiplied by the load factor. This load factor is related to the EUC (End User Category) bands. Each local distribution zone has 33 individual EUC bands that define 9 different consumption profiles based on annual consumption. The load factors, therefore, differ depending on the annual consumption of a profile and the local distribution zone[303]. Each DSO has its own load factor percentages, but only Northern Gas Networks discloses its load factors, which we used as a proxy for all other DSOs. The table below depicts load factors used for profiles G0, G1 and G2:

Table 121: Load factors for profiles G0, G1 and G2

Profile	Bands	Threshold (kWh)	Average load factor
G0	4	732.001 - 2.196.000	38,20%
G1/G2	9	58.600.000 - 99.999.999.999	66,30%

Based on this, the capacity term is computed as follows:

$$Annual\ charge = (SOQ * 365\ days) * unit\ rate$$

Where,

$$SOQ = annual\ consumption / (365\ days * Load\ Factor)$$

Component 3 – all other costs

The **Climate Change Levy** (CCL) is applicable to the consumption of natural gas for businesses in the industrial, public services, commercial and agricultural sectors. This levy is "an environmental tax charged on the energy that businesses use. It's designed to encourage businesses to be more energy efficient in how they operate, as well as helping to reduce their overall emissions."[304]

The following table gives an overview of the rates that are charged to professional consumers regardless of their profile:

Table 122: Climate Change Levy rates on natural gas[305]

Time period	Natural gas rate (GBP)
1st April 2022 to 31st March 2023	0.568p/kWh
1st April 2023 to 31st March 2024	0.672p/kWh
1st April 2024 to 31st March 2025	0.775p/kWh

[303] Load factors for bands 3 to 9 (from 293 MWh to 58,600 MWh/year) are determined based on a Winter Annual Ratio (consumption between December to March over annual consumption).

[304] https://www.sefe-energy.co.uk/help-and-support/bills-payments/what-is-the-climate-change-levy-ccl/

[305] ibid

6. Presentation and interpretation of results

6. Presentation of results

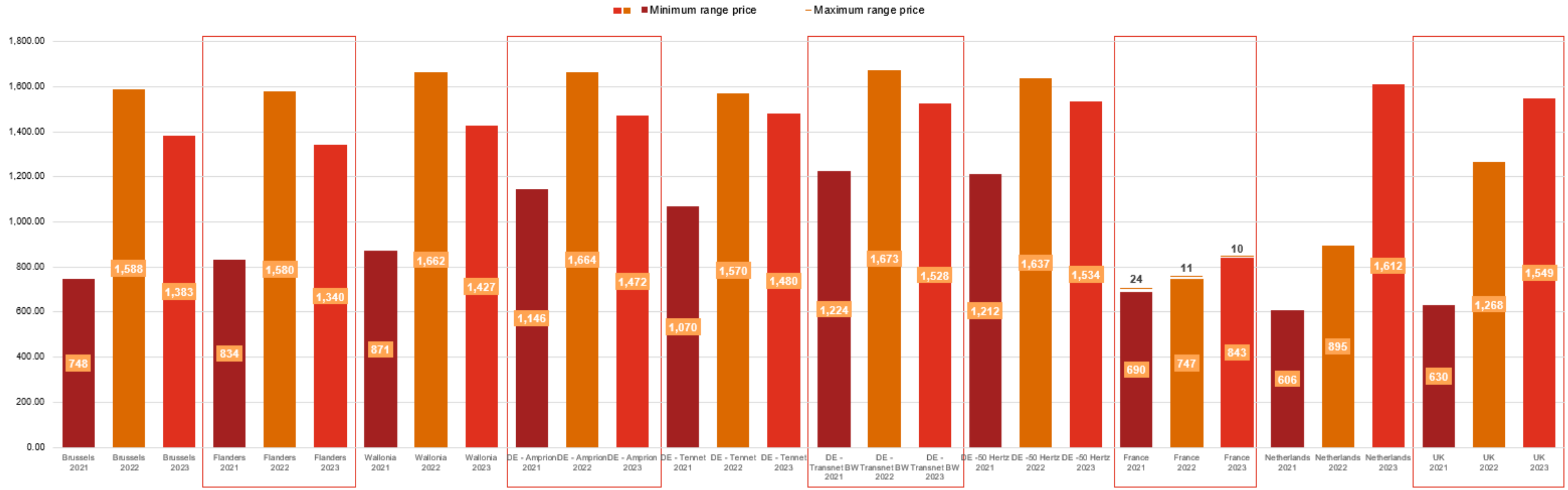
Presentation of figures (Electricity)

Profile E-RES (Electricity)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by a residential consumer (E-RES) in the different studied countries and regions. The results are expressed in EUR/year.

Figure 27: Total yearly invoice in EUR/year for residential consumers (profile E-RES)



Similarly to last year, Belgium is split into three regions and Germany into four regions because of regional differences. The other countries under review – France, the Netherlands, and the UK – are represented as one single result. The reasoning behind the distinction between regions was already set out above with an additional explanation of how the countries organise themselves regarding energy regulation. Furthermore, we show the results of the computations of 2021 (burgundy), 2022 (orange) and 2023 (red) and have added frames to easily identify different regions/countries.

Differently from the previous year, Belgium has become the second cheapest country for this profile, after France which has been the cheapest for two years. Compared to 2022 the total invoice has increased in only 3 regions out of the 10 regions/countries under review. Even though this is the smallest electricity profile under review, we already see that there's a price range in France. The price range (minimum and maximum) is the consequence of the possibility to opt for the CU4 or MU4 network cost option which also has an impact on the CTA. The figure below thus shows a range for the network and all other cost components.

France has remained the cheapest country with Belgium as a close second. As it will be shown more in detail in the next section with the analysis per component, the large increase in the total invoice in the Netherlands can be mainly explained by the change in the tax refund scheme policy reduction and the VAT having been set back to its pre-energy crisis level.

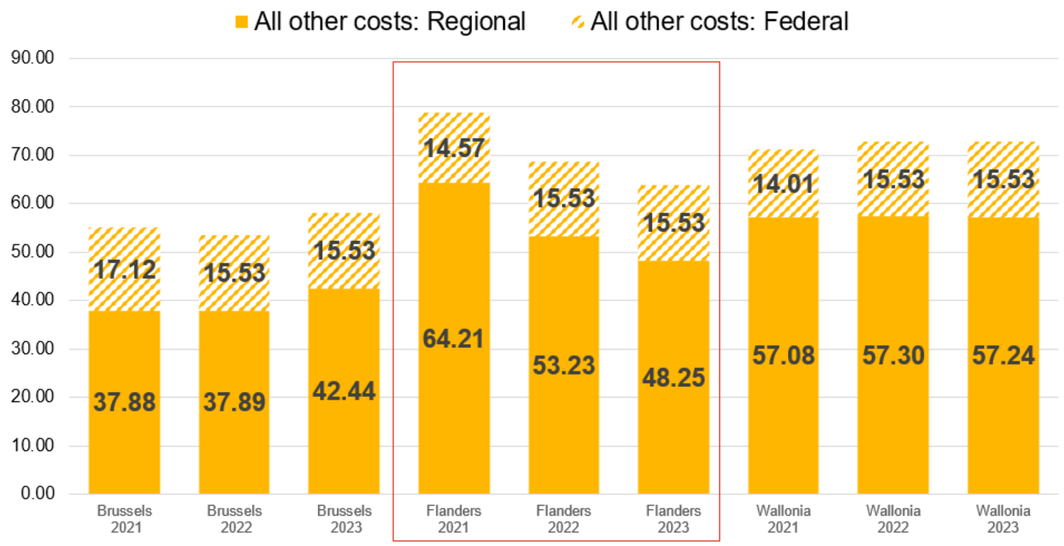
Belgium is relatively competitive regarding the E-RES profile, though France still has a very low bill compared to all other countries. Concerning the positioning of the Belgian regions, Flanders is (similarly to last year's study) the most competitive Belgian region, followed by Brussels.

Breakdown per component

The previous results are further detailed for profile E-RES by the figure underneath, which provides a closer look at the breakdown of the different price components.

Figure 28: Electricity price by component in EUR/MWh (profile E-RES)

Figure 29: Regional and Federal all other costs in Belgium in EUR/MWh (profile E-RES)



The ***commodity component***[306] is by far the lowest in France (97 EUR/MWh). The largest increase in this component is observed in the Netherlands, namely an increase of 53 EUR/MWh. This year, we observe increases (France, the Netherlands, the UK, some regions of Germany) and decreases (Belgium, some regions of Germany) of the commodity price. The decrease of the commodity price in Belgium can be partly explained by the change in methodology for price computation on the price comparison tools used by each region's energy regulator. Instead of taking historical prices to estimate prices, a forward-looking price methodology is being used. France has seen the increase being limited to 23 EUR/MWh, compared to 2022 and 33 EUR/MWh compared to 2021, while for the other regions the commodity component is two to four times the value of 2021. This can be explained by the fact that in France the standard product for residential consumers is regulated by the Government, thus not reflecting the market increase of the commodity price all over Europe. In the UK, the energy price cap and energy price guarantee, measures introduced by market regulator OFGEM, allows to absorb in the UK the increase in commodity cost observed in the beginning of 2023. The first measure sets the maximum level of prices per kWh of gas and electricity for the default tariff that each energy supplier offers to residential customers.[307] The cap is reviewed four times a year, with the last update in April 2023. The second measure protects customers from increases in energy costs by limiting the amount suppliers can charge per unit of energy used[308].

The ***network cost*** component has proportionally slightly increased in all regions/countries under review. The UK has the highest network cost, followed by the German Transnet BW region. While important network cost reductions are in place for the large industrial profiles in Germany this is not the case for the residential consumers. In the UK the high network cost is mainly because of Transmission costs (TNUos) which is computed based on the consumption of the consumer (p/kWh) and compensates for the very low commodity component. On the Belgian front we see that the network costs are still the highest in Wallonia. The network cost component is slightly increasing in Brussels, while Flanders has become the second Belgian region with the lowest network cost with 66 EUR/MWh, due to the change of tariff structure and the introduction of the capacity tariff (explained in Chapter 4).

[306] While this methodology to estimate commodity costs provide a fair view of the market situation in the respective countries and regions, one must be aware that it does not provide a full overview of the market prices as only three to five products were considered.

[307] (OFGEM, 2022)

[308] (GOV.UK, 2023)

The ***all other costs component***[309] has decreased or remained stable in all regions/countries under review, except for the UK. This component was very low last year in the Netherlands in 2022 due to the refund (*Belastingvermindering*) consumers (E-RES and E-SSME) can obtain. This fixed amount of 681,63 EUR/year in 2022 has decreased to 493,27 EUR/year in 2023, compared to 461,62 EUR/year in 2021. Therefore, for the E-RES profile in the Netherlands, this negative tax allows to partly offset the increase of the commodity component. This component has a low impact on the overall position of Belgium compared to the other regions/countries, due to the amount oscillating among comparable values. The UK is the most expensive region in 2023, having the highest "all other costs", where the increase compared to last year is mainly explained by the increase in commodity price as this is used to calculate the "Energy company obligation" tax. In Belgium we have made a distinction between the regional and federal all other costs and we observe that the regional costs are the biggest part of the "all other costs" component. The decrease in regional costs in Flanders can be explained by : the reduction of the energy fund contribution levy on the electricity offtake points and the restructuration of the tariffs applied by the DSOs. Costs in Brussels have at the opposite been increasing, mainly due to higher Public Service Obligations tariffs. Regarding the federal costs, we observe stability compared to 2022 in all three regions.

Finally, we also must take the ***VAT*** into account since this is a residential profile. The VAT rate is similar across most regions and countries, except the UK with a rate of 5%, and Belgium where the rate has been, to this date, permanently reduced to 6% as a measure to alleviate the increase in electricity and gas bills for small consumers. The UK has the lowest VAT because of the low rate they apply on energy, followed by France that has the lowest total invoice. For the other countries, VAT mainly depends on the total invoice of the region/country.[310]

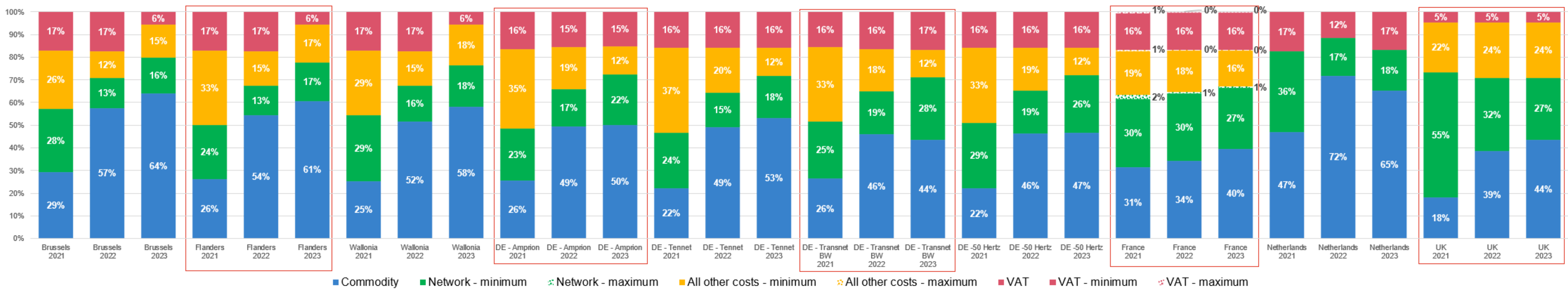
[309] This cost includes taxes, levies and certificate schemes.

[310] The VAT rate is not always applied on the whole total invoice since some tariffs are exempted.

Proportional component analysis

The percentages of the costs for each component can be found in the figure below.

Figure 30: Proportional component analysis for electricity (profile E-RES)



The graph above represents the weights of each component in the total invoice. It is interesting to see how the countries/regions are similar or differ when not looking at the absolute values. In the Netherlands we show the weights of the commodity, network and VAT components **before** deducting the all other costs reduction, since in 2022 the other costs are below zero (- 446 EUR) and act as a “discount” of 33% over the total invoice. In addition, a price cap of 0,40 EUR/kWh (VAT, levies, network and other costs included) has been set on small consumers profiles (E-RES and E-SSME), for up to a consumption of 2.900kWh. The remaining consumption is paid at market price. Germany has set a similar price cap for small consumers in March 2023 (with a retroactive effect on January and February) (E-RES and E-SSME), with a maximum of 80% of the historical annual consumption tariffed at 0,50 EUR/kWh (VAT, levies, network and other costs included). The remaining part of the bill being paid at market price.

A few things stand out when observing the graph. Firstly, compared to previous years we observe that the share of commodity cost component increased in all countries, except for the Transnet region and the Netherlands. The region/country with the highest share of the network costs are the UK and the German Transnet region, respectively 27% and 28% of the total invoice. Secondly, we see that the impact of the VAT reduction in Belgium increases the share of all other costs, network and commodity costs in the bill. As stated above, for the Netherlands we do not show the “all other costs” component on the figure since it is below zero, acting as a reduction on the total relative price. Lastly, when looking at Belgium, we see that Flanders and Wallonia have the highest relative all other costs component. When comparing the all other costs components of the Belgian regions with France (i.e. the cheapest country for that profile), we see that there is not a remarkable difference regarding the relative importance of the “all other costs” component over the total bill (while excluding the exceptional case of the Netherlands).

KEY FINDINGS

The profile of residential consumers (E-RES) suggests the following findings:

- The **total invoices for the different regions/countries under review show quite some variation**. Unlike last year, the Netherlands is the most expensive country followed closely by the UK and Germany, while France is the least expensive one. The total invoice in France (843 EUR/year) is representing 60% of the total invoice of Belgium regions (1.383 EUR/year). The high cost in the Netherlands can be explained by the tax refund alleviation from the government (*Belastingsvermindering*) which contributed in 2022 to reduce relatively highly the impact of the higher commodity price. We also note that France is the cheapest country because of the “Tarif bleu” regulated product, accounting for most of the market.

- The **relative position of Belgium did improve compared to last year**, being the second cheapest country/region under review. It is the second cheapest country after France. Flanders is the cheapest region in Belgium and the second cheapest region among the regions/countries under review.

- Similarly to last years, the **commodity component** has stayed an important component to determine the competitiveness of a region/country due to the peculiar market conditions since the last months of 2021. Countries that offer a regulated product at lower cost, such as France or the UK, were able to maintain the commodity costs lower than other countries. Some countries also set up a price cap on the energy bill, such as Germany or the Netherlands. Depending on the mechanism in place (and the budget allocated to it), this measure can be more (Germany) or less (the Netherlands) efficient to protect end-consumers. For the Netherlands and Belgium, we observe an increase of the proportion of the commodity component over the total bill, accounting to more than 55% of the total cost in Belgian regions (average, due to the VAT reduction), and more than 65% for the Netherlands. This observation for the Netherlands, though they introduced a capping mechanism, shows that the effects on the bill of the consumer compared to its neighbouring countries is low.

- Compared to 2022 the **network costs** component has increased in all regions/countries except for France and the UK. From a Belgian perspective, we observe that Brussels has the smallest network cost, followed by Flanders. The introduction of the new distribution tariff structure in Flanders does not have an impact on its competitive position. The relative importance of this component is similar across Belgium and France, while it is the highest in the UK some regions in Germany, where the networks costs account for almost one third of the total invoice. The increase of commodity components in most regions and countries is matched by a more important increase of network costs for most regions, except in the UK.

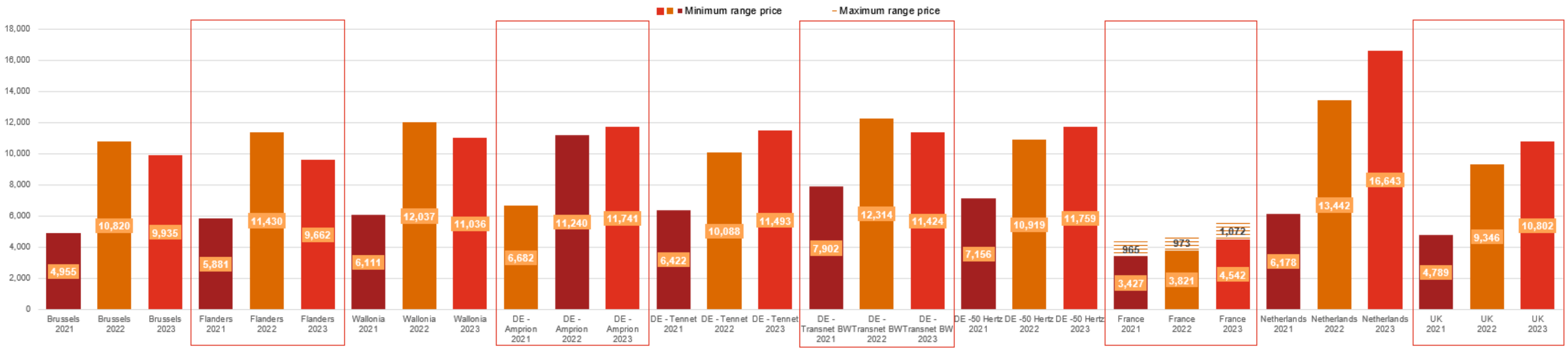
- The **all other costs component** plays a big role in the competitive position of the region/country, in particular the tax advantage lowering the total cost in the Netherlands. In Belgium we have made a distinction between the regional and federal all other costs and we observe that the regional costs have decreased only for Flanders. Flanders is exactly in between Brussels and Wallonia. The Belgian all other costs component is very high, in absolute terms, compared to all regions for E-RES. It is only overtaken by the UK, presenting exceptionally high costs two years in a row.

Profile E-SSME (Electricity)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by a small professional consumer (E-SSME) in the different studied countries and regions. The results are expressed in EUR/year.

Figure 31: Total yearly invoice in EUR/year (profile E-SSME)



Similarly as from the annual invoice of the E-RES profile, the Netherlands stays the most expensive country, because the all other costs and network component increases cannot offset the relatively low (to the other countries) increase in commodity costs. France is again the cheapest zone, while Belgium and the UK are the second and third least expensive ones. The total invoice has increased half of the regions/countries compared to 2022. The biggest increase (around 3.200 EUR) is observed in the Netherlands. In Belgium the cost has decreased in all the three regions, partly due to a change in the methodology of regulators' price comparison tools using forward-looking prices rather than historical prices in order to estimate bills amounts. Wallonia stays the most expensive region in Belgium with a bill of around 11.000 EUR per year. The breakdown per component below will detail which components have the most influence on the total invoice.

Breakdown per component

The previous results are further detailed for profile E-SSME in the figure below, which provides a closer look at the breakdown of the different price components.

Figure 32: Electricity price by component in EUR/MWh (profile E-SSME)

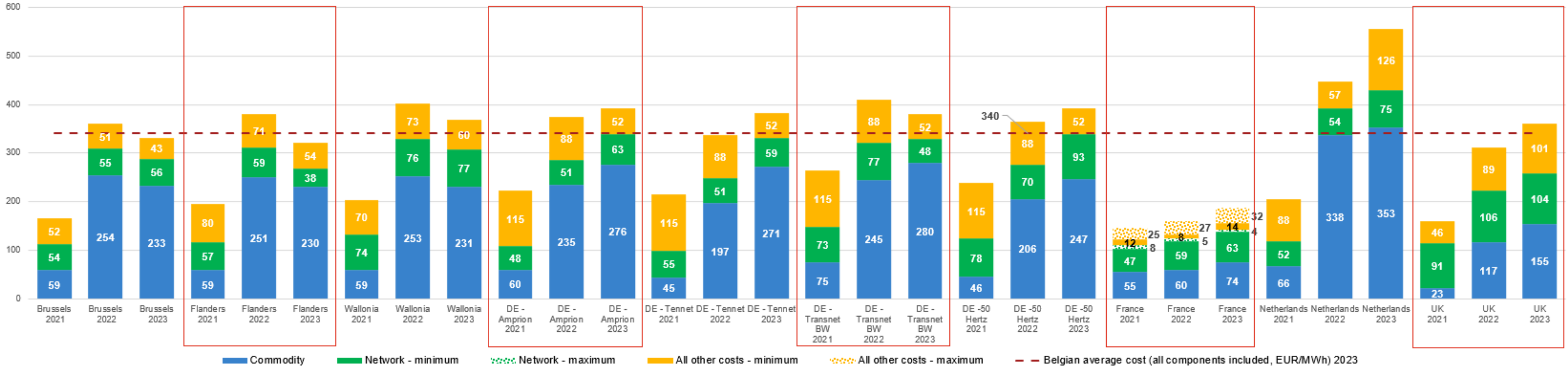
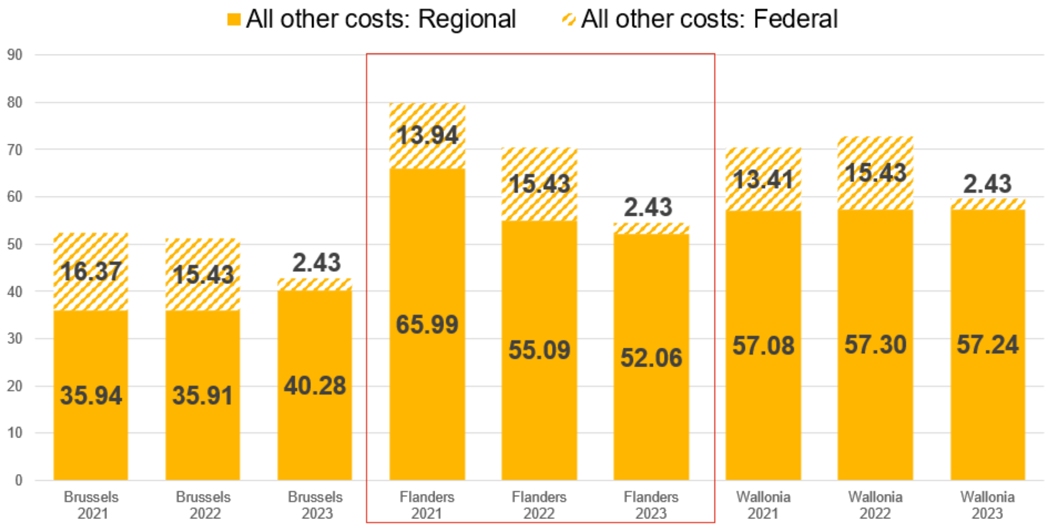


Figure 33: Regional and Federal all other costs in Belgium in EUR/MWh (profile E-SSME)



The **commodity component**[311] has increased in almost all regions/countries under review, with the German region Tennet having the highest increase compared to the previous year (+74 EUR/MWh). Belgium is the only country presenting a commodity cost decrease, due to the change in methodology on the comparison websites, as explained above. The commodity component is higher in Brussels, across the Belgian regions, and it is always lower than the values observed for the German ones, while France can offer the cheapest price because of the regulated product “tarif bleu”. After France, Belgium is the 2nd cheapest region. Like E-RES profile, in the UK the E-SSME profile benefits from the price cap introduced by the OFGEM that limits the increase of the energy bill, and the energy price guarantee, explained in the section related to the E-RES profile.

For the **network component** we can see that it increased for most of the regions under review (8 out of 10), except for German Transnet and Belgium Flanders regions where there was an important decrease. The largest increase can be observed in the German 50 Hertz region where the network component increased by 23 EUR/MWh, followed by the Netherlands increasing by 21 EUR/MWh. For all the other regions the increase is limited to a maximum of 12 EUR/MWh. Flanders is the region showing the lowest network costs, due to a change in the tariff structure in the region. The UK is again the country with the highest network cost, being 200% higher than the one of Belgium and 150% of France. The network cost per MWh is on average slightly less expensive than the cost of the E-RES profile. Lastly, we see that the ranges of the network costs in France are starting to increase compared to E-RES.

The **all other costs component**[312] is the lowest in Belgium Brussels region and France. The highest is in the Netherlands followed by the UK. We observe that the range in France is growing compared to E-RES. When taking the minimum range of France into account we see that France is still a lot less expensive than Brussels, the 2nd cheapest region for this profile. In Belgium we see that the regional component of the all other costs is decreasing since 2022, while the regional all other costs components decreases to 15% of its 2022 value. We observe a relevant decrease in Flanders of 3 EUR/MWh compared to the previous year and an increase of 4,3 EUR/MWh in Brussels. Similarly to E-RES, this is mainly explained by two factors: the reduction of the energy fund contribution levy on the electricity offtake points.

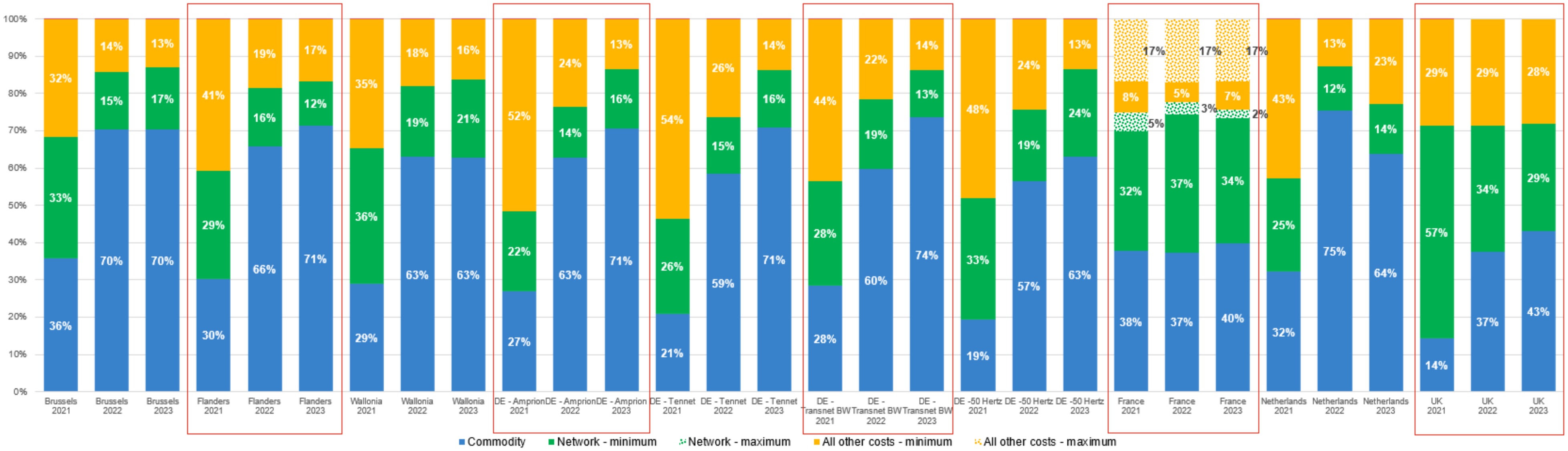
[311] While this methodology to estimate commodity costs provides a fair view of the market situation in the respective countries and regions, one must be aware that it does not provide a full overview of the market prices as only three to five products were considered.

[312] This cost includes taxes, levies and certificate schemes.

Proportional component analysis

The percentages of the costs for each component can be found in the underneath figure.

Figure 34: Proportional component analysis (profile E-SSME)



The relative importance of the **commodity component** has increased in most regions/countries (7 out of 10) under review. This component is the most important in most German regions (>70% for 3 out of 4 regions). In contrast, the UK and France are the two only countries where the **network cost** component makes up less than 43% of the total invoice in 2023. Lastly, we observe that the **all other costs component** accounts for a smaller proportion of the total invoice compared to last year, except for the Netherlands where it almost doubles due to the reduction of the tax scheme refund. This overall reduction can be explained by the fact that the all other costs did not change as much as the commodity and network components did in the past year, thus losing its weight in the total bill against the commodity. The percentual analysis also shows the convergence of the weight of the all other costs over the total bill between the three Belgian regions, with the three regions having between 13% and 17% of their bill as other costs.

KEY FINDINGS

The results reported above suggest the ensuing key findings regarding profile E-SSME:

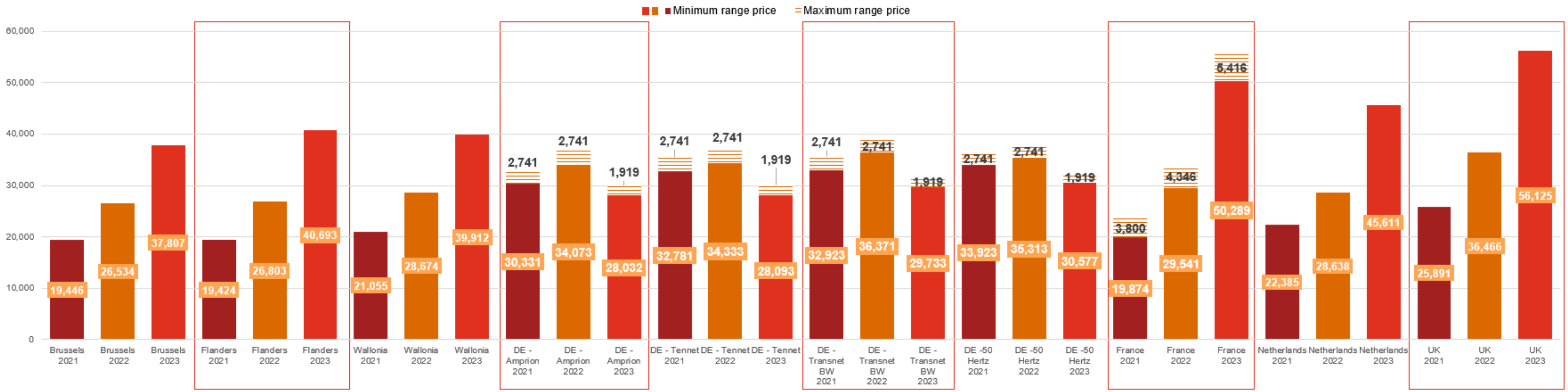
- The **Netherlands is the most expensive region in 2023**, while it was among the three cheapest zones in 2020 and 2021. The total invoice is between a minimum of 9.600 EUR/year to a maximum of 16.8643 EUR/year in the Netherlands. The lowest bill in Germany is observed in the Transnet region, where the lower price of the “Grundversorgung” drags down the weighted average among the products selected. France is the cheapest country, and it is the only one where the increase of the commodity component has not followed the general market trend in similar proportions, because of the regulated product. The second cheapest country is Belgium (10.211 EUR/year), but the gap between France and Belgium is still significant.
- **Flanders is this year the most competitive Belgian region**, becoming the second cheapest region among the zones under review. The competitive position of Flanders is mainly thanks to a lower network costs component.
- Compared to last year, the **commodity component** still represents the biggest part of the energy bill for all the zones under review, reaching even more than 70% in most Belgian and German regions. In France we observe the lowest relative weight, reaching 40% of the total energy bill. The Netherlands is again this year, the region with the highest commodity price in 2023.
- We observe quite some variation regarding the **network component**. The UK is an outlier, but we see that the component is quite similar between the other regions. In most of the regions under review, the relative weight of the network component over the total bill increased mainly due to the decrease of the all other costs component share. We observe regional differences in Germany with regards to the network component, ranging from 48 to 93 EUR/MWh, and in Belgium, ranging from 38 to 77 EUR/MWh. In Flanders, the new distribution tariff structure leads to a significant decrease of network costs compared to 2022 for this profile.
- The **all other costs component** is higher in the Netherlands and the UK. We observe the highest increase compared to 2022 in the Netherlands, because the energy tax increased. In France we observe that the minimum and maximum ranges start to play an important role with the E-SSME profile with regards to the all other costs component. Belgium regions on average see their all other costs components decrease by a 20-25% rate, mainly due to reduced regional costs.

Profile E-BSME (Electricity)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by a big professional consumer (E-BSME) in the different studied regions and countries. The results are expressed in EUR/year.

Figure 35: Total yearly invoice in EUR/year (profile E-BSME)



First off, we observe that for the E-BSME profile (and larger profiles) we also must take a range into account in Germany, because of a possible reduction of the *Konzessionsabgabe*. While this does not change their competitive position compared to other regions/countries for this profile it will have an impact for the bigger consumers as detailed below.

Secondly the total yearly invoice has increased in all the regions/countries under review, except for all regions of Germany. This is in large part due to the price cap applied to all profiles and limiting 70% of the historical consumption to 0,13 EUR/kWh. The biggest change is an increase in the Netherlands (21.000 EUR/year) and in the UK (20.000 EUR/year). The German regions, are the four cheapest regions in 2023. The sharp increase in the total bill for the UK and the Netherlands (as well as most regions/countries) is mainly explained by the higher commodity price compared to the previous year.

The competitive position of all the Belgian regions have slightly deteriorated compared to the E-SSME profile. While Flanders has become the most expensive region in Belgium, Brussels remains the most competitive region in the country, and the fifth (after all German regions) overall.

Breakdown per component

The previous results are further detailed for profile E-BSME in the following figure, which provides a closer look at the breakdown of the different price components.

Figure 36: Electricity price by component in EUR/MWh (profile E-BSME)

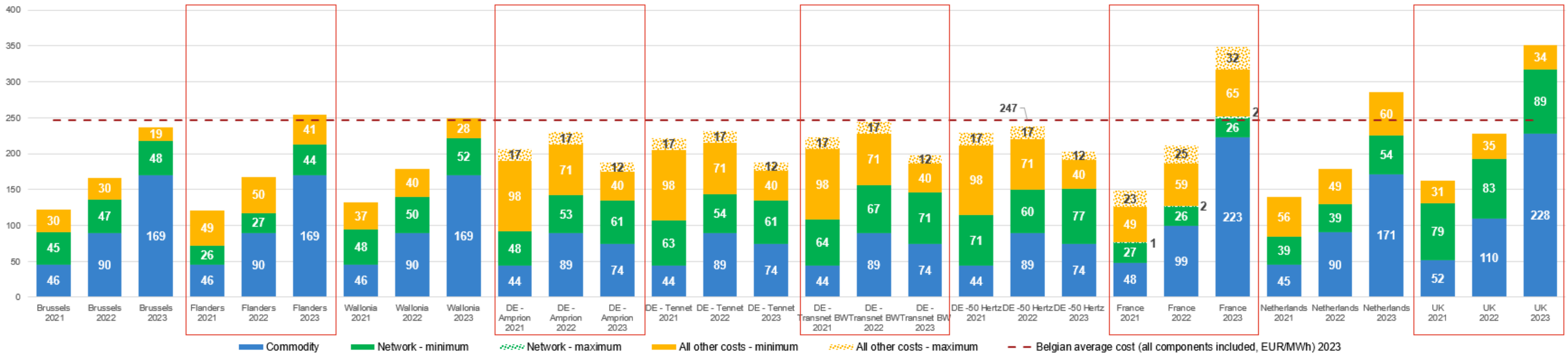
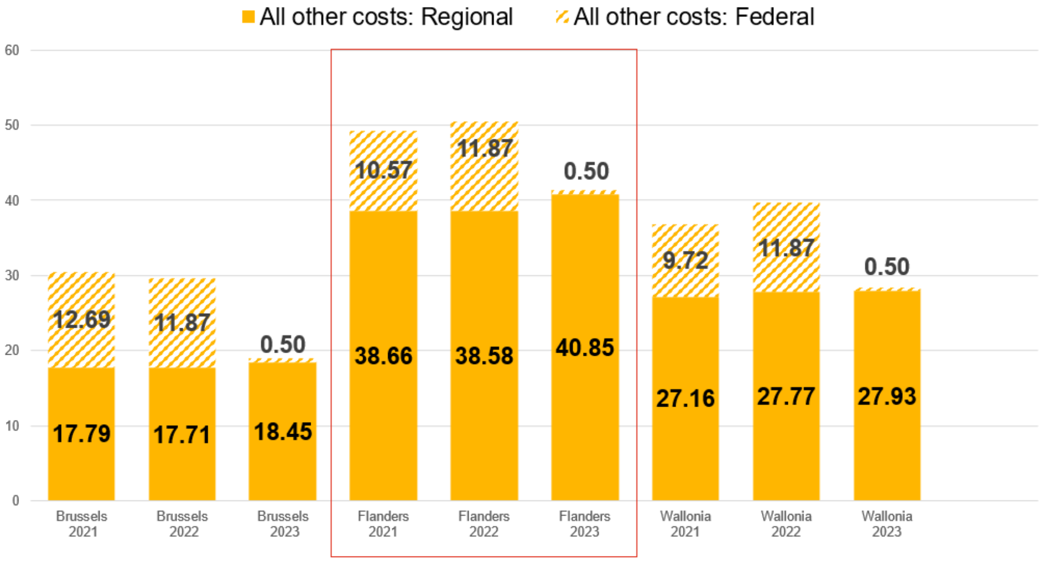


Figure 37: Regional and Federal all other costs in Belgium in EUR/MWh (profile E-BSME)



The **commodity component** increased for all the regions/countries under review, even doubling the amounts of the previous year for some regions/countries, except for Germany. The reason is methodological. The price cap of 0,13 EUR/kWh for up to 70% of the historical consumption including VAT, the commodity costs virtually lowered in order to give a picture of the competitiveness of the country[313]. The highest increase can be observed in the UK where the commodity price has more than doubled compared to 2022 and reached 228 EUR/MWh. Since the price is now computed according to a formula and no longer by using comparison websites, in each country it remains the same for all bigger industrial profiles in EUR/MWh, except for E3 and E4 where the formula is slightly adapted to consider a 7 days working week. In France the commodity component is adjusted according to the ARENH principle, hence showing some variation between the industrial profiles.

The **network cost** has slightly increased or remained stable in most regions/countries under review. We observe a relevant increase of 17 EUR/MWh in Flanders, which is the highest increase observed in the panel, although the network costs in Flanders remain the second lowest only behind France. The UK is again the country with the highest overall network costs, reaching the maximum of 89 EUR/MWh in 2023. In the regions/countries where we observe an increase, this is for most between 5 to 15 EUR/MWh. Belgian position with regards to the network component is better than previous years, as it overall ranks second cheapest after France. Wallonia is the most expensive Belgian region with network costs of 52 EUR/MWh in 2023. The higher network costs in the UK deteriorates its competitiveness, while the same effect is observed for the Netherlands, increasing from 39 to 54 EUR/MWh.

The **all other costs component**[314] is very large in France and the Netherlands, compared to last year. We observe a general decrease in the all other costs component for all German and Belgium regions, being 30 EUR/MWh less expensive than last year for Germany and around 11 EUR/MWh more competitive in Belgium compared to last year. Belgium's better competitiveness on that component is due to the federal costs being only < 5% of their value of 2022. When the reduction applies in France, the all other costs component becomes just slightly more expensive than the Netherlands, but still remains the highest. In Belgium, Flanders has the highest all other costs component. The all other costs price per MWh decreased intensively compared to the small professional profile (E-SSME) in all regions/countries, except for Germany where it is the same cost, but with a potential reduction of 12 EUR/MWh. Like E-RES and E-SSME, the large decrease in the federal costs in all 3 regions compared to 2022 are improving the overall competitiveness of Belgium compared to its neighbouring countries.

[313] Starting from the following formula, the variable became the commodity cost, which virtually decreased as all other components are fixed or varying depending on the kWh used by the profile:

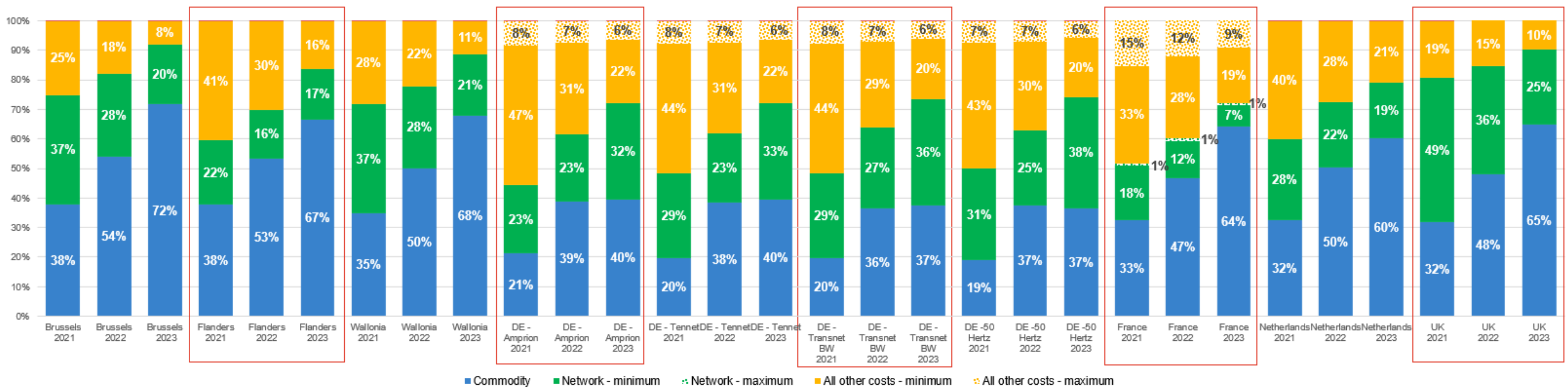
$$0{,}13 * Yearly\ Consumption * 70\% = 70\% * (All\ Other\ Costs + Network\ Costs + Commodity\ Costs)$$

[314] This cost includes taxes, levies and certificate schemes.

Proportional component analysis

The percentages of the costs for each component can be found in the figure below.

Figure 38: Proportional component analysis (profile E-BSME)



Unlike the previous profiles, the most relevant change we observe for the E-BSME profile in 2023 is the proportional increase of the **commodity component** over the total electricity bill, for all countries – whereas we had exceptions for E-RES and E-BSME. The commodity component accounts for 40% to even more than 70% of the total invoice. This increase explains the relative decrease in weight for the other components in all the regions/countries under review, even if we observed previously some slight increase in the **network cost** for most regions under review. On the Belgian level we observe that Flanders has a higher all other costs, with proportionally equal **network costs**. The **all other costs component** is still very important in Germany where it accounts for around 22% of the total invoice, and is even reaching 28% in France, due to the increase of the maximum tariff possible for the electricity excise.

KEY FINDINGS

As for the E-BSME profile, the results demonstrate the ensuing key findings:

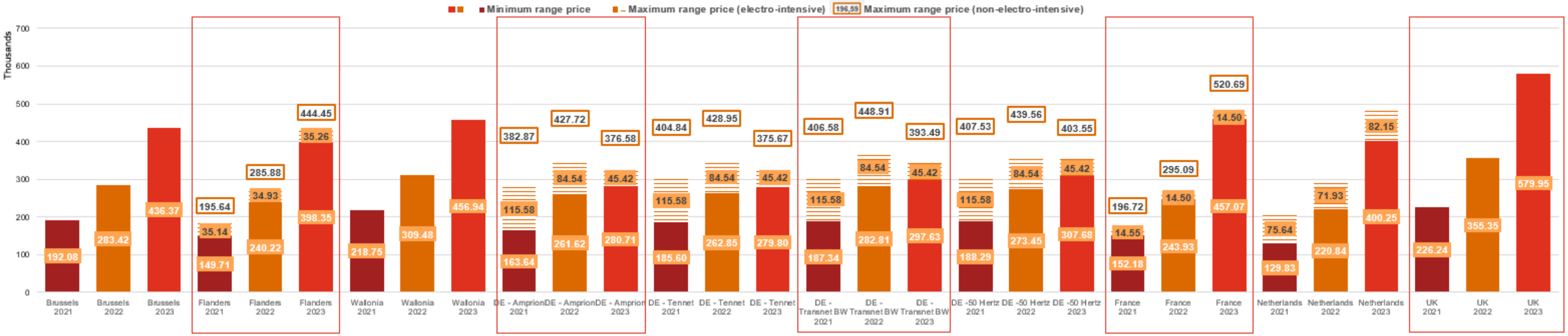
- The **total invoice has increased in all the regions/countries under review** and ranges from 28 kEUR/year (Germany Amprion) to 56 kEUR/year (the UK). All German regions are the cheapest, followed by Brussels, then Wallonia and Flanders. On the other hand, France, the Netherlands and the UK are still far behind the other countries regarding the E-BSME profile.
- **In Belgium, Brussels is the least expensive region**, followed closely by Wallonia, where the higher network costs are compensated by the lower all other costs. All the Belgian regions are less expensive than the other regions, except for Germany regions, in 2022. The lower commodity and all other costs are mainly responsible for their competitiveness compared to its neighbours.
- The **commodity component** has become a major part of the total bill, accounting for more than two thirds of the total invoice in some regions/countries under review. This commodity component vary quite a lot across countries, and is significantly higher in the UK and France compared to Belgium, Germany and The Netherlands.
- The **network costs component** varies across the reviewed regions/countries and goes from 28 (France) to 89 EUR/MWh (the UK). Flanders has a slightly lower network (44 EUR/MWh) cost than the other two Belgian regions, though overall Belgium network costs are still cheaper but comparable to the Netherlands network cost (54 EUR/MWh).
- The **all other costs component** and the reductions that can be applied are the most important factor when determining the competitiveness of a region/country. France's competitive position for example changes slightly compared to the UK when we take the minimum or maximum level of all other costs.

Profile E0 (Electricity)

Total invoice analysis

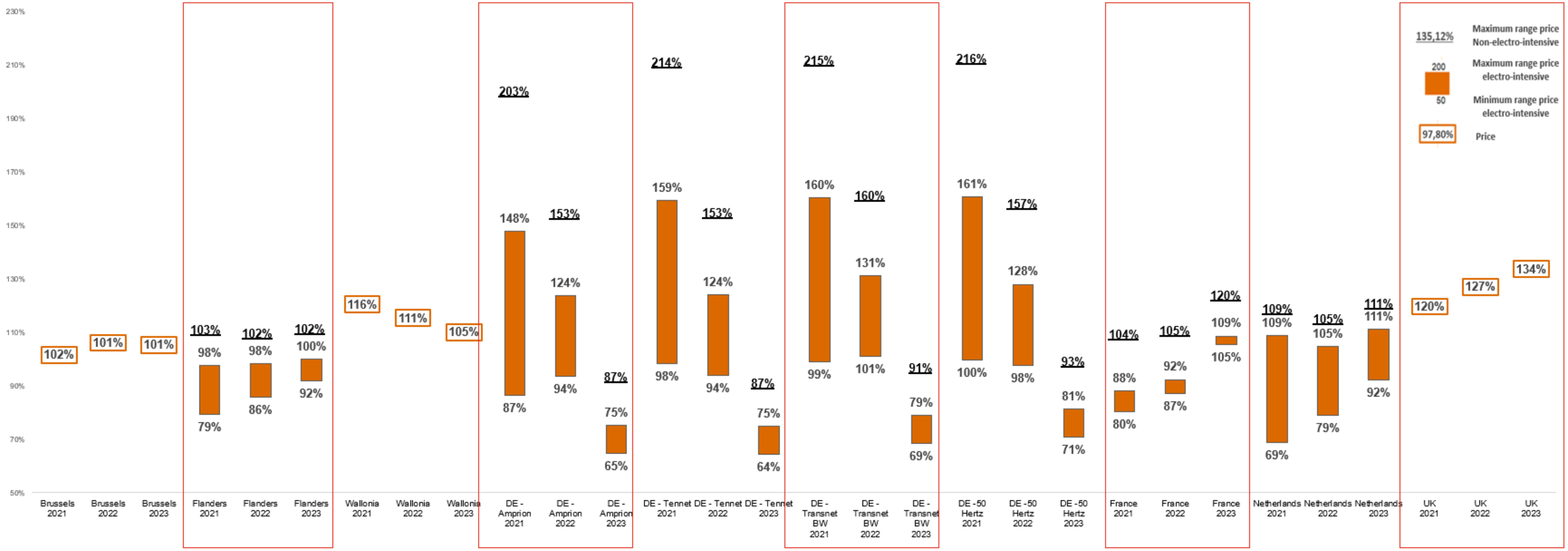
The figure below provides a comparison of the total yearly invoice paid by an industrial profile E0 in the different studied regions and countries. The results are expressed in kEUR/year.

Figure 39: Total yearly invoice in kEUR/year (profile E0)



Because of regional differences, Belgium is split into three regions and Germany into four regions. The other countries under review – France, the Netherlands and the UK – are represented as one single result. Below, we compare each region and country's yearly bill with the average Belgian price, which is set at 100. The Belgian average is computed as the mean between Brussels' and Wallonia's single price as well as Flanders' minimum and maximum prices (maximum for non-electro intensive consumers). We have also added a box with the total maximum price range for non-electro-intensive consumers since some reductions/exemptions will start applying on electro-intensive consumers from this profile onward.

Figure 40: Total yearly invoice comparison in % (profile E0; Belgium Average 2023 = 100)



Both above figures give us a lot of information about the total invoice and the competitiveness of the different regions/countries depending on which reductions and/or exemptions are considered. Because of the large number of ranges different regions/countries have the possibility to be the most competitive.

What is sure is that the UK, France and the Netherlands are not the cheapest region this year.

The competitive position of Germany has significantly improved, even with the introduction of reductions for electro-intensive consumers, due to the price cap applied this year. The total invoice for non-electro-intensive consumers in Germany is closer to the other countries, but still more competitive than all other regions/countries.

France has the smallest range for consumers that qualify as electro-intensive while the Germany Amprion and Tennet regions can have the lowest price of all regions/countries for the E0 profile (280,84 kEUR/year) with the others German regions following. Overall, except Germany, only the Netherlands (400 kEUR/year) has the possibility to be under the Belgian average (432 kEUR/year).

In 2023, the competitiveness of Belgium is quite good and on the better side for Flanders, which offers reductions for GC and CHPC. Flanders has the possibility to equal the Netherlands as the second most competitive region (excluding all German regions) if the reduction applies, which is an improvement compared to the average competitive position in 2022. The competitive position of Flanders and Belgium has thus become clearer compared to the E-BSME profile.

If we only consider the maximum ranges of the electro-intensive consumers, Flanders would still be more competitive than France and the Netherlands, but less than the other Herman regions. Compared to last year, it is important to mention that France and the UK deteriorated their competitiveness because of the sharp increase in the commodity component, which more than doubled for them.

Breakdown per component

The previous results are further detailed for profile E0 in the figure underneath, which provides a closer look at the breakdown of the different price components.

Figure 41: Electricity price by component in EUR/MWh (profile E0)

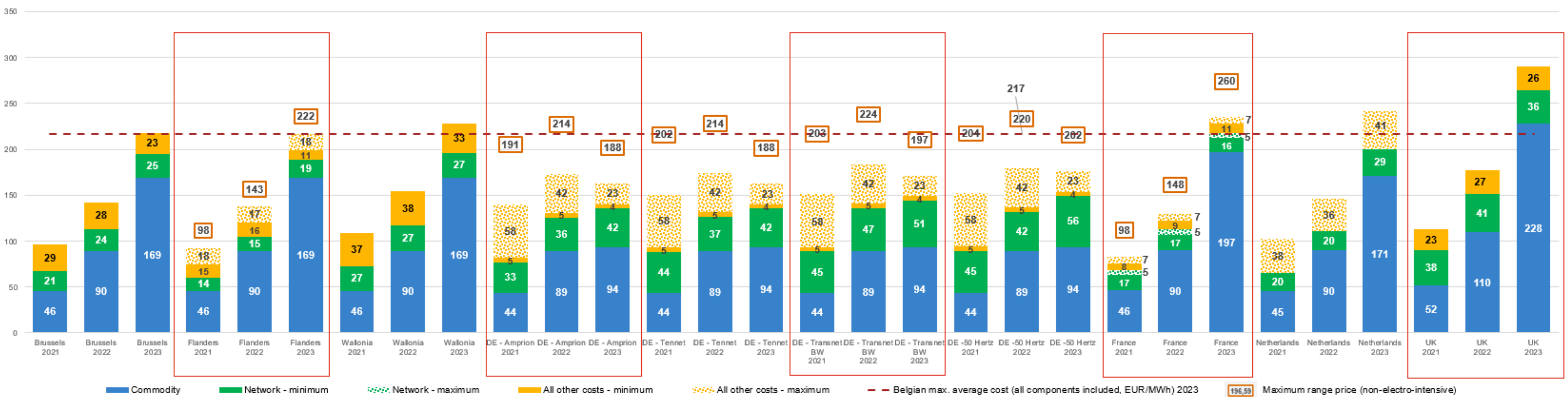
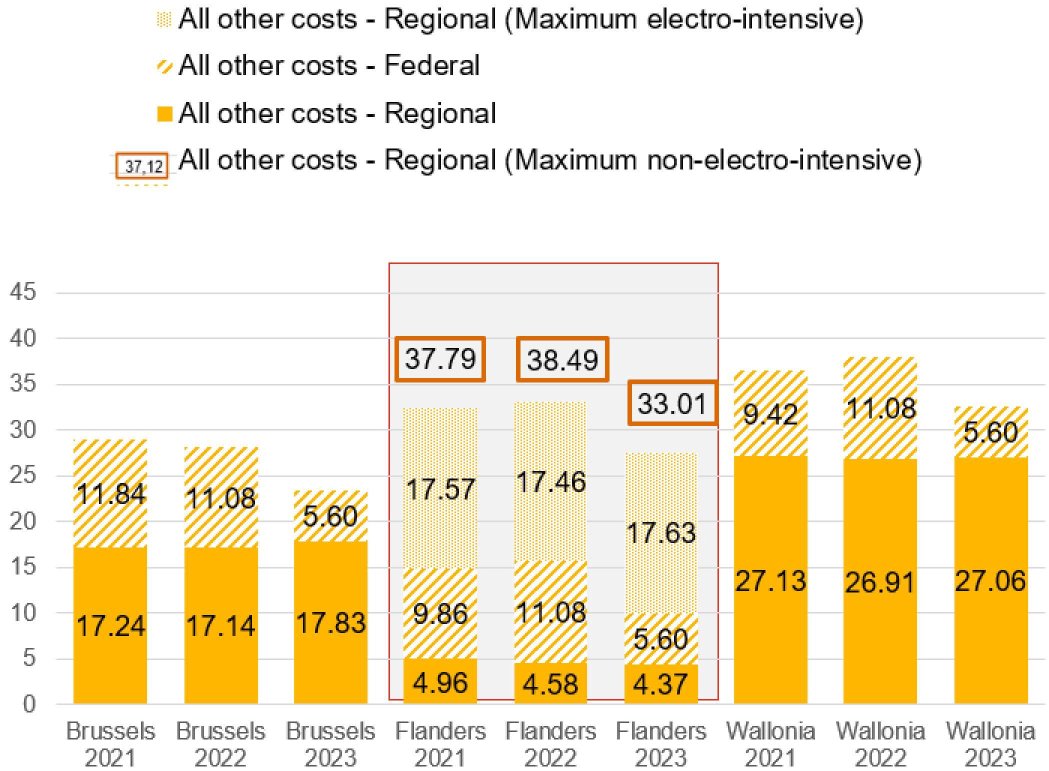


Figure 42: Regional and Federal all other costs in Belgium in EUR/MWh (profile E0)



The **commodity costs component** in Belgium and the Netherlands is similar and sits below France, while the UK has the highest value. The case of Germany is lower than everywhere else due to the price cap set on 70% of the electricity consumption for large consumers. Like the other profiles examined before, also for the E0 profile we observe an increase of the commodity price in all regions/countries compared to the previous years. Even without applying exemptions/reductions, the commodity component accounts for more than half of the total invoice in 2023 for most regions/countries.

The **network costs component** varies across the regions/countries and we see a clear distinction between regions/countries with relatively low network costs, such as Flanders or France, and those with higher network costs, such as some German regions with network costs above 51 EUR/MWh. Like the other profiles previously mentioned, the network costs have slightly increased for most regions/countries under review. However, the relative weight of the network costs over the total invoice has not changed significantly compared to 2022 for the zones analysed. The German region 50 Hertz is the zone with the highest network cost (56 EUR/MWh). In France the network cost depends on the price option (i.e. CU fixed peak, CU mobile peak, LU fixed peak or LU mobile peak), and in all cases, it is the lowest of all regions observed.

Lastly, the **all other costs component**[315] shows the most variation across regions/countries and even in their respective region/country since there are multiple reduction/exemption schemes that affect this component. Except for Brussels, Wallonia and the UK, all the regions/countries present a range, which is the largest in the Netherlands, namely 41 EUR/MWh. This range has decreased in Germany compared to previous year, and this year makes the German regions more competitive than Flanders, Wallonia and the Netherlands when reductions are applied. Even without any reduction applied, Germany remains the most competitive for electro-intensive consumers. For non-electro-intensive, Germany is however not the most competitive anymore.

We also note that the size of the all other costs component and the ranges has remained quite similar to last year, except for Germany where the deletion of the EEG-Umlage and the decrease of the *Konzessionsabgage* diminished the all other costs component. The variations in this component makes the competitive position of the countries less clear and much will depend on which consumers will be entitled to a reduction/exemption. Like previous profiles, the decrease of federal costs in all regions are improving the situation of Belgium regions in relation to their neighbours.

315 This cost includes taxes, levies and certificate schemes.

Impact of Flanders' combined cap on profile E0

The cost of green certificates can have a big impact on the energy price of large industrial consumers. To limit these costs, Flanders introduced two caps, in 2018, on the cost of financing of renewable energies. These caps are proportional to the Gross Value Added (GVA) of the company and thus vary from company to company. Previously this cap was only applicable on GC but since 2021 it is a combined cap that is applicable on GC and CHPC. In the following example, we attempt to illustrate the potential impact of these caps on industrial consumers.

There are two different caps according to the undertaking type of the industrial consumer:[316]

- **Case 1:** Undertakings belonging to sectors listed in annexe 3 or 5 of the EEAG[317] with an electro-intensity above 20%, the amount due for the costs related to the financing of renewable energy and qualitative combined heat and power is capped at 0,50% of the average gross value added (GVA) over the last 3 years;
- **Case 2**: Undertakings belonging to sectors listed in annexe 3 of the EEAG, the amount due for the costs related to the financing of renewable energy and qualitative combined heat and power is capped at 4% of the average gross value added (GVA) over the last 3 years.

Since the cap's financial impact differs according to the last 3 years' average gross value added, it also differs between companies. Therefore, this analysis focuses on identifying the maximum GVA from which each profile (E0 to E4) no longer benefits from the caps (i.e. a reduction in the total cost of GC and CHPC). The computation of GC and CHPC is explained in Section 5.

The results for E0[318] are synthesised in the following table:

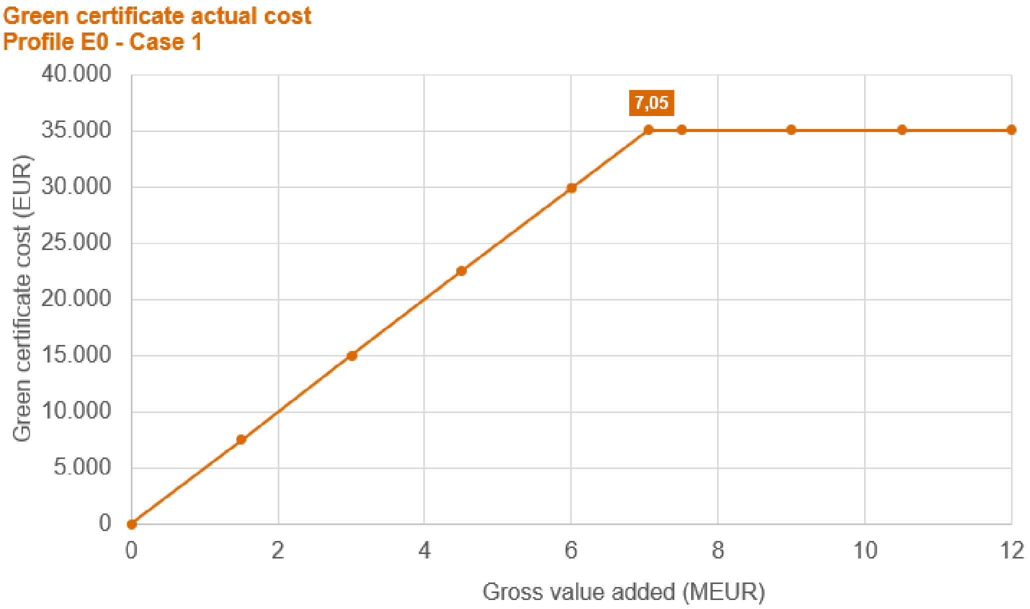
Table 123: Flanders' cap on profile E0

	Case 1	Case 2
NACE codes[319]	Annexe 3 or 5 EEAG	Annexe 3 EEAG
Electro-intensity	> 20%	No threshold
Cap (% of GVA)	0,50%	4%
Average yearly consumption (E1)	2 GWh	
Scheme cost (without cap)	35.264,07 EUR	
Maximum gross value added to benefit from the cap	7,05 MEUR	881,60 kEUR

[316] The companies listed in Annexe 3 and 5 of EEAG correspond to the companies listed in the Energiedecreet except for Nace 3832 (Recycling of waste) which is listed in Annexe 3 EEAG but not in the Energiedecreet.
[317] (European Commission, 2014-2020)
[318] One must be aware that it is less likely that E0-like consumers would fall under the cap application scheme. However, for the sake of the report consistency and the latter analyses, we reflect potential impacts it would have on this consumer.
[319] The companies listed in Annexe 3 and 5 of EEAG correspond to the companies listed in the Energiedecreet except for Nace 3832 (Recycling of waste) which is listed in Annexe 3 EEAG but not in the Energiedecreet.

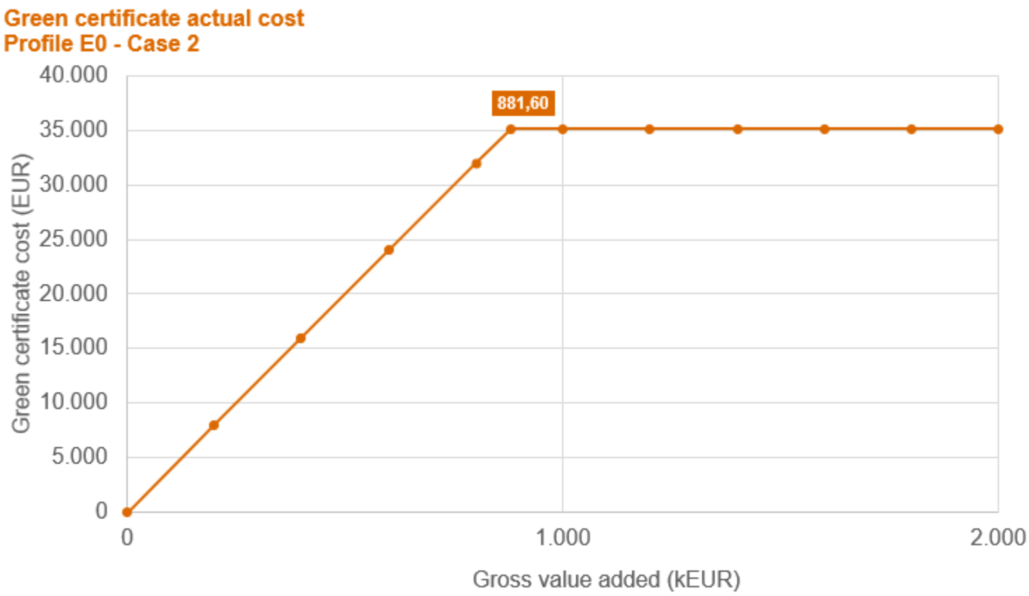
Considering only Profile E0 companies with NACE codes from Annexe 3 or 5 from the EEAG and with an electro-intensity above 20% (case 1), a company benefits from the application of the cap as long as its gross value added is less than 7.052.813 EUR.

Figure 43: CHPC and GC actual cost for E0 profile (Case 1)



Considering only Profile E0 companies with NACE codes from Annexe 3 from the EEAG (case 2), a company benefits from the application of the cap as long as its gross value added is less than 881.602 EUR.

Figure 44: Green certificate actual cost for E0 profile (Case 2)



KEY FINDINGS

The analysis of the E0 profile leads us to the following findings:

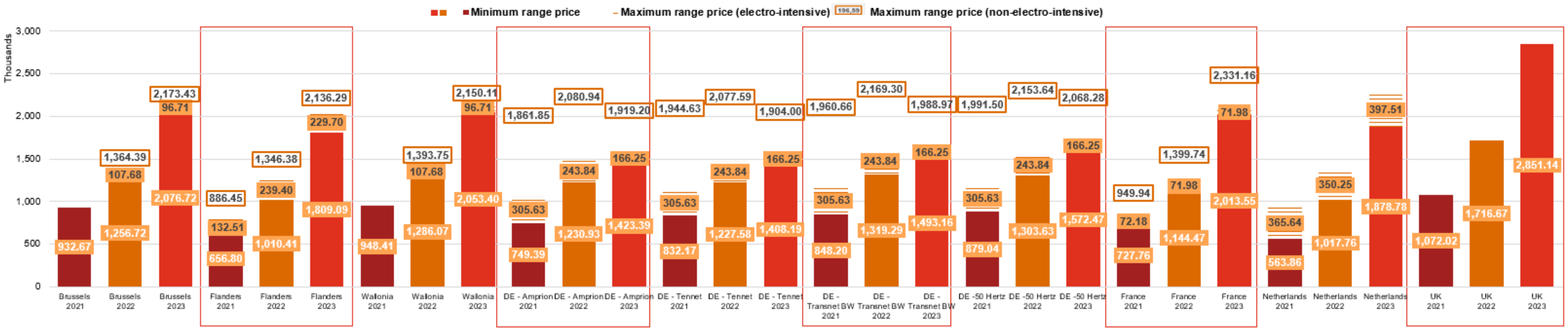
- The **competitiveness of the regions/countries is no longer as clear cut as it was for the smaller profiles**. For example, the Netherlands can be below the Belgian average when reductions do apply but is above if not. We observe differences between regions/countries in terms of total electricity bill for this profile, especially when electro-intensity can be applied. The UK is an outlier in this case because there are no exemptions/reductions there, thus making it the most expensive zone when reductions are applied in the other regions/countries. On the other hand, Germany is the most competitive country this year due to the capping mechanism in place.
- **Flanders is still in a good competitive position thanks to the GC and CHPC reduction schemes**, at the same level of Brussels and with Wallonia's position staying stable in the overall picture. Germany has, reductions applied or not, the lowest total invoice of all regions/countries.
- The **commodity component** plays a bigger role than previous years due to the increase observed in 2022 and even makes up more than 80% of the total invoice in some cases. This component is very similar among regions (exclusion of Germany), with the UK being more expensive.
- The most expensive **network cost** is found in the German 50 Hertz region (56 EUR/MWh) and the cheapest in Flanders (19 EUR/MWh) if reduction don't apply. The network cost in Flanders is still the lowest of the country, while the other two regions are on a relatively similar level and likewise, are among the most competitive regions in 2023. This shows that the new tariff structure in Flanders does not impact its competitiveness.
- In Belgium, Wallonia now has the highest **all other costs component,** and Flanders has the potential to have the smallest because of the potential GC and CHPC reduction for larger consumers. This component has the biggest impact on the competitiveness and the positioning of all the regions/countries. In the Netherlands, reductions make a big change, up to 41 EUR/MWh less for electro-intensive consumers.

Profile E1 (Electricity)

Total invoice analysis

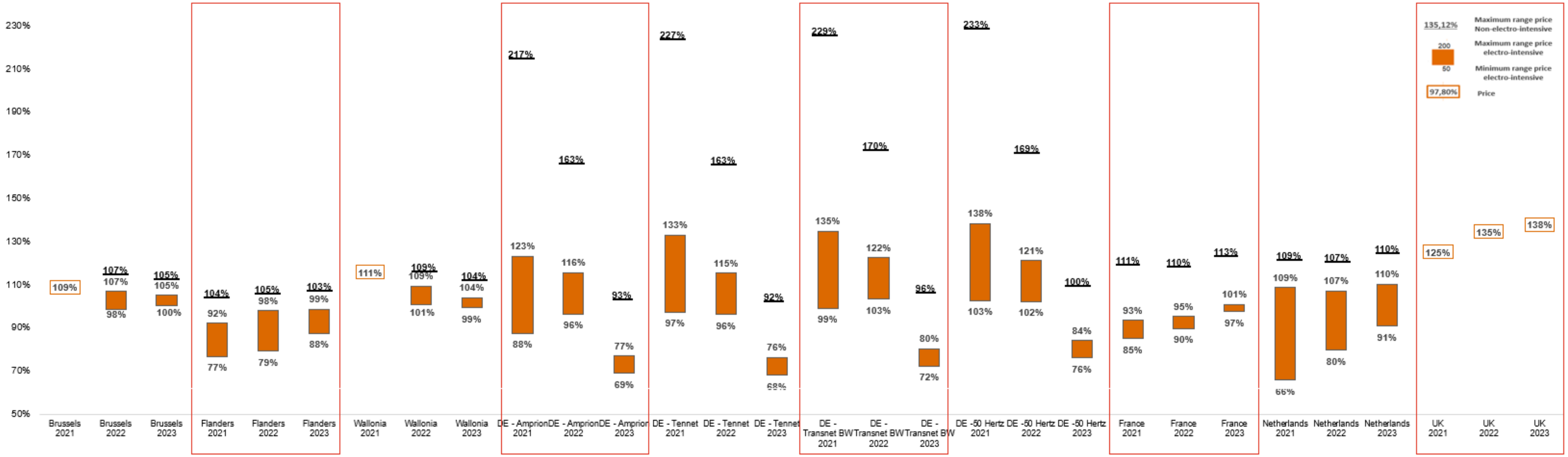
The first figure below provides a comparison of the total yearly invoice paid by an industrial profile E1 in the different studied regions and countries. The results are expressed in kEUR/year.

Figure 45: Total yearly invoice in kEUR/year (profile E1)



In next page's figure, we compare each region and country's yearly bill with the average Belgian price, which is set at 100. The Belgian average is computed as the mean between Brussels', Wallonia's and Flanders' minimum and maximum prices.

Figure 46: Total yearly invoice comparison in % (profile E1; Belgium Average 2023 = 100)



As depicted in the previous page, the total invoice has increased in all the regions/countries under review. We have once again big ranges to consider, but like E0, the UK does not have price ranges. In 2023, we show a range of prices also for Brussels and Wallonia for profiles from E1 to E4, because of the exemption to the special excise duty that these profiles could receive[320]. After Germany and all its regions, Flanders has the potential to have the lowest bill (1.809,09 kEUR/year) followed by the Netherlands (1.878,78 kEUR/year).

Compared to Belgium the competitive position of Germany is improving compared to previous years due to the relative decrease in commodity prices and the lower all other costs ranges. Even when reductions/exemptions are applied, the German regions are the least expensive. When all reductions are applied, Flanders is the second cheapest zone, followed by the Netherlands and France. It is again important to note that the UK is the most expensive country.

The difference between electro- and non-electro intensive consumers is also important to note, and it affects the competitiveness of all regions/countries in scope of this study.

[320] According to Art. 429.§ 1er of the law from 27th December 2004[320] an exemption is foreseen when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures, thus being considered as “double usage

Breakdown per component

The previous results are further detailed for profile E1 in the figure underneath, which provides a closer look at the breakdown of the different price components.

Figure 47: Electricity price by component in EUR/MWh (profile E1)

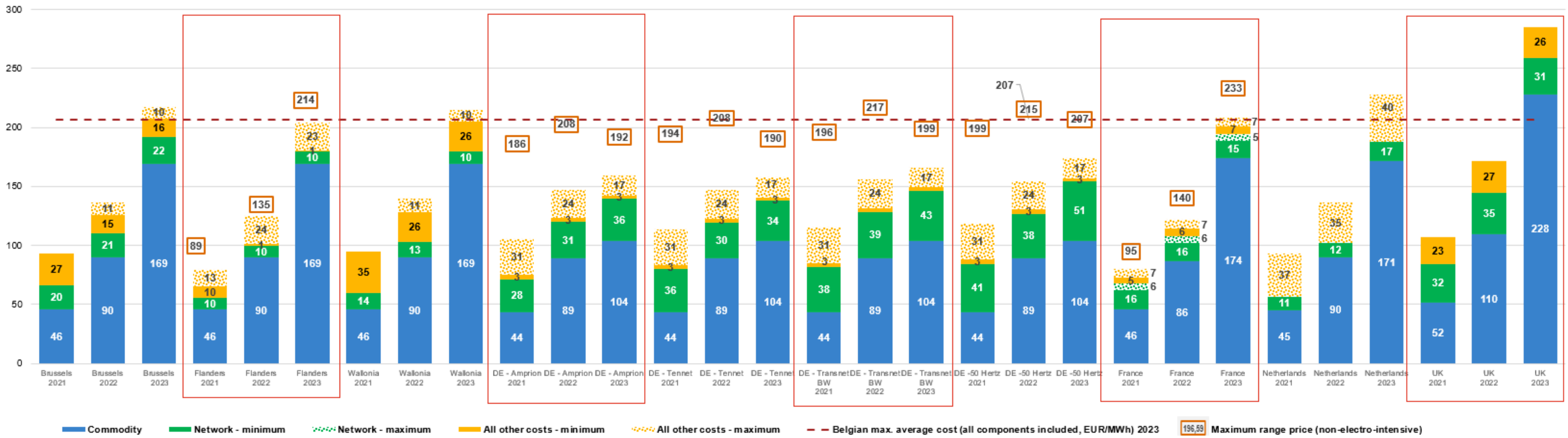
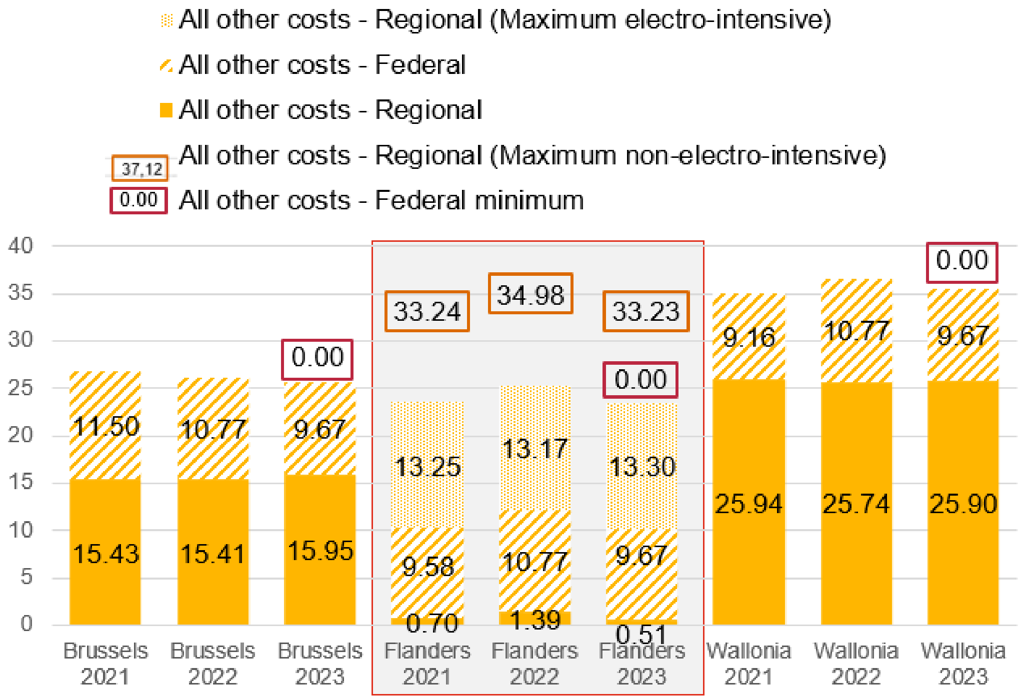


Figure 48: Regional and Federal all other costs in Belgium in EUR/MWh (profile E1)



Like E-BSME and E0, the **commodity component** increases for all regions/countries and does not vary much across Belgium, France and the Netherlands, all around 170 EUR/MWh. The UK is more expensive (228 EUR/MWh) while Germany is the cheapest due to its capping mechanism (104 EUR/MWh).

The importance of the **network cost** is steadily decreasing as the profiles become larger and larger but is still significant in Germany and the UK. Flanders has the lowest network cost (10 EUR/MWh) followed by Wallonia (10 EUR/MWh), even when no reductions are applied. For most of the regions we observe a slight increase in network costs, except in the UK, but this is not significant in affecting the competitiveness of the different zones under review.

The **all other costs component**[321] shows a lot of variation across regions/countries. The range in Germany has decreased compared to previous year, the range is now 17 EUR/MWh, while 24 EUR/MWh the previous year. This implies that there is less difference between electro intensive and non-electro intensive consumers due to the deletion of the *EEG Umlage* tax and the reduction of the *Konzessionsabgabe*. In the Netherlands there is still a possible full exemption of the all other costs component. The qualification as electro-intensive consumer is still very important in Germany and France. The UK still do not offer any reductions. In Belgium, the application of the federal excise duty and its possible exemption for industrial profiles (E1-E4)[322], allows to reduce to 0 the federal costs for the profiles (E1 to E4) when the full exemption is applied.

[321] This cost includes taxes, levies and certificate schemes.

[322] According to Art. 429.§ 1er of the law from 27th December 2004[322]. In fact, an exemption is foreseen when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures, thus being considered as “double usage”.

Impact of Flanders' combined cap on profile E1

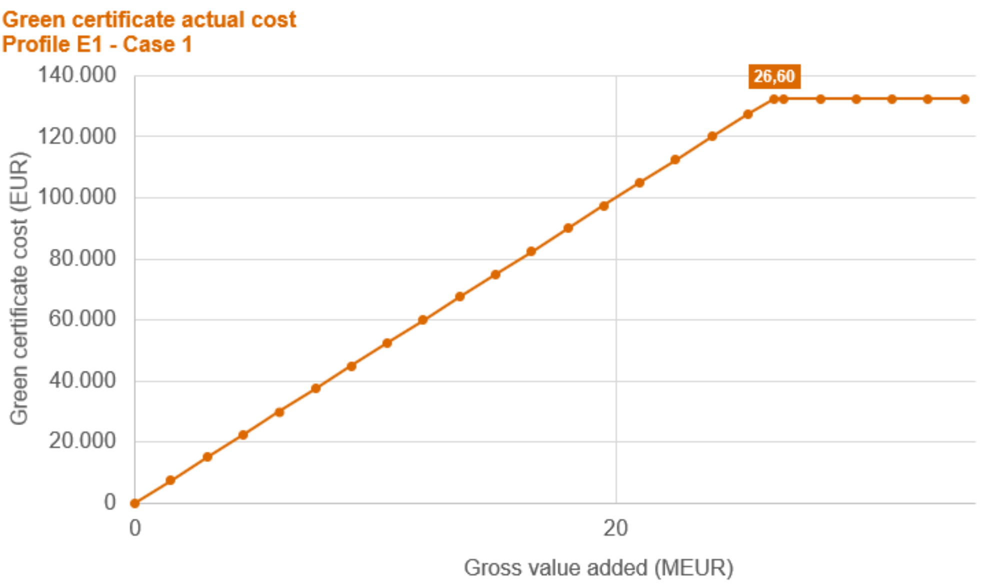
The cost of green certificates can have a big impact on the energy price of large industrial consumers. To limit these costs, Flanders introduced two caps, in 2018, on the cost of financing of renewable energies. These caps are proportional to the Gross Value Added (GVA) of the company and thus vary from company to company. In the following example, we attempt to illustrate the potential impact of these caps on industrial consumers. Previously this cap was only applicable on GC but since 2021 it is a combined cap that is applicable on GC and CHPC.

Table 124: Flanders' cap on profile E1

	Case 1	Case 2
NACE codes[323]	Annexe 3 or 5 EEAG[324]	Annexe 3 EEAG
Electro-intensity	> 20%	No threshold
Cap (% of GVA)	0,50%	4%
Average yearly consumption (E1)	10 GWh	
Scheme cost (without cap)	132.989,33 EUR	
Maximum gross value added to benefit from the cap	26,59 MEUR	3,32 MEUR

Considering only Profile E1 companies with NACE codes from Annexe 3 or 5 from the EEAG and with an electro-intensity above 20% (case 1), a company benefits from the application of the cap as long as its gross value added is less than 26.597.865 EUR.

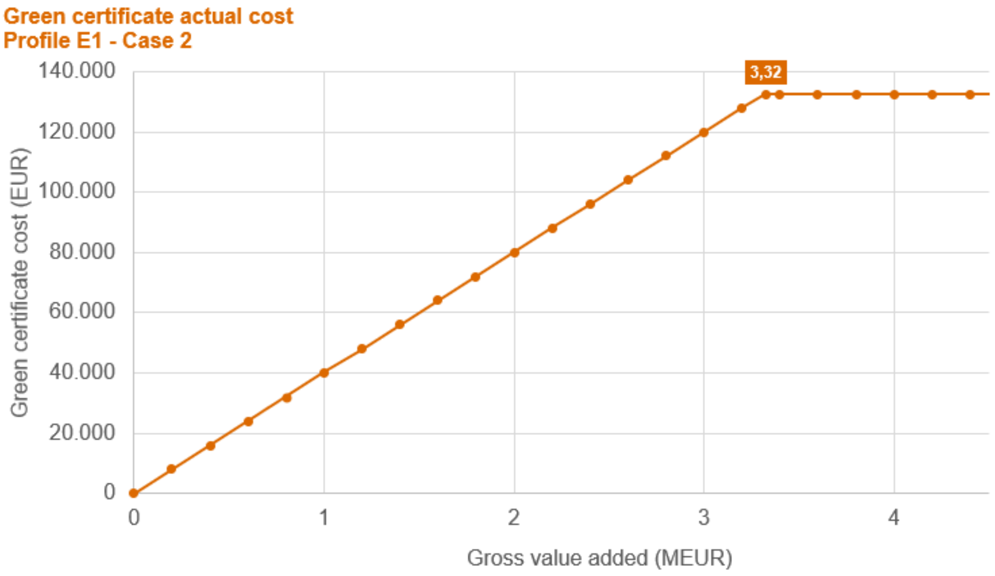
Figure 49: CHPC and GC actual cost for E1 profile (Case 1)



[323] The companies listed in Annexe 3 and 5 of EEAG correspond to the companies listed in the Energiedecreet except for Nace 3832 (Recycling of waste) which is listed in Annexe 3 EEAG but not in the Energiedecreet.
[324] (European Commission, 2014-2020)

Considering only Profile E1 companies with NACE codes from Annexe 3 from the EEAG (case 2), a company benefits from the application of the cap as long as its gross value added is less than 3.324.733 EUR.

Figure 50: CHPC and GC actual cost for E1 profile (Case 2)



KEY FINDINGS

The analysis of the E1 profile leads us to the following findings:

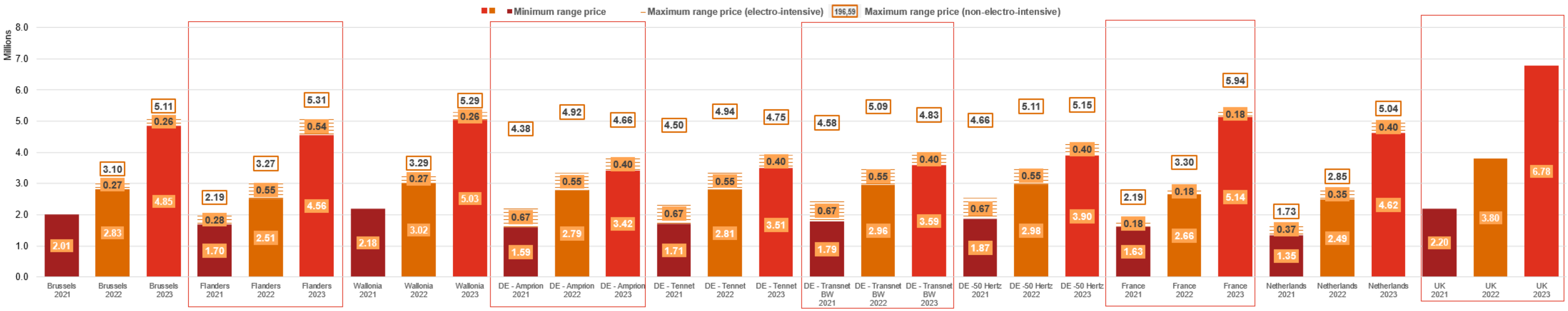
- Not taking the costs for non-electro-intensive consumers into account we still have a big range between the cheapest and most expensive region/country under review, namely between 1.408,19 kEUR (Tennet Germany) and 2.851,14 kEUR (the UK). The most expensive country, taking non-electro-intensive consumers into account, is also the UK.
- **In Belgium, Flanders is the most competitive region in 2023** whether reductions/exemptions are considered or not. This can be explained by lower network costs and the potential to have a significantly reduced all other costs component compared to the two other Belgian regions.
- The **commodity component** does not change significantly between profiles and is quite similar across the reviewed regions/countries with the UK being the most expensive with 228 EUR/MWh. All countries see a similar sharp increase in commodity cost, except Germany which is under a price cap measure set by the government, and for which the commodity cost appears therefore diminished.
- Flanders has the most competitive **network cost** (10 EUR/MWh), its competitive position being not impacted by the new tariff structure. The other Belgian regions, France and the Netherlands are in the middle average group regarding the competitiveness on this component while Germany and the UK are clearly the most expensive countries regarding this component. France has a range (7 EUR/MWh) for the network costs but remains in the middle group either way.
- Lastly the component that varies the most among countries is the **all other costs**. This can have an impact on the competitiveness of the regions/countries, even if it is less impactful than previous years because of the general increase of the commodity component. No matter what, consumers in Germany pay the lowest bill, while the UK becomes the most expensive in all situations. For the E1 profile the Netherlands displays the biggest range for electro-intensive consumers (40 EUR/MWh). Since the all other costs in France are very small to begin with, even if the reduction for electro-intensive consumers does not apply, they are in a middle-range competitive position, at a similar level than Flanders and above Germany.

Profile E2 (Electricity)

Total invoice analysis

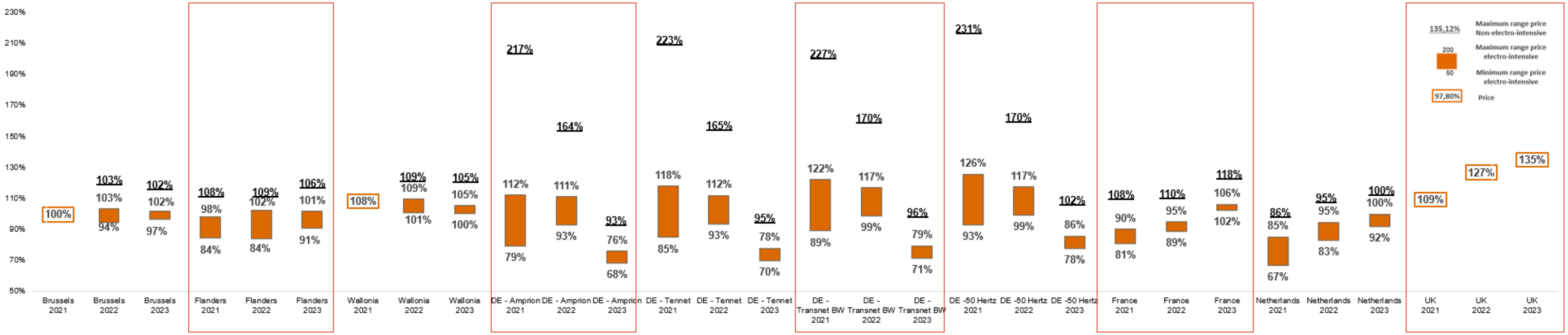
The figure below provides a comparison of the total yearly invoice paid by an industrial profile E2 in the different studied countries and regions. The results are expressed in MEUR/year. The second figure gives the Belgian average of 100% to easily compare the percentual price differences with other countries.

Figure 51: Total yearly invoice in MEUR/year (profile E2)



Below, we compare each region and country's yearly bill with the average Belgian price, which is set at 100. The Belgian average is computed as the mean between Brussels', Wallonia's and Flanders' minimum and maximum prices.

Figure 52: Total yearly invoice comparison in % (profile E2; Belgium Average 2023 = 100)



Before starting the analysis, we note that the price has increased in all the reviewed countries. This is because of a higher commodity component in 2023, similarly to what has been observed for the previous profiles.

Regarding the E2 profiles, we notice that Germany is the most competitive country for both electro intensive consumers and non-electro intensive ones due to its capping mechanism, together with a couple of all other costs measures being alleviated or cancelled. The UK becomes this year the least competitive country due to a very high commodity cost component.

Flanders has the second cheapest invoice after Germany, followed by the Netherlands when looking at electro-intensive consumers. All in all, the increase in commodity prices has led Belgium and the Netherlands to converge, below the prices observed in France. The UK has the most expensive total invoice this year for E2 profile, regardless of whether we are talking about electro-intensive consumers or non electro-intensive consumers.

Breakdown per component

The previous results are further detailed for profile E2 in the underneath figure, which provides a closer look at the breakdown of the different price components.

Figure 53: Electricity price by component in EUR/MWh (profile E2)

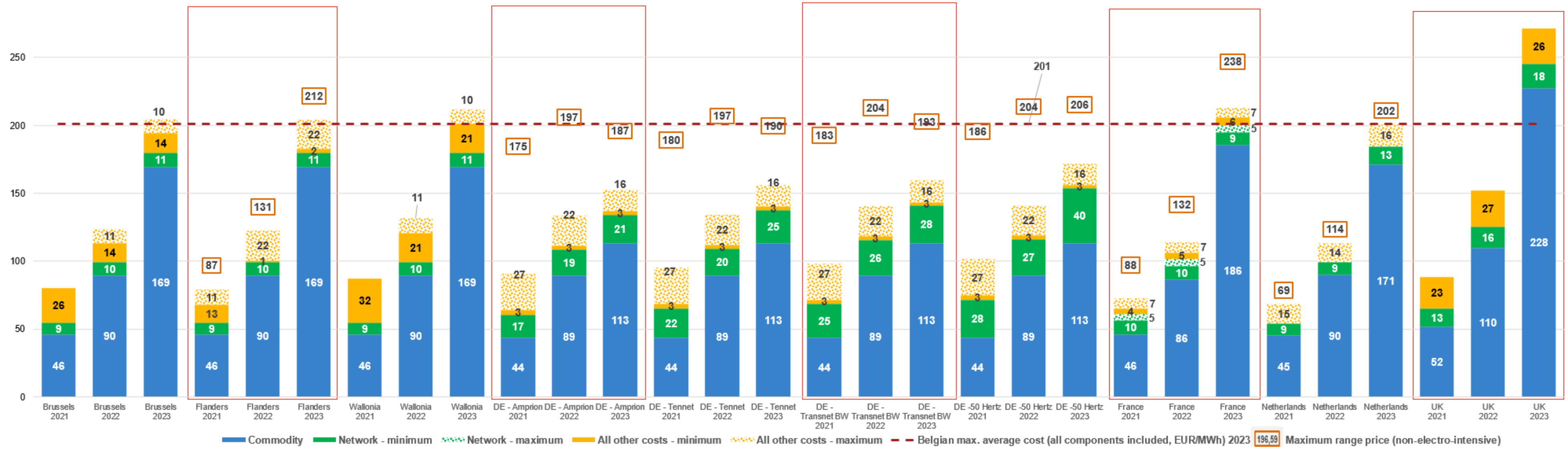
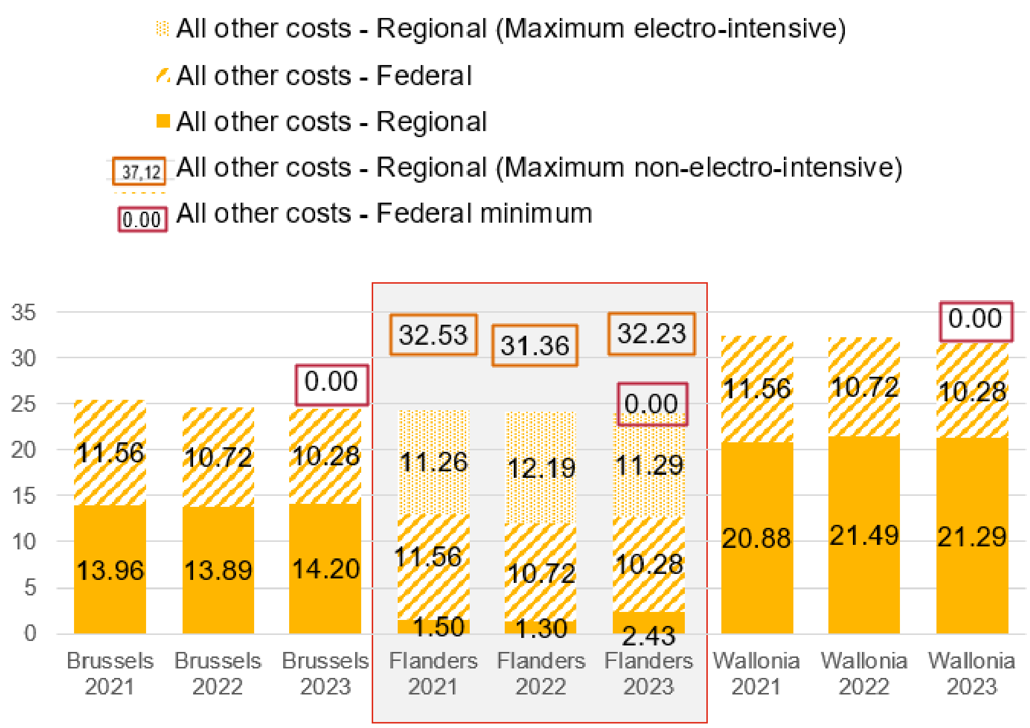


Figure 54: Regional and Federal all other costs in Belgium in EUR/MWh (profile E2)



The **commodity component** is similar between Belgium and the Netherlands (around 170 EUR/MWh). France is slightly more expensive (186 EUR/MWh), with the UK being the most expensive country (228 EUR/MWh). Once again, Germany is the less expensive country due to the capping mechanism in place.

The **network costs component** are the lowest in France, closely followed by Belgium and the Netherlands. Since the E2 profile is no longer connected to the distribution grid, this cost is the same in all the Belgian regions. For Belgium, given the fact that the transmission tariffs approved by the CREG are (almost) stable over the 2020-2023 period, the increase in the network costs component observed between 2022 and 2023 is a direct consequence of the increase in the commodity cost and the network losses percentage fixed by the TSO. Indeed, the costs of network losses on the federal transmission grid (380/220/150 kV) are, for the purpose of this study, considered as a component of network costs and suppliers usually bill these costs as a percentage (fixed every year by the TSO) of the commodity cost. The UK, and Germany to an even greater extent, do apply higher network costs.

Finally, the **all other costs component**[325] varies greatly depending on the region/country and on the consumer profile (electro-intensive or not). Depending on the consumer they might be entitled to a reduction or even an exemption. In the Netherlands we do see that there is a maximum for non-electro-intensive consumers to consider, while it was not the case for the other industrial profiles analysed so far (E0 and E1). In the UK where there are still no reductions/exemptions to be applied for electro-intensive consumers, while for Brussels and Wallonia we see since 2022 that a range is available due to the possible exemption on the special excise duty for profiles E1 to E4. Depending on the reduction in the Netherlands, it might be more competitive than France and Flanders, the most competitive Belgian region. While France will in any case at least bill 6 EUR/MWh to their consumers this is not the case in the Netherlands which puts France at a disadvantage regarding this component.[326]

[325] This cost includes taxes, levies and certificate schemes.

[326] In addition to the degressivity rules and limits that apply the larger profiles (E2 and higher) do not pay a part of the all other costs, namely the part billed through the DSO, which the smaller profiles do pay.

Impact of Flanders' combined cap on profile E2

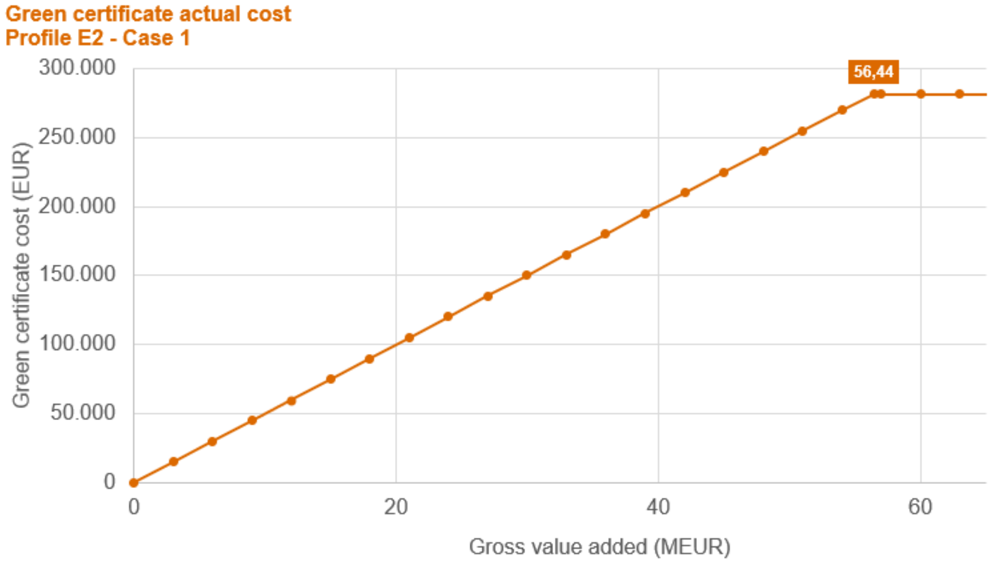
The cost of green certificates can have a big impact on the energy price of large industrial consumers. To limit these costs, Flanders introduced two caps, in 2018, on the cost of financing of renewable energies. These caps are proportional to the Gross Value Added (GVA) of the company and thus vary from company to company. In the following example, we attempt to illustrate the potential impact of these caps on industrial consumers. Previously this cap was only applicable on GC but since 2021 it is a combined cap that is applicable on GC and CHPC.

Table 125: Flanders' cap on profile E2

	Case 1	Case 2
NACE codes[327]	Annexe 3 or 5 EEAG[328]	Annexe 3 EEAG
Electro-intensity	> 20%	No threshold
Cap (% of GVA)	0,50%	4%
Average yearly consumption (E2)	25 GWh	
Scheme cost (without cap)	282.222,95 EUR	
Maximum gross value added to benefit from the cap	56,44 MEUR	7,06 MEUR

Considering only Profile E2 companies with NACE codes from Annexe 3 or 5 from the EEAG and with an electro-intensity above 20% (case 1), a company benefits from the application of the cap as long as its gross value added is less than 56.444.590 EUR.

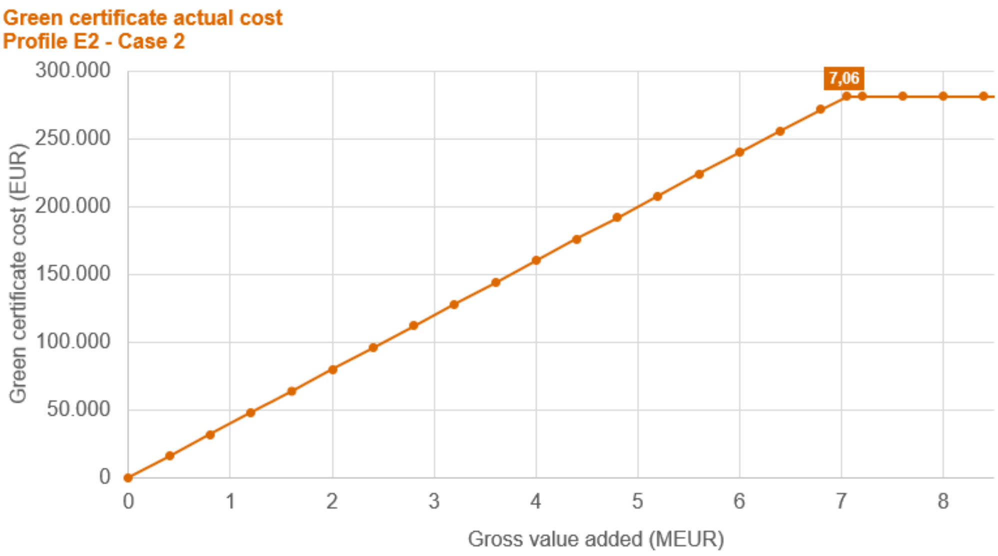
Figure 55: CHPC and GC actual cost for E2 profile (Case 1)



Considering only Profile E2 companies with NACE codes from Annexe 3 from the EEAG (case 2), a company benefits from the application of the cap as long as its gross value added is less than 7.055.574 EUR.

[327] The companies listed in Annexe 3 and 5 of EEAG correspond to the companies listed in the Energiedecreet except for Nace 3832 (Recycling of waste) which is listed in Annexe 3 EEAG but not in the Energiedecreet.
[328] (European Commission, 2014-2020)

Figure 56: CHPC and GC actual cost for E2 profile (Case 2)



KEY FINDINGS

The analysis of the E2 profile leads us to the following findings:

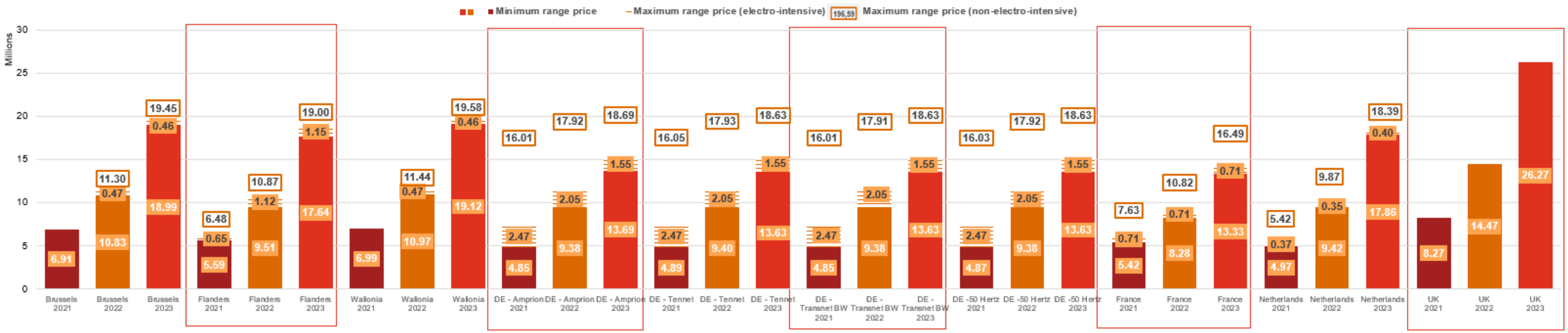
- The total invoices increased in all regions/countries under review and varies between 3,42 MEUR (minimum range in Germany Amprion) and 6,78 MEUR (the UK) when we do not take the non-electro-intensive consumers into account. The UK also have the highest possible bill for the non-electro-intensive consumers with 6,78 MEUR, as they do not make a difference based on electro-intensity.
- **In Belgium, Flanders is the most competitive regions** for electro-intensive consumers thanks to the reductions on the all other costs, while Germany Amprion is the cheapest among all the regions/countries under review. Since the E2 profile is no longer connected to the distribution grid the network cost has decreased and is now the same across all Belgian regions. However, Flanders loses its competitive advantage inside Belgium for non-electro intensive consumers, as the other regions provide more attractive tariffs in 2023.
- The **commodity component** stays the same as the smaller profiles (until E-BSME) and it also represents for the E2 profile the largest share of the invoice bill in 2023, accounting for even more than 60% in most regions.
- Compared to last year, we notice a general slight increase of the **network cost** components in all regions/countries, and more important in the German regions of Tennet and 50 Hertz. The network cost is still significant in Germany and generally higher than the other regions/countries.
- The **all other cost component** still plays an important role in determining the competitiveness of the regions. Several regions/countries such as France, the Netherlands, Germany and Flanders support electro-intensive consumers by offering fares reductions. Not falling under these reductions will significantly increase the costs. The possibility to be completely exempted from the federal excise duty in Belgium can truly help the competitiveness position of the three Belgian regions, especially compared to the Netherlands and France.

Profile E3 (Electricity)

Total invoice analysis

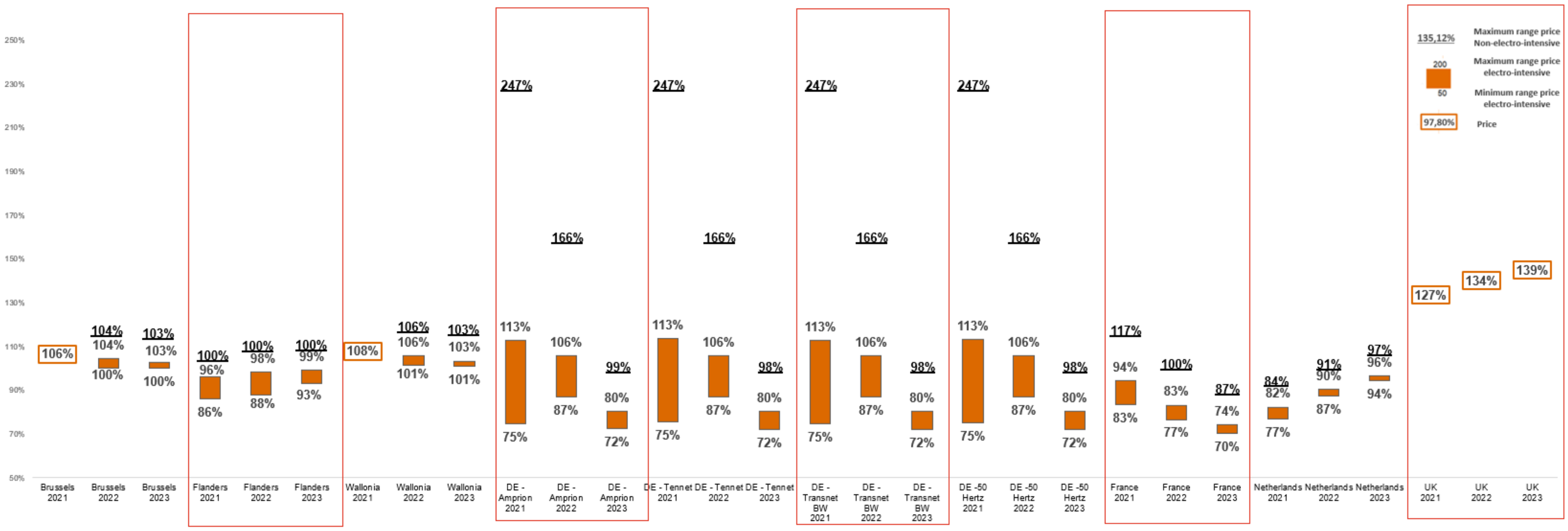
The figure below provides a comparison of the total yearly invoice paid by an industrial profile E3 in the different studied regions and countries. The results are expressed in MEUR/year.

Figure 57: Total yearly invoice in MEUR/year (profile E3)



In next page's figure, we compare each region and country's yearly bill with the average Belgian price, which is set at 100. The Belgian average is computed as the mean between Brussels', Wallonia's and Flanders' minimum and maximum prices.

Figure 58: Total yearly invoice comparison in % (profile E3; Belgium Average 2023 = 100)



The total invoice has increased in all regions/countries under review. The position of the UK reflects the same trend observed for E1 and E2. It is still the most expensive country. Furthermore, it is important to note that Flanders is the most competitive Belgian region, though with very low differences to the other Belgian regions, even without taking reductions into account. Looking at all the regions/countries, only Germany and France have the possibility to be the cheapest region for electro-intensive consumers under the right circumstances, with France being in most scenarios the cheapest one. The Netherlands will in all cases be cheaper than any Belgian region but remains in any case less competitive than France and (only for electro intensive customers) all German regions, due to a lower commodity price in those countries. Comparatively to previous years, the Belgian competitive position is becoming weaker the larger the consumers become.

Breakdown per component

The previous results are further detailed for profile E3 in the figure underneath, which provides a closer look at the breakdown of the different price components.

Figure 59: Electricity price by component in EUR/MWh (profile E3)

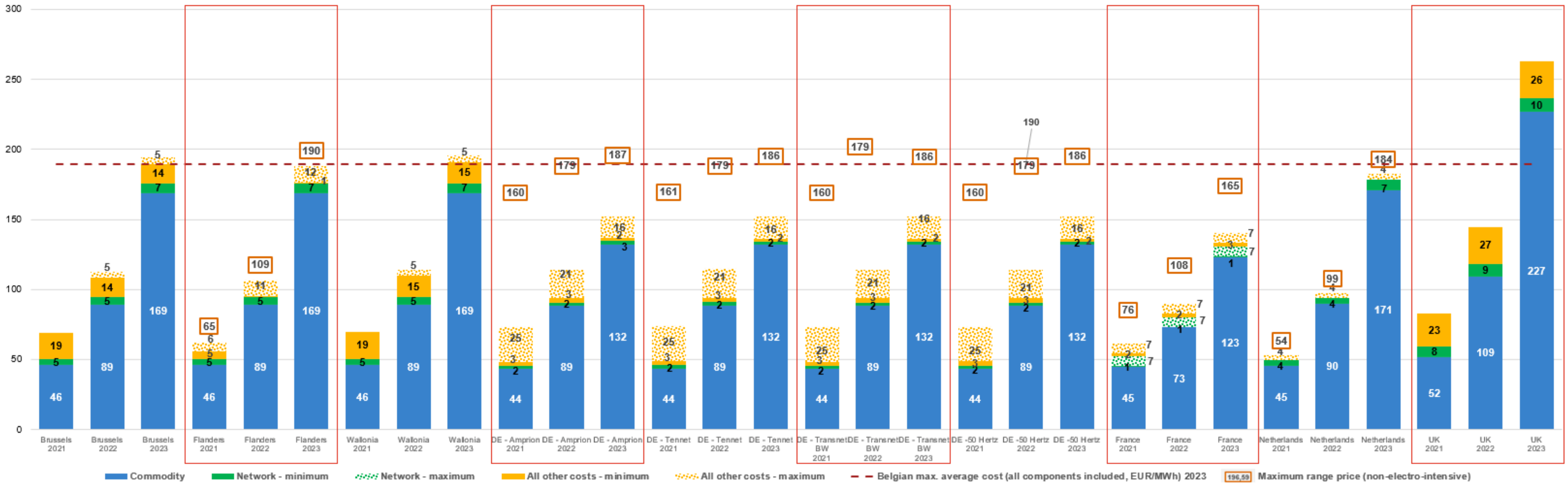
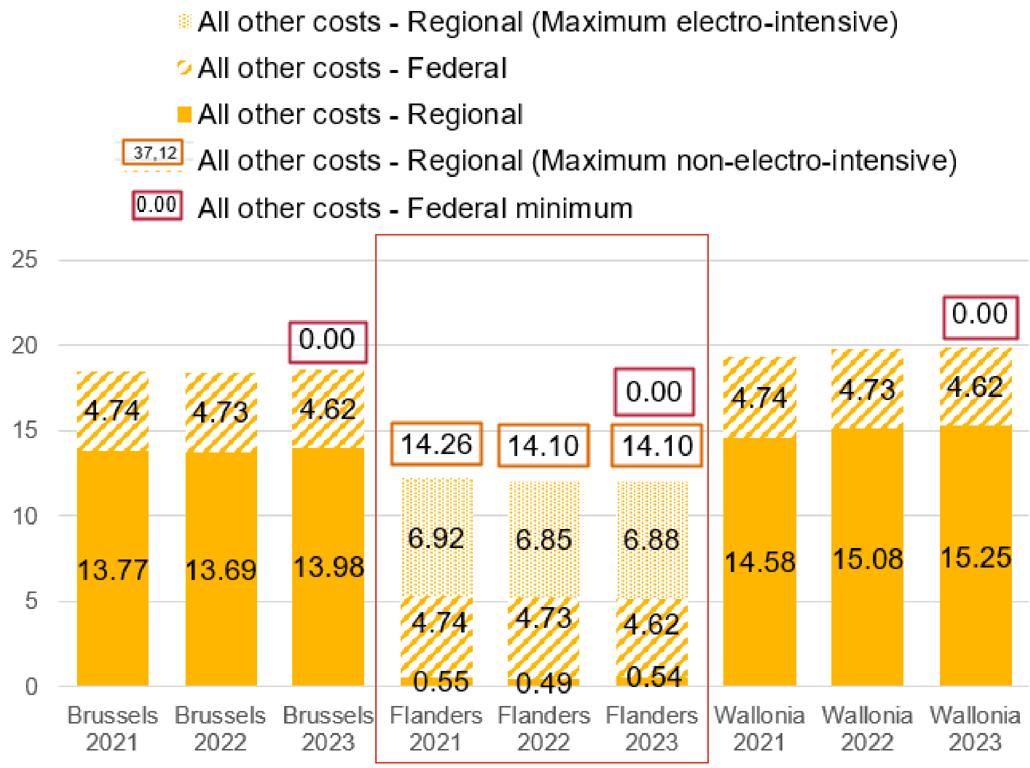


Figure 60: Regional and Federal all other costs in Belgium in EUR/MWh (profile E3)



In comparison to previous consumer profiles, the **commodity component** of consumer E3 differs as we assume that it constantly operates (24/24, 7/7). Consequently, commodity costs slightly differ compared to previous consumption profiles. Globally, a similar situation is encountered across regions/countries with the lowest cost in France followed by Germany. The commodity price for E3 profiles in France is lower than for the previous industrial profiles due to the ARENH mechanism (explained in detail in chapter 5). This explains why France is even more competitive than other regions/countries for this profile. On the other hand, the UK has the most expensive commodity cost (227 EUR/MWh). Like the other profiles, we observe that also for E3, the commodity component now accounts for most of the electricity bill.

The **network cost component** does not have a big impact on the total invoice and, as said for profile E2, these are now lower and harmonised in Belgium since they are directly connected to the transmission grid and no regional differences must be considered for this profile. The UK still has the highest network cost, 10 EUR/MWh. The low cost of this component for the E3 profile is due to varying reductions on transmission costs in several of the regions/countries under review, which greatly affects the countries' competitiveness. For most of the regions/countries under review we notice an increase of the network costs in 2023 compared to 2022, but the increase is minimal and not that significant on the total bill. For Belgium, given the fact that the transmission tariffs approved by the CREG are (almost) stable over the 2020-2023 period, the increase in the network costs component observed between 2022 and 2023 is a direct consequence of the increase in the commodity cost and the network losses percentage fixed by the TSO. Indeed, the costs of network losses on the federal transmission grid (380/220/150 kV) are, for the purpose of this study, considered as a component of network costs and suppliers usually bill these costs as a percentage (fixed every year by the TSO) of the commodity cost.

The minimum rate of the **all other costs component**[329] becomes smaller and smaller and is still significant in Brussels (14 EUR/MWh), Wallonia (15 EUR/MWh) and the UK (26 EUR/MWh). In the Netherlands, important reductions are granted on taxes paid for consumption above 10 GWh, which makes it the country with the potentially lowest possible tax level together with France. Nonetheless, electro-intensive consumers do not see the European minimum tax level (0,50 EUR/MWh) yet applied at their consumption level since the reduction through the "Teruggaaf over energiebelasting en ODE" in the Netherlands is higher.[330]

Impact of Flanders' combined cap on profile E3

The cost of green certificates can have a big impact on the energy price of large industrial consumers. To limit these costs, Flanders introduced two caps, in 2018, on the cost of financing of renewable energies. These caps are proportional to the Gross Value Added (GVA) of the company and thus vary from company to company. In the following example, we attempt to illustrate the potential impact of these caps on industrial consumers. Previously this cap was only applicable on GC but since 2021 it is a combined cap that is applicable on GC and CHPC.

Table 126: Flanders' cap on profile E3

	Case 1	Case 2
NACE codes[331]	Annexe 3 or 5 EEAG[332]	Annexe 3 EEAG
Electro-intensity	> 20%	No threshold
Cap (% of GVA)	0,50%	4%
Average yearly consumption (E3)	100 GWh	
Scheme cost (without cap)	688.378,70 EUR	
Maximum gross value added to benefit from the cap	137,68 MEUR	17,21 MEUR

Considering only Profile E3 companies with NACE codes from Annexe 3 or 5 from the EEAG and with an electro-intensity above 20% (case 1), a company benefits from the application of the cap as long as its gross value added is less than 137.675.740 EUR.

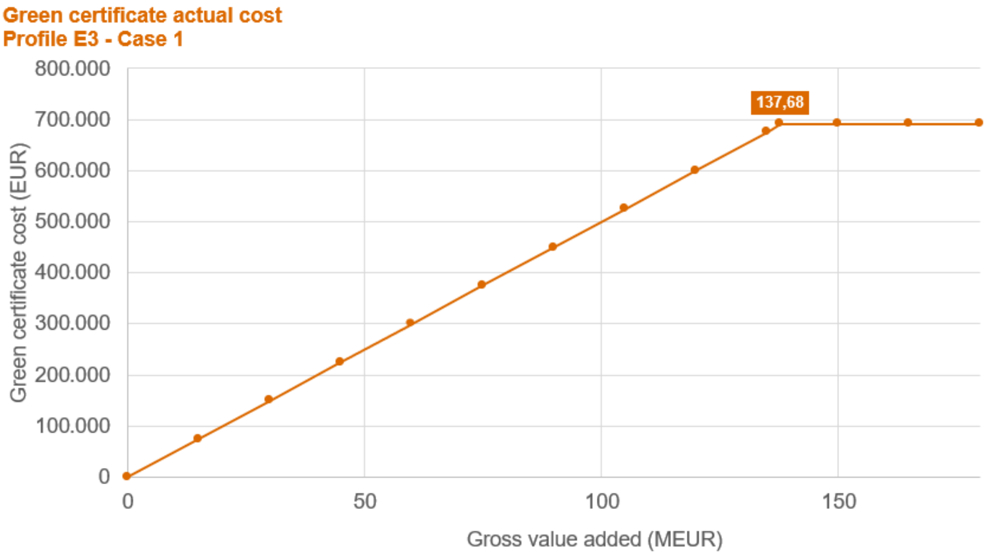
[329] This cost includes taxes, levies and certificate schemes.

[330] In addition to the degressivity rules and limits that apply the larger profiles (E2 and higher) do not pay a part of the all other costs, namely the part billed through the DSO, which the smaller profiles do pay.

[331] The companies listed in Annexe 3 and 5 of EEAG correspond to the companies listed in the Energiedecreet except for Nace 3832 (Recycling of waste) which is listed in Annexe 3 EEAG but not in the Energiedecreet.

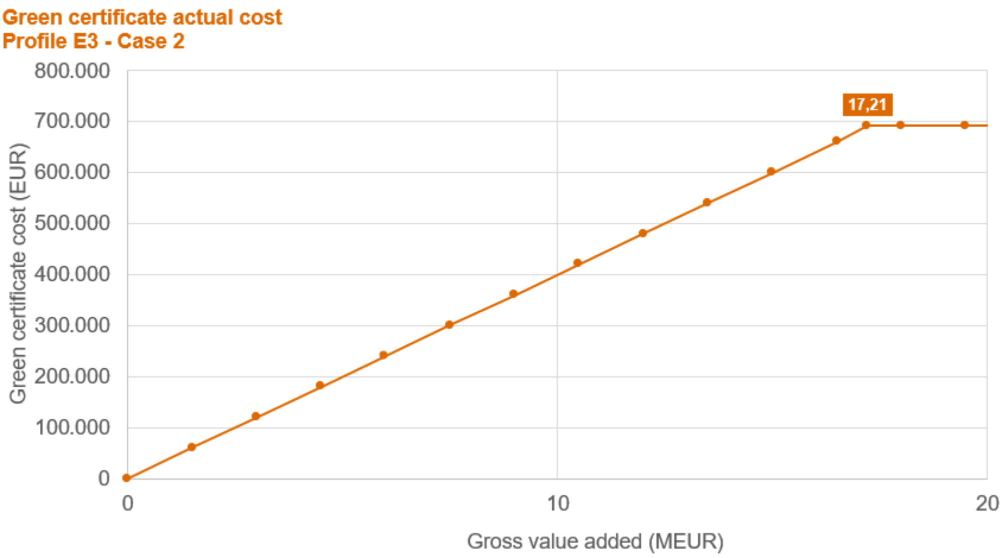
[332] (European Commission, 2014-2020)

Figure 61: CHPC and GC actual cost for profile E3 (Case 1)



Considering only Profile E3 companies with NACE codes from Annexe 3 from the EEAG (case 2), a company benefits from the application of the cap as long as its gross value added is less than 17.209.467 EUR.

Figure 62: CHPC and GC actual cost for profile E3 (Case 2)



KEY FINDINGS

The analysis of the E3 profile leads us to the following findings:

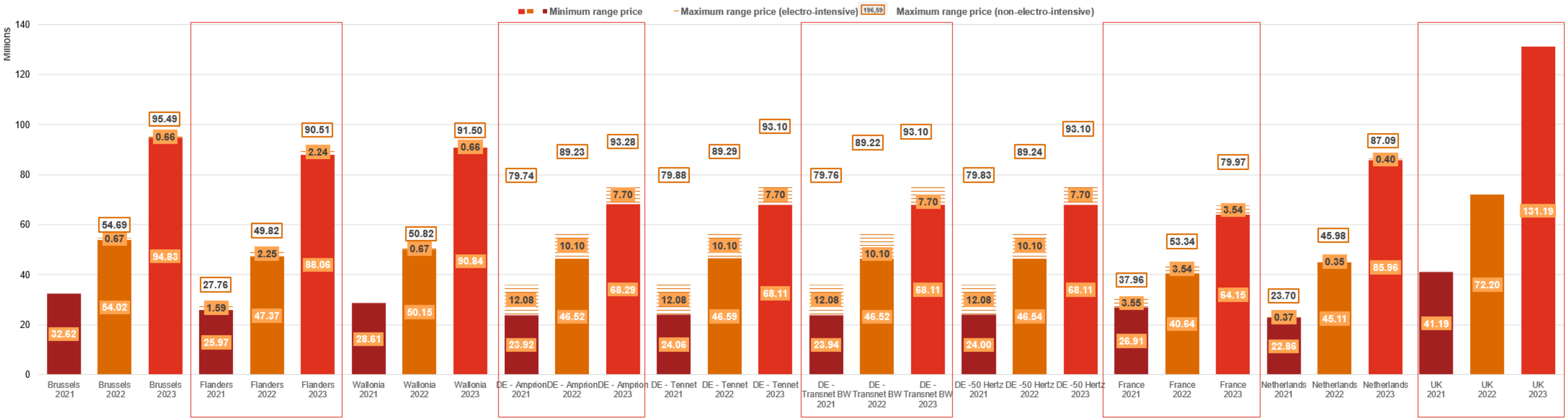
- The total invoice ranges from **13,33 MEUR/year** (min. range France) to **26,27 MEUR/year** (the UK) when comparing electro-intensive consumers, while the UK remains the least competitive with 26,27 MEUR/year for non-electro-intensive consumers.
- **In Belgium, we observe that Flanders will always be the most competitive region**, whether we compare for electro-intensive consumers, which is in line with the result from last year. The total invoice has increased significantly in all regions/countries under review due to the increase of the commodity component. The difference between Brussels and Wallonia is small (0,13 MEUR/year), but in favour of Brussels.
- The **commodity cost** is different for this profile than E2 because we estimate the consumer to consume 24/7. We see the lowest cost in France. This component makes up most of the invoice, even for non-electro-intensive consumers in Germany where the commodity component now accounts for 50% of the invoice.
- The network cost is a small component in the total invoice, especially in Germany and France. The reductions on transmission costs are based either on electro-intensity or consumption profile criteria. Consequently, the comparison of network costs within countries is seriously impacted, given the high range of possible reductions. Ultimately, France (considering minimum price option) turns out to be the most competitive country because of these reductions.
- Lastly, the **all other costs component** is the highest in the UK (26 EUR/MWh), followed by Brussels and Wallonia. The other regions/countries consider reduction and even exemption schemes for certain types of consumers. Falling under one of these reduction schemes can have a big impact, for example a reduction up to 16 EUR/MWh for electro intensive profiles in Germany.

Profile E4 (Electricity)

Total invoice analysis

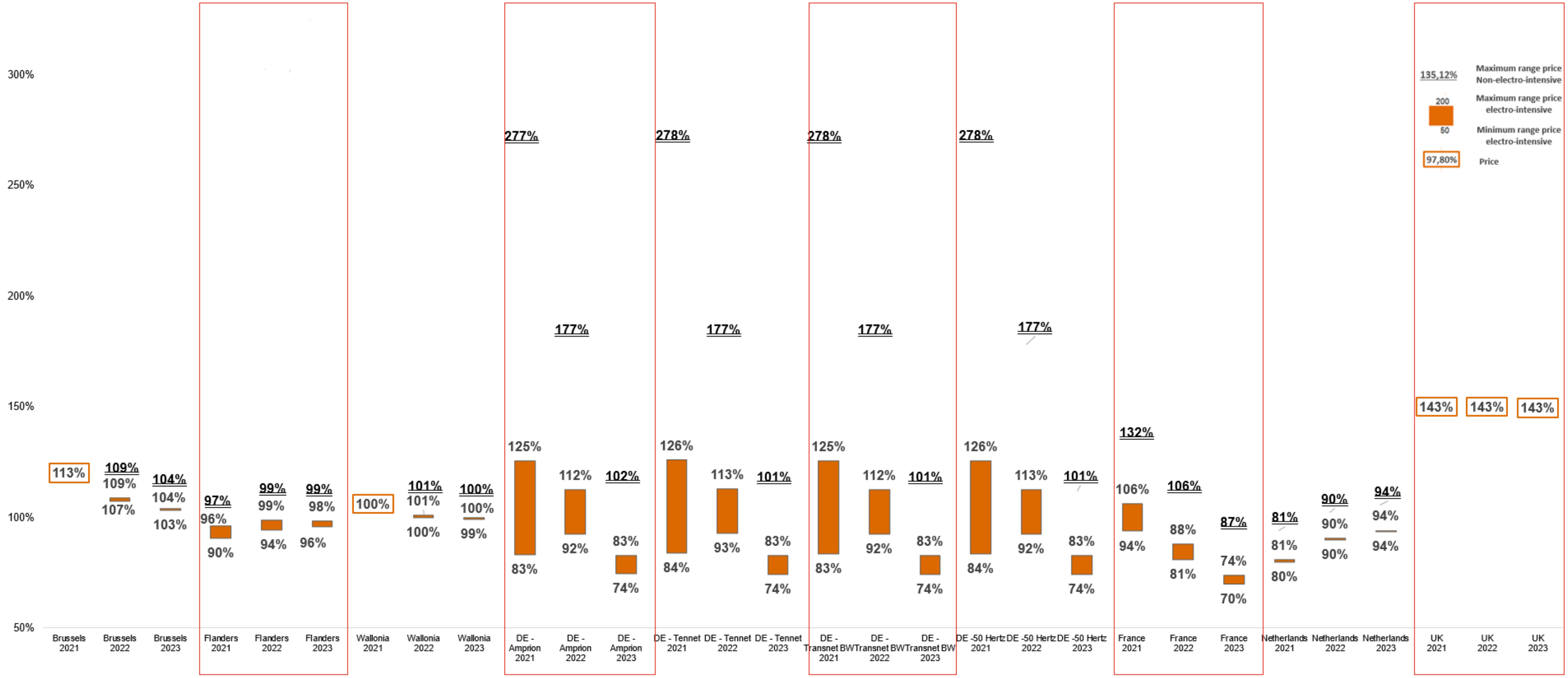
The figure below provides a comparison of the total yearly invoice paid by an industrial profile E4 in the different studied regions/countries. The results are expressed in MEUR/year.

Figure 63: Total yearly invoice in MEUR/year (profile E4)



Below, we compare each region and country's yearly bill with the average Belgian price, which is set at 100. The Belgian average is computed as the mean between Brussels', Wallonia's and Flanders' minimum and maximum prices.

Figure 64: Total yearly invoice comparison in % (profile E4; Belgium Average 2023 = 100)



The total invoice has increased in all the reviewed regions/countries (between 65% to 94% increase compared to last year) and the total invoice ranges from 64,15 (minimum range France) to 131,19 MEUR (the UK) for electro-intensive consumers. For non-electro-intensive consumers, the price can be up to 131,19 MEUR in the UK (same as for electro-intensive consumers). Like the E3 profile, France can again offer the lowest price and the difference from the other regions is even more evident, being around 4 MEUR cheaper than the 2nd cheapest region, Germany. In Belgium, Brussels is again the most expensive region for the E4 profile in 2023, followed by Wallonia.

While there are a lot of ranges to consider, the difference in competitiveness between Flanders and Wallonia is very small if we take the maximum range for non-electro-intensive consumers into account (90,51 and 90,50 MEUR/year), with Brussels behind (95,49 MEUR).

For electro-intensive profiles we can conclude that France is the cheapest zone, followed by Germany and then the Netherlands. However, the situation changes for non-electro intensive profiles, where France remains the most competitive, but is followed by the Netherlands and then the Wallonia and Flanders regions.

In Germany, the existing variance depends on the relative size of power costs in the consumer’s gross value added. When the average annual electricity cost over the last three years represents less than 14% of the gross value added of an industrial consumer, the consumer inevitably pays the maximum rate, thereby lowering its competitiveness. We also note that the German competitive position (compared to Belgium average) has improved for E4, like it was observed for E3. The minimum and maximum ranges are now more below around the Belgian average, between 74% to 83% of the Belgian average for 2023.

Breakdown per component

The previous results are further detailed for profile E4 in the figure below, which provides a closer look at the breakdown of the different price components.

Figure 65: Electricity price by component in EUR/MWh (profile E4)

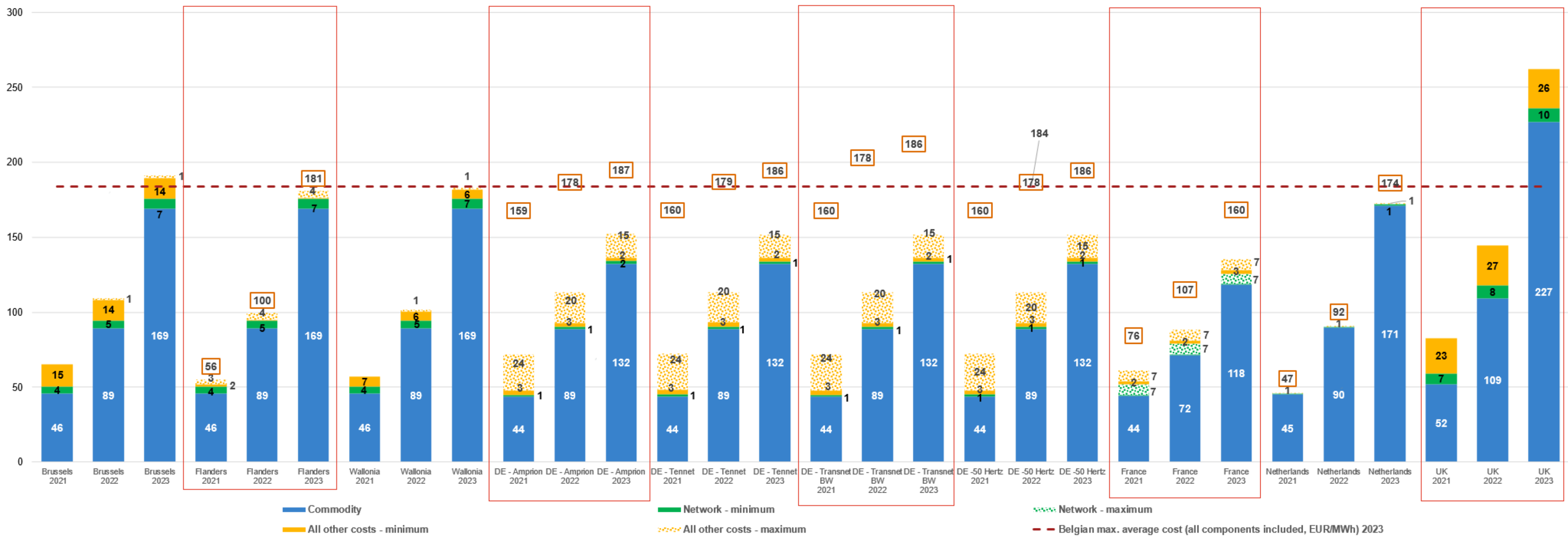
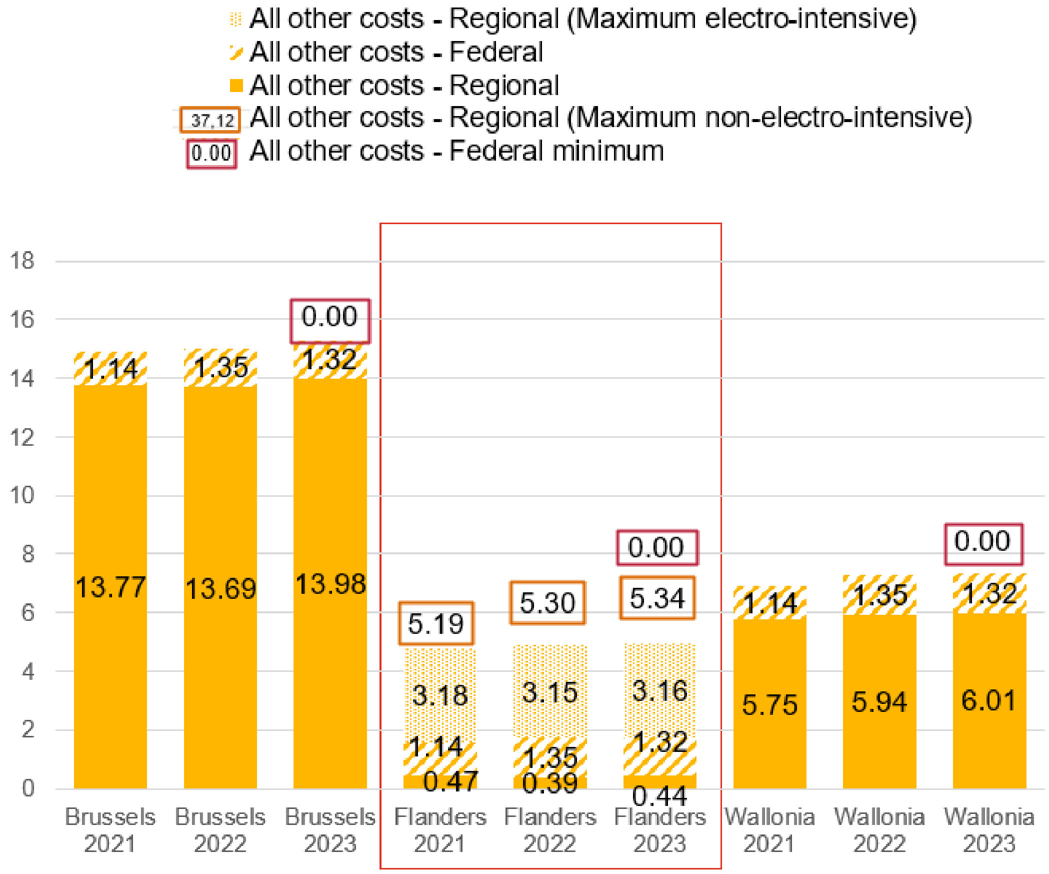


Figure 66: Regional and Federal all other costs in Belgium in EUR/MWh (profile E4)



Again, **commodity costs** are identical to costs displayed for E3. Therefore, an identical situation is observed across all the regions/countries. The lowest cost is found in France followed by Germany. Conversely, the UK comes as an outlier with 227 EUR/MWh. The commodity cost is the biggest component in the total invoice, even for the non-electro intensive profiles in Germany where this component accounts for almost 70% of the total invoice.

Network costs only represent a limited proportion of the final bill. However, countries such as Germany, France (minimum price option) and the Netherlands display lower transmission costs given the fact that reductions are granted to large consumers depending on electro-intensity or consumption criteria. Germany and the Netherlands opt for a direct 90% reduction fee whereas France's reductions vary from 20% to 90%. These reductions profoundly alter the comparison of network costs in between countries, and especially in the case of Germany, which would have the highest network costs otherwise. The UK has the highest network cost (10 EUR/MWh). For Belgium, given the fact that the transmission tariffs approved by the CREG are (almost) stable over the 2020-2023 period, the increase in the network costs component observed between 2022 and 2023 is a direct consequence of the increase in the commodity cost and the network losses percentage fixed by the TSO. Indeed, the costs of network losses on the federal transmission grid (380/220/150 kV) are, for the purpose of this study, considered as a component of network costs and suppliers usually bill these costs as a percentage (fixed every year by the TSO) of the commodity cost.

While the **all other costs component**[333] can have varying importance among countries, it is again mainly dependent on the (non-)electro-intensive nature of consumers. Significant reductions are potentially granted on taxes through a refund scheme which makes the Netherlands one of the countries with the lowest possible tax level. However, electro-intensive consumers do not see the European minimum tax level (0,50 EUR/MWh) yet applied at their consumption level since the reduction through the "Teruggaaf over energiebelasting en ODE" in the Netherlands is higher. Due to the change in the departmental and municipal taxes gathered under the energy excises, France has become the most competitive option for non-electro-intensive profiles. As observed previously, Flanders, Germany and France have all three implemented policies that enable electro-intensive consumers to benefit from significant reductions, with France being the most competitive amongst these three regions/countries when it comes to this component.

Regarding taxes, Wallonia's tax level is slightly above than Flanders' in the case of non-electro-intensive consumers.[334] Similarly to the other industrial profiles under review, we see a price range also for Brussels and Wallonia due to the possible exemption on the federal excise duty. The slight increase of federal costs in the Belgian regions compared to 2021 is related to the fact that, to comply with EU regulation, the cap at 250.000 EUR/year applied in 2021 to the federal contribution and to the federal PSO financing of green federal certificates has been replaced since last year by a special excise duty with a rate of 0,5 EUR/MWh for the yearly consumption above 100.000 MWh.

Impact of Flanders' combined cap on profile E4

The cost of green certificates can have a big impact on the energy price of large industrial consumers. To limit these costs, Flanders introduced two caps, in 2018, on the cost of financing of renewable energies. These caps are in proportion to the Gross Value Added (GVA) of the company and thus vary from company to company. As depicted more extensively in section "Impact of Flanders' cap on profile E0", the following exercise attempts to illustrate the potential impact of these caps on the industrial consumers.

Table 127: Flanders' cap on profile E4

	Case 1	Case 2
NACE codes[335]	Annexe 3 or 5 EEAG	Annexe 3 EEAG
Electro-intensity	> 20%	No threshold
Cap (% of GVA)	0,50%	4%
Average yearly consumption (E4)	500 GWh	
Scheme cost (without cap)	1.582.360,25 EUR	
Maximum gross value added to benefit from the cap	316,47 MEUR	39,56 MEUR

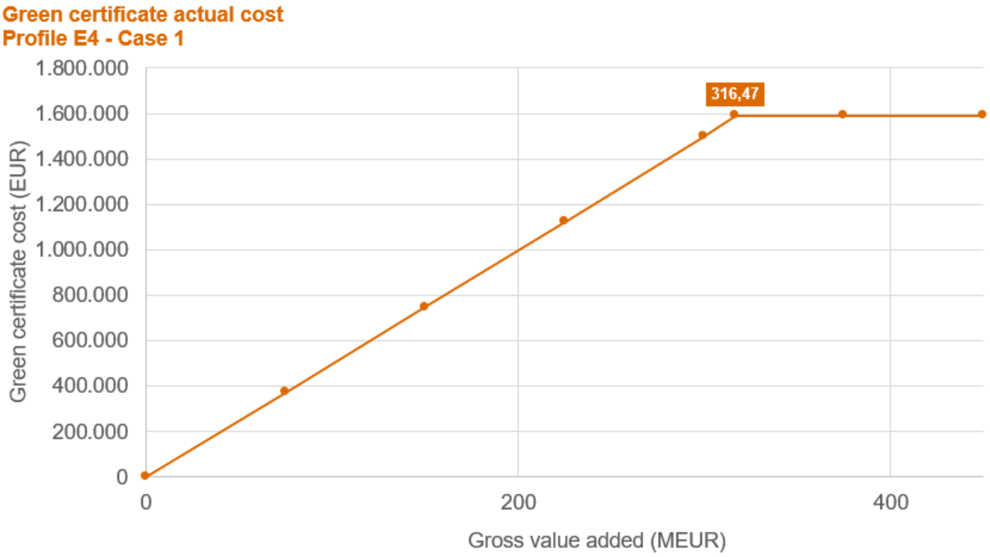
[333] This cost includes taxes, levies and certificate schemes.

[334] In addition to the degressivity rules and limits that apply the larger profiles (E2 and higher) do not pay a part of the all other costs, namely the part billed through the DSO, which the smaller profiles do pay.

[335] The companies listed in Annexe 3 and 5 of EEAG correspond to the companies listed in the Energiedecreet except for Nace 3832 (Recycling of waste) which is listed in Annexe 3 EEAG but not in the Energiedecreet.

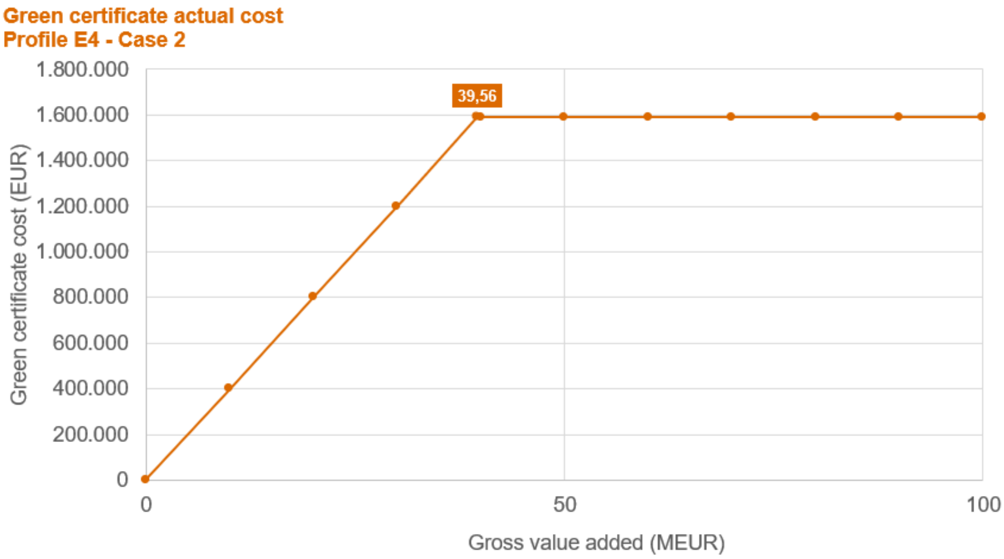
Considering only Profile E4 companies with NACE codes from Annexe 3 or 5 from the EEAG and with an electro-intensity above 20% (case 1), a company benefits from the application of the cap as long as its gross value added is less than 316.472.050 EUR.

Figure 67: CHPC and GC actual cost for profile E4 (Case 1)



Considering only Profile E4 companies with NACE codes from Annexe 3 from the EEAG (case 2), a company benefits from the application of the cap as long as its gross value added is less than 39.559.006 EUR.

Figure 68: CHPC and GC actual cost for profile E4 (Case 2)



KEY FINDINGS

The analysis of the E4 profile leads us to the following findings:

- The total invoice ranges from **64,15 MEUR/year** (France) to **131,19 MEUR/year** (the UK) for electro-intensive consumers and **131,19 MEUR/year** (the UK) for non-electro-intensive consumers. The total invoice has increased in all the regions compared to 2022, explained by the sharp increase of the commodity component. Like last year, Flanders is again the cheapest Belgian region, though by a small margin.
- **Commodity costs** represent the most significant component in E4 consumers' final bill, even for non-electro-intensive consumers in Germany where it can account for almost 70% of the total bill. While France has the lowest fares for the commodity component, the UK constitutes the most expensive country, similarly to the other industrial profiles.
- **Network costs** are a reduced constituent of the electricity invoice. Further reductions granted on large consumers by countries such as Germany, France and the Netherlands lead to competitive disadvantages for other countries. The UK has the most expensive network costs (10 EUR/MWh).
- **All other costs** span a vast range of potential levels all very different across regions/countries. However, specific attention is brought to Flanders, Germany, France and the Netherlands where electro-intensive consumers may benefit from substantial reductions.

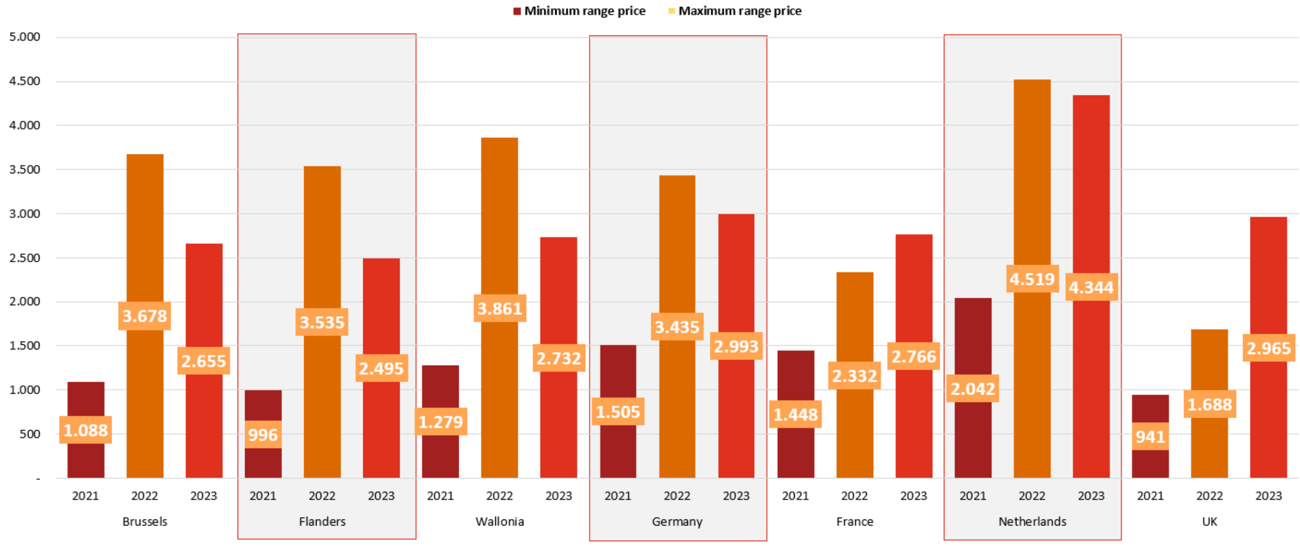
Presentation of figures (Natural gas)

Profile G-RES (Natural gas)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by a residential profile G-RES in the different studied regions and countries. The results are expressed in EUR/year.

Figure 69: Total annual invoice in EUR/year (profile G-RES)



Again, Belgium is split into three regions due to the existence of regional differences, but contrary to the electricity analysis we present Germany as one zone. Nevertheless, we have also taken regional differences into account for the other countries, but only one weighted average cost is presented in the table.

The figure above shows that the total annual invoice has decreased compared to 2022 in most of the countries and regions under review, except in France and the UK. If the price increase remain below 20% in France, natural gas total invoice for UK rose by more than 75% in 2023 for residential consumers.

The largest price drop compared to last year is seen in Belgium. Furthermore, we observe that the Netherlands remains the most expensive country regarding natural gas for residential users, despite a decrease in the total invoice in 2023.

Where the UK was the most competitive region last year with a total annual invoice of more than 25% less than the second most competitive region (France), the situation has completely reversed this year. This is explained by an increase of more than 25% of the commodity component in the UK. In France the regulated tariff cannot prevent a rise in prices, and the country now stands in the middle of the pack.

Breakdown per component

The previous results are further detailed for profile G-RES in the figure underneath, which provides a closer look at the breakdown of the different price components in EUR/MWh.

Figure 70: Natural gas price per component in EUR/MWh (profile G-RES)

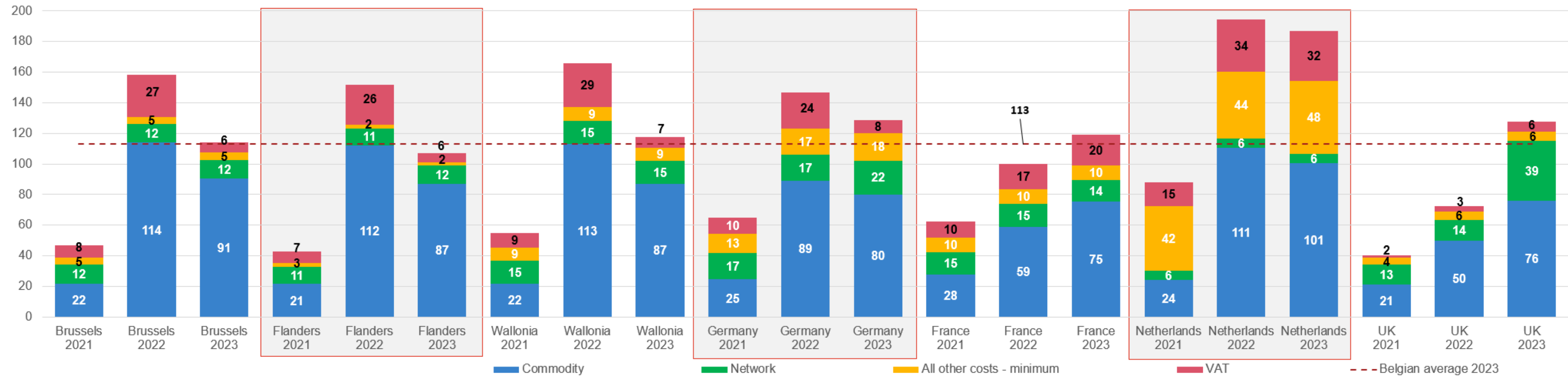
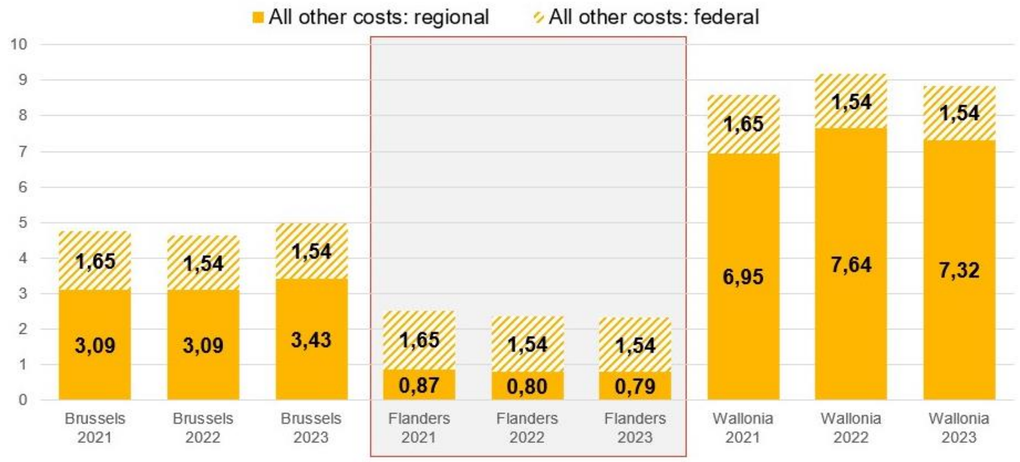


Figure 71: Regional and Federal all other costs in Belgium in EUR/MWh (profile G-RES)



The commodity component has decreased in Belgium, Germany and the Netherlands, but has increased in France and in the UK. Despite a price raise in the country, the lowest commodity component is observed in France. On the other hand, the largest price drop is observed in Belgium, where the average commodity cost for 2023 is 88 EUR/MWh, a 22% decrease compared to the price of last year.

The second most important component after commodity in most of the reviewed regions is the **VAT component** which primarily depends on the total invoice. The VAT rate[336] lies between 5 and 21%. The VAT is the lowest in the UK, because of the rate, and the highest in the Netherlands, because of the high total invoice and the higher rate. Furthermore, we note that France also uses a 5% VAT-rate but only on the consumer's subscription and CTA[337]. Belgium has lowered its VAT tariffs, in 2023 6 % is charged (instead of the 21% in 2022). In Germany taxes decreased from 19% in 2022 to 7% in 2023. The Netherlands had a lowered VAT in the last months of 2022 but as of 2023 the usual VAT tariff (21%) was applied again.

Except for the Netherlands, the **network component** is the third most important component after commodity and VAT. Flanders and Brussels (12 EUR/MWh) are the second most competitive, after the Netherlands (6 EUR/MWh), regarding this component. The UK has the highest network costs (39 EUR/MWh). Overall the network cost has remained very stable between 2022 and 2023, except for UK[338]. While the Netherlands is the most expensive country for the G-RES profile, it has the lowest network cost. In Belgium there is a difference between the regions regarding this component. Flanders and Brussels are the second cheapest regions overall (12 EUR/MWh) and Wallonia is one of the most expensive regions (15 EUR/MWh) regarding this specific component.

The component where we see the most fluctuation between countries is the **all other costs component**[339]. Considering the Netherlands, the height of their all other costs component, in particular the energy tax, makes them the most expensive country under review. This component has remained quite stable compared to 2022 for all countries under review. In Belgium we made the distinction between regional and federal all other costs and the regional component makes a big difference in the competitiveness between the Belgian regions. The regional all other costs component in Wallonia (7,32 EUR/MWh) is more than twice as high as Brussels (3,43 EUR/MWh) which is 4 times higher than the regional all other cost of Flanders (0,79 EUR/MWh).

[336] As stated in the "General assumptions" section, we did not include in the calculations any change of the VAT levels that were effective after January 2022, such as the lowering of VAT to 6% on electricity and gas in Belgium as of 1st March 2022.

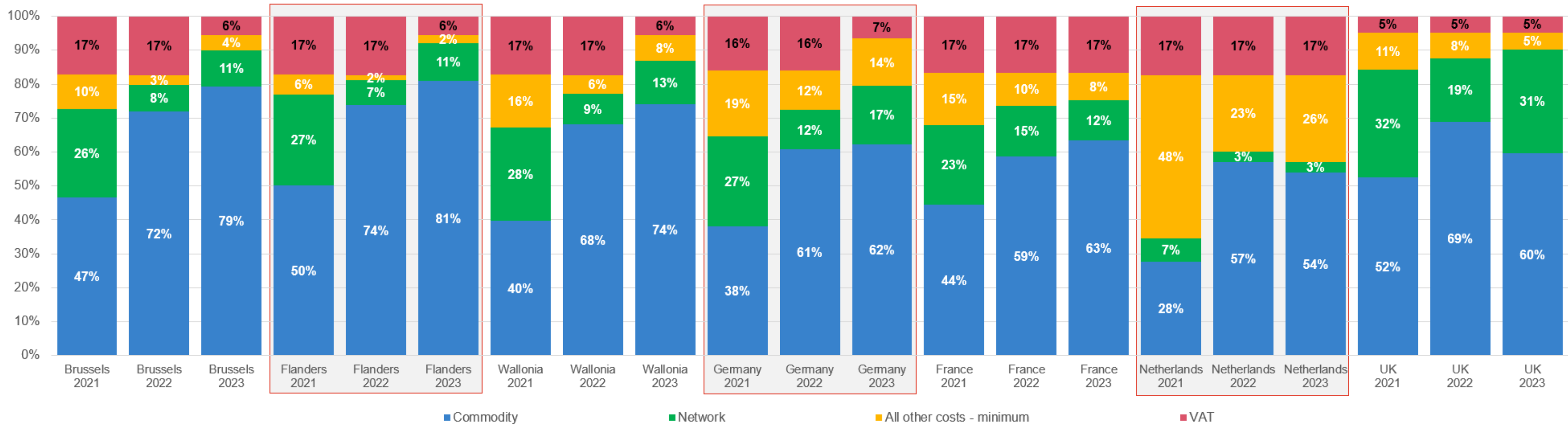
[337] Contribution tarifaire d'acheminement

[338] There are different regional caps which reflect differences in network costs across the UK (see p.23 of the following document for more details : https://researchbriefings.files.parliament.uk/documents/CBP-9714/CBP-9714.pdf).

[339] This cost includes taxes, levies and certificate schemes.

Proportional component analysis

Figure 72: Proportional component analysis (profile G-RES)



Since 2022, the **commodity component** is the most important component in all the regions/countries. The weight of the commodity component lies between 54% and 81% in 2023.

Furthermore, we see that the importance of the **network cost component** varies significantly between regions/countries. It falls between 3% and 31%, with on one hand the UK being the country where the **network cost component** is proportionally the most important, due to higher electricity distribution and transmission costs.[340] On the other hand, the Netherlands, which remains the country where this component is proportionally less important (only 3%). This is explained by the proportional difference in the increase of the commodity component in these 2 countries.

We do see that the importance of the **all other costs component** differs between regions/countries, but Belgium remains the country where the weight of this component is the lowest among the regions under review, with Brussels, Flanders and Wallonia being the three regions where this component is the least important, accounting for 2% to 8%. France also has an 8% weight of other costs. The Netherlands is clearly an outlier regarding this component since it makes out 26% of the total invoice. Even though the ODE was removed in 2023, the Dutch government increased to Energy Tax to encourage more sustainable energy options.

The weight of the **VAT** component is very similar among all countries except for France and the Netherlands. In Belgium the VAT rate of 6% applies since April 2022. Germany has decreased the VAT rate on natural gas to 7% since 1 October 2022.

[340] Source: https://bionic.co.uk/blog/noticed-energy-prices-have-fallen-over-past-few-months/

KEY FINDINGS

The results reported above suggest the ensuing key findings regarding profile G-RES:

- Comparing 2022 and 2023 we see that the total invoice has decreased in most countries and regions except for France and the UK, with the biggest change being a decrease of 1.129 EUR/year in Wallonia. The decrease in the commodity price and in the VAT are the main reasons of this trend in all the regions/countries under review.
- If in 2022 the UK was the cheapest country for the G-RES profile, it is not the case anymore in 2023, mainly due to the higher commodity component and increased network costs. Total price for G-RES profile in now more or less in line with what is observed in Belgium, Germany and France.
- Flanders is now the cheapest (Belgian) region, because the **regional all other costs component** is (much) higher in the other two Belgian regions.
- As of 2022, the **commodity component** makes up the biggest part of the total invoice of all countries. Overall, Flanders proportionally has the highest percentage of commodity component.
- The **network cost component** varies importantly between regions/countries with figures ranging between 3% (the Netherlands) and 31% (the UK) of the total invoice of the regions/countries under review.
- Lastly, the **all other cost component** plays a key role, together with the commodity component, in determining the competitiveness of a region/country regarding the G-RES profile. The low network cost in the Netherlands is largely compensated by a high all other costs component.

Profile G-PRO (Natural gas)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by a professional profile G-PRO in the different studied regions/countries.

Figure 73: Total annual invoice in EUR/year (profile G-PRO)

The annual invoice has increased for all regions/countries under review in 2023 for the G-PRO profile, although the increase is less extreme than the move from 2021 to 2022.

The annual invoice for G-PRO is the cheapest in Germany. Flanders, France and Brussels follow, with close figures among them. Wallonia stands in the middle of the pack, while the UK and the Netherlands are the most expensive countries here, with the Netherlands (the most expensive country) being almost 39% more expensive than the cheapest region (Germany).

When comparing to the G-RES profile, the case of France stands out. France was the cheapest for the G-RES profile because it offers regulated prices to households, but the country remains also competitive with G-PRO profile when market price is used to calculate the commodity component, with only Germany and Flanders being cheaper.

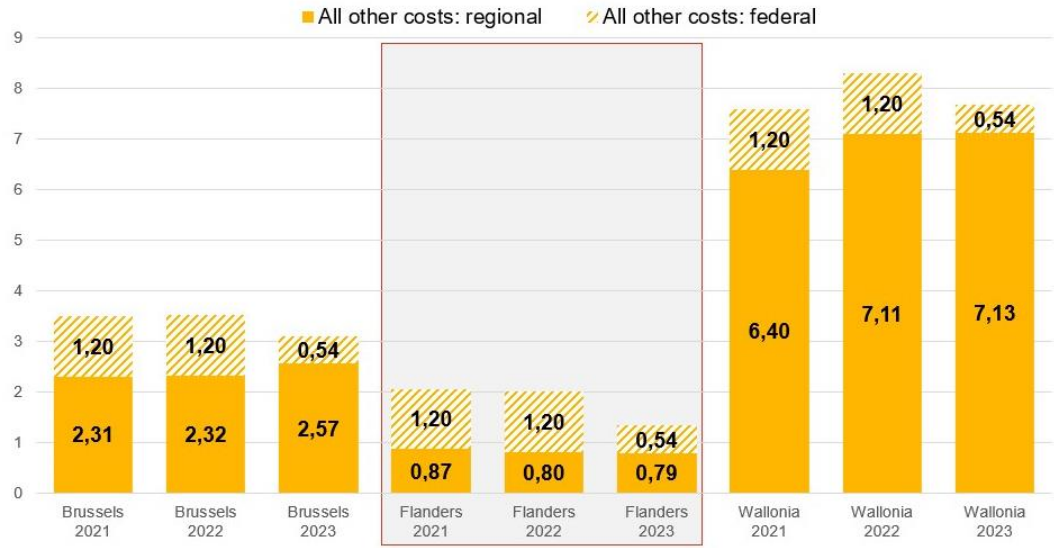
As it was the case for the G-RES profile, the Netherlands is still an outlier because of the all other costs component, in particular the energy tax, which will also become more apparent in the figure below detailing the different components.

Breakdown per component

The previous results are further detailed for profile G-PRO in the figure underneath, which provides a closer look at the breakdown of the different price components.

Figure 74: Natural gas price per component in EUR/MWh (profile G-PRO)

Figure 75: Regional and Federal all other costs in Belgium in EUR/MWh (profile G-PRO)



The first component we will analyse is the **commodity component**[341] which has been computed according to the market price and not through comparison websites. This explains why the commodity cost does not alter between the Belgian regions for the G-PRO profile and onwards. After the substantial increase of the commodity component cost in 2022 (average of 475% increase between 2021 and 2022, among the regions under review), the commodity price rise has been more limited this year. Germany is the only country with a lower commodity price than last year, due to the capping mechanism in place, and is at the same time the country with the lowest commodity cost. As in previous years, the commodity component is very similar from one region to another. Belgium and the Netherlands are the countries which have the highest commodity component, i.e.122,82 and 122,87EUR/MWh (those amounts take into account the capping mechanism in place, which virtually decreases the importance of cost components to reflect the reality of end-consumers). An important notice is Germany's commodity price for all industrial consumers having a displayed cost of 120,85 EUR/MWh. The commodity price[342] retrieved is higher (125,34 EUR/MWh). However, the application of a price cap on gas and electricity prices this year in Germany (all taxes, levies and network costs included) virtually decreases the value displayed. Hence, while we will mention a lower commodity cost in Germany, it needs to be taken with consideration.

There are a few observations that can be made regarding the **network cost component**. The smaller network costs are observed in the Netherlands, followed by Belgium and France. Differences among Belgian regions are however noticeable. The most expensive network cost (Wallonia, 10 EUR/MWh) is 3 EUR/MWh higher than the cheapest network cost (Flanders, 7 EUR/MWh). On the other hand, Germany's network costs are the second highest only after the UK. All in all, we see that the network cost component has remained stable between 2021 and 2023 for all countries and regions reviewed, except for the UK where it more than doubled since last year, due to higher electricity distribution and transmission costs[343].

[341] The large increase of the commodity component in Belgium compared to 2020 is the result of the adapted methodology that takes the natural gas price of January which is inconsistent with the yearly average. The methodology behind the natural gas commodity price will be updated next year as detailed in Chapter 5: Large industrial consumers (p.190).

[342] In this study, natural gas commodity prices are estimated based on market prices. As previously mentioned, we consider one market area in Germany, the Trading Hub Europe (THE), which is the result of the merger between Gaspool and Netconnect Germany (NCG).

[343] Source: https://bionic.co.uk/blog/noticed-energy-prices-have-fallen-over-past-few-months/

Lastly, we have the **all other costs component**[344] which is one of the components that has the most effect on the overall position of the region/country. The regions/countries, that have the lowest all other costs is Flanders, followed by Brussels and then the UK. While this component is the by far the highest in the Netherlands, France, Wallonia and Germany stand in the middle of the pack.

Additional observations must be made regarding Germany and the Belgian regions. First, in Germany the range on the *Energiesteuer* has not changed between 2021 and 2023 because the taxes and the reductions have stayed the same. However, the introduction of the "*CO2 Steuer*", or carbon tax, (5,461 EUR/MWh) is the main responsible for the large increase of the all other costs component compared to 2021[345]. Second, in Belgium we have made a distinction between the regional and federal all other costs and we see that the regional cost in Wallonia is much higher (7,13 EUR/MWh) than in Flanders (0,79 EUR/MWh) and Brussels (2,57 EUR/MWh) (mainly because of the regional PSO).

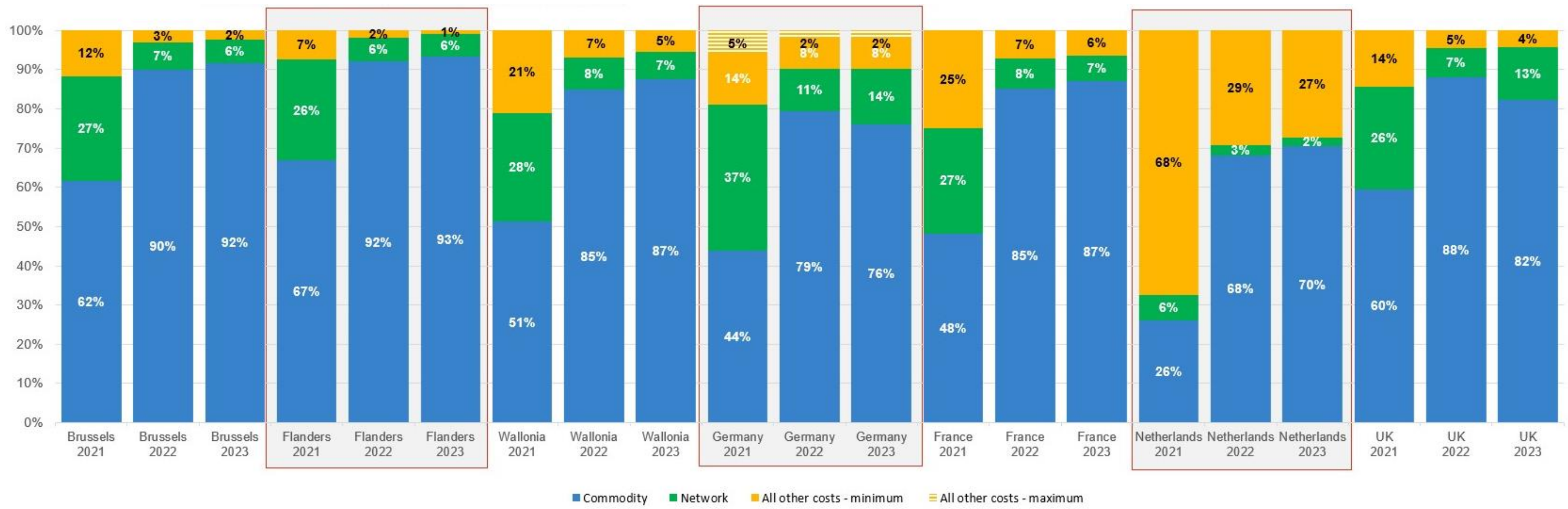
[344] This cost includes taxes, levies and certificate schemes.

[345] This tax is effective since January 1st, 2021, but it was not included in the previous version of this report, thus explaining the difference with 2021.

Proportional component analysis

The percentages of the costs for each component can be found in the underneath figure.

Figure 76: Proportional component analysis (profile G-PRO)



The figure above clearly shows that the commodity is the dominant component in all regions/countries. It makes up more than 85% of the total invoice in 4 of the 7 observed regions/countries and even up to 93% in Flanders. Similar to the immense increase of the commodity component from 2021 to 2022, this year the component maintains its position as the prime component of the total invoice.

The weight of the network cost and all other costs components have decreased in most of the countries/regions, except for Germany and the UK where the network costs have increased again. The network costs are more important in Germany than in any other region/country while the all other costs component makes up 27% of the total invoice in the Netherlands. In Belgium we see that the weight of the all other costs makes up 5% of the invoice in Wallonia while this is around 2,5% or less in Brussels and Flanders, highlighting again the regional differences.

KEY FINDINGS

The results reported above suggest the ensuing key findings regarding profile G-PRO:

- The total invoice has seen an increase for all regions/countries compared to last year, except for Germany (due to the capping mechanism). This is mainly due to a raise of the commodity component.
- The Netherlands is the most expensive country under review and is thus the least competitive regarding the G-PRO profile. This is mainly due to the very high all other costs component. On the other hand, Germany is now the least expensive country due to the capping mechanism applied. Flanders comes second this year, closely followed by France. Brussels and Wallonia come next.
- The **commodity component** is again the most important component in all countries and regions, regarding the total invoice. It represents up to 93% of the total invoice (Flanders).
- The **network cost component** varies across all the regions/countries, going from 4 EUR/MWh in the Netherlands to 19,58 EUR/MWh in the UK..
- Lastly, we have the **all other costs component** which has a big impact on the positioning of the regions/countries, whether we look at all regions/countries or within Belgium. Wallonia has the highest all other costs of the three Belgian regions, Flanders having the lowest all other costs.

Profile G0 (Natural gas)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by an industrial G0 profile in the different studied regions and countries. The results are expressed in kEUR/year.

Figure 77: Total yearly invoice in kEUR/year for industrial consumers (profile G0)

For the G0 profile, the total invoice has increased in all the regions/countries under review. Furthermore, Germany is not the only region/country with a price range anymore since we take the possibility of a reduction of the TICGN in France starting with the G0 profile.

The overall positioning of the regions/countries is quite stable when comparing G-RES and G-PRO, but at G0 a change can be noticed. Like for G-PRO, Flanders is still the cheapest country for the G0 profile (but only if reductions don't apply), closely followed by Germany. Wallonia and Brussels are still behind Flanders, but they remain among the cheapest regions. The Netherlands, and to a lesser extent the UK, are still largely behind the other regions/countries.

Figure 78: Total yearly invoice comparison in % (profile G0; Belgium average = 100%)

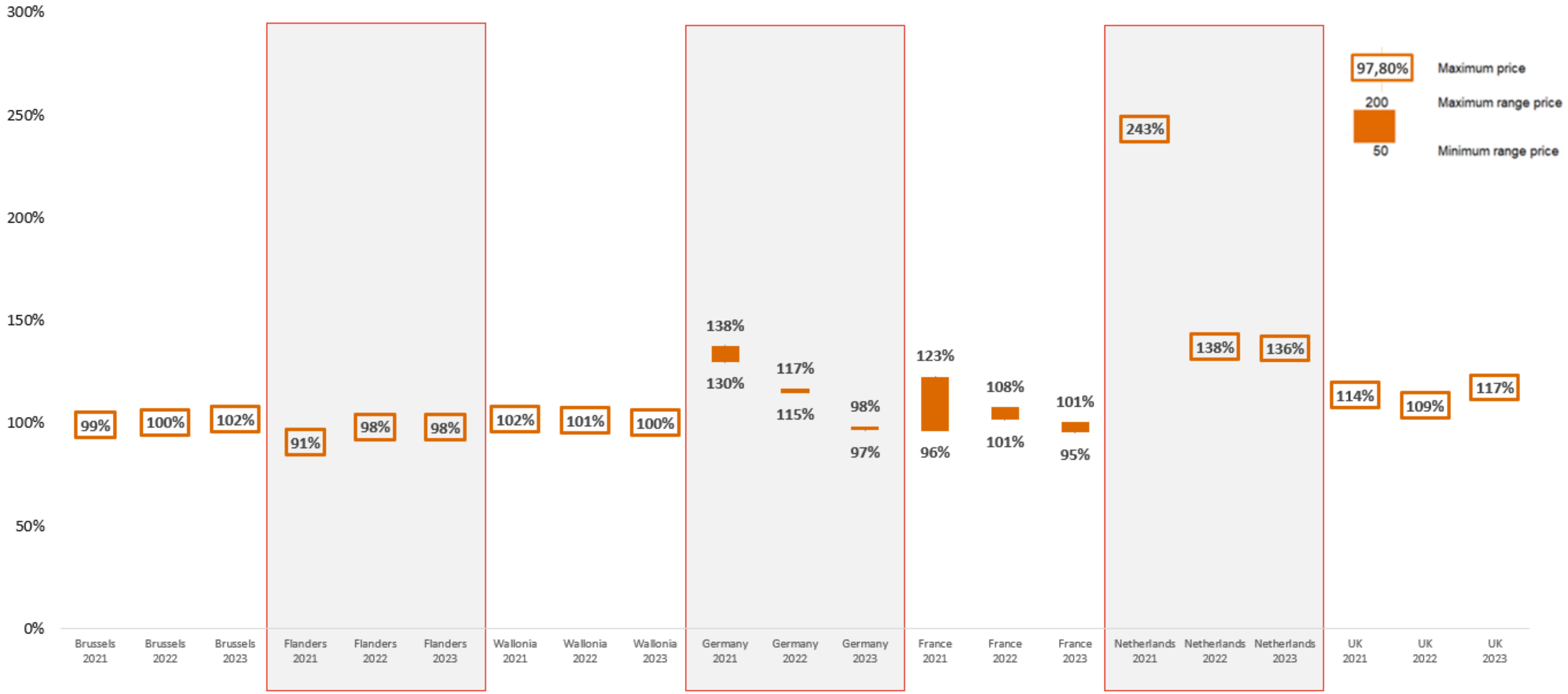


Figure 78 takes the Belgian average and positions the other regions/countries against this average to see if they are above or below or both if there is a range to consider. The figure shows the result from 2021 to 2023 and we have thus taken the Belgian average of their respective year into account. This figure gives a good idea of the competitivity of a region/country compared to Belgium. Overall, we see that the competitiveness of our neighbouring regions/countries has increased compared to Belgium since the percentual difference between the total invoice of the neighbouring country has dropped considerably compared to last year. Both France and Germany are equally or more competitive than Belgium depending on the reduction in 2023. The Netherlands, which was the least competitive country under review in 2022, saw its total invoice go from 38% to 36% above the Belgian average. The UK and the Netherlands are still above the Belgian average by 17% to 36%. Overall, we observe a convergence between the regions/countries under review due to the general increase of the commodity price.

Breakdown by component

The previous results are further detailed for profile G0 in the figure underneath, which provides a closer look at the breakdown of the different price components.

Figure 79: Natural gas price by component in EUR/MWh (profile G0)

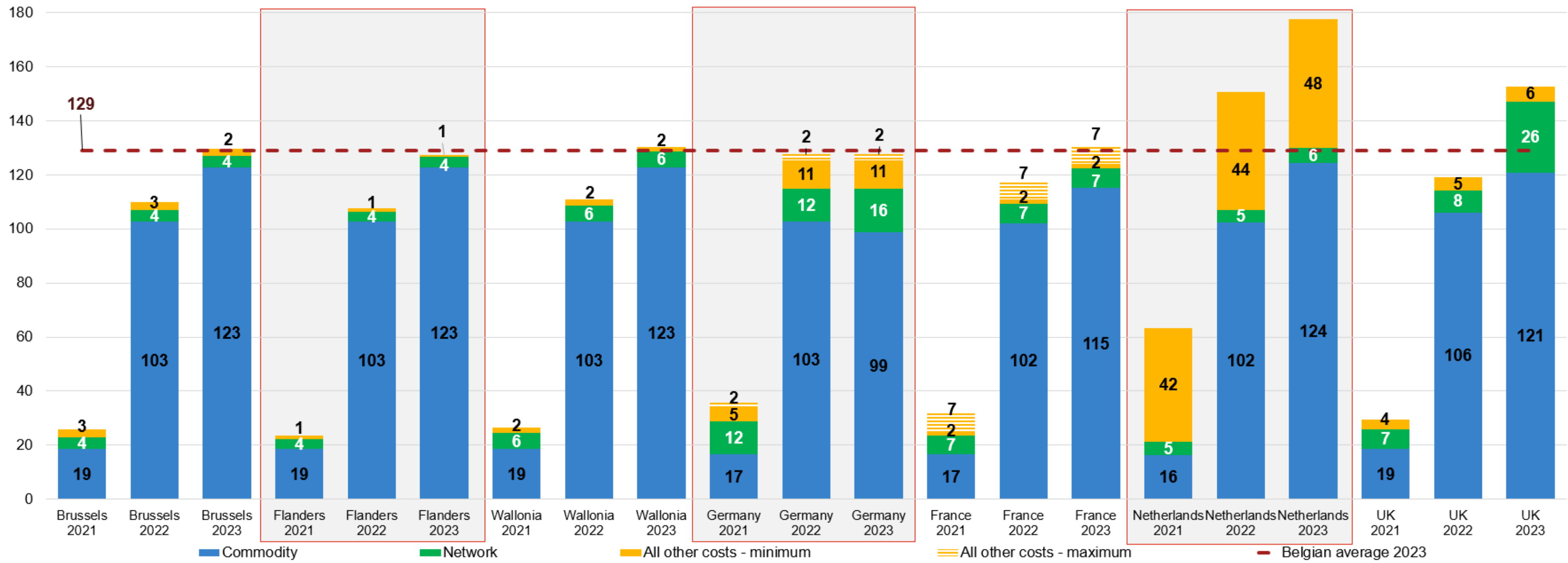
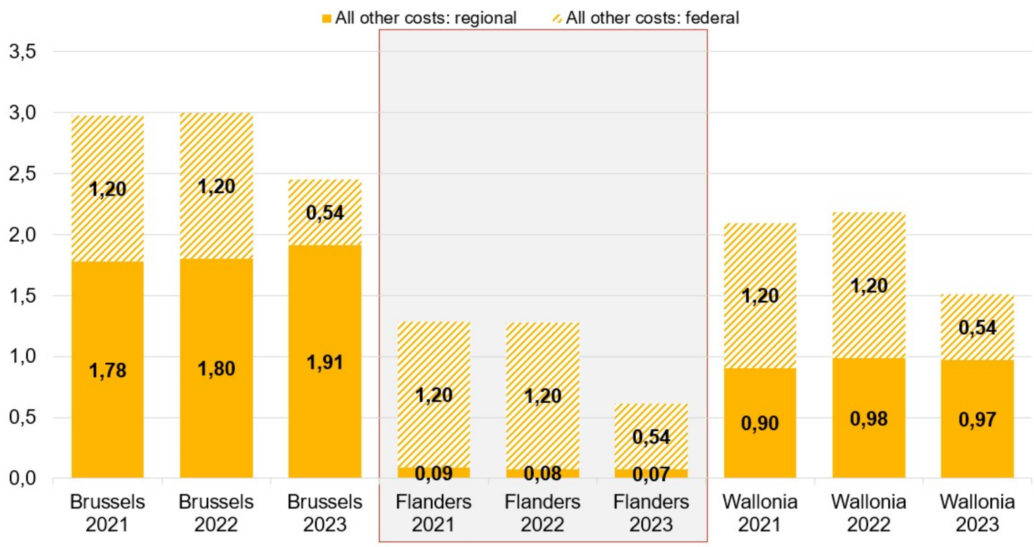


Figure 80: Regional and Federal all other costs in Belgium in EUR/MWh (profile G0)



Since the **commodity cost** is based on the market price and this is the same for all the bigger consumer profiles (G-PRO - G2) the price per MWh will remain the same. Only exception to this rule for this year is Germany, due to the capping mechanism in place. Nevertheless, the importance of this component in the total invoice bill will vary across countries and regions, as some may have cheaper network costs and/or all other costs. The commodity component is a critical component and makes up more than 80% of the total energy bill in all countries and regions under review except for the Netherlands, where it makes up for around 70% of the total invoice.

The **network cost** is still an important component of the total bill in the UK and to a lesser extent in Germany. Belgium showcases on average the lowest network costs. Among the country, Flanders has the lowest network costs for this profile, closely followed by Brussels. On the other hand, Wallonia show network costs almost 50% higher than Flanders.

Lastly, the **all other costs component**[346] has not experienced important variations since last year, making its proportional weight smaller in 2023 than in 2021 for all regions and countries reviewed. While both Germany and France have a price range, falling under the reduction scheme is much more beneficial in France. The competitive position of Germany compared to other regions/countries will not change whether the reduction is applied or not, but it can have a big impact on the competitive position of France. In Germany, the introduction of the "*CO2 Steuer*", or carbon tax, (5,461 EUR/MWh) is the main responsible for the large increase of the all other costs component compared to 2021[347]. In Belgium we observe that the regional factor in EUR/MWh becomes less important when comparing it to smaller consumer profiles.

[346] This cost includes taxes, levies and certificate schemes.

[347] This tax is effective since January 1st, 2021, but it was not included in the previous version of this report, thus explaining the difference with 2021.

KEY FINDINGS

The first industrial natural gas profile (G0) analysis leads to the following findings:

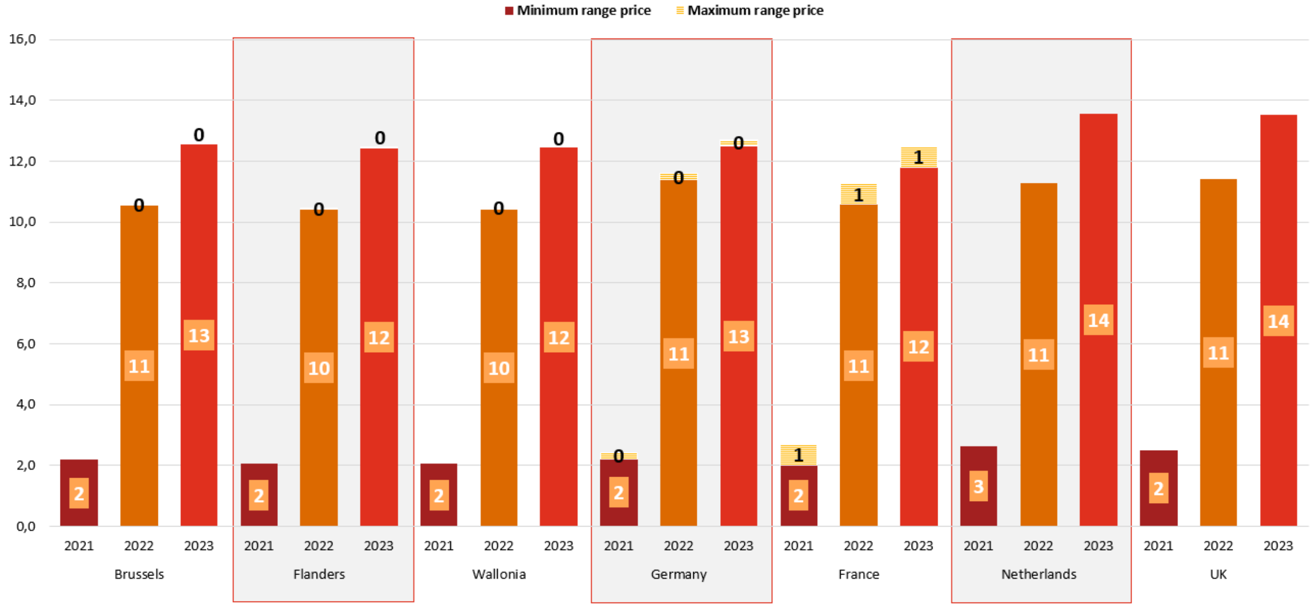
- Like the smaller profiles (G-RES and G-PRO) and last year's results the Netherlands is still the most expensive country regarding natural gas. This is mainly due to the large amount of taxes regarding natural gas that have increased further compared to last year (43,79 to 47,69 EUR/MWh).
- Flanders and Germany (due to the capping mechanism) are the cheapest and second cheapest regions overall. If all reductions applied, France however becomes the cheapest country for that profile. Wallonia and Brussels are marginally more expensive than Flanders and remain among the cheapest regions in scope.
- The **commodity component** is the cheapest in Germany due to the capping. France comes next, followed by the UK. The commodity component is the second highest in Belgium, after the Netherlands, but is compensated on the final invoice by the low all other cost component.
- The **network cost component** for this profile is by far the highest in the UK, followed by Germany. Once again, the UK is handicapped by higher electricity distribution and transmission costs. Belgium is the country with the lowest network costs, Flanders being the cheapest region, followed by Brussels and finally Wallonia.
- The **all other cost component** is still a very large component in the Netherlands and makes them the least competitive country. Furthermore, it is important to note that the price per MWh remains the same between G-PRO and G0 in the Netherlands. While there is now a range for Germany and France, we see that only the possible reduction in France can change the competitive position of the regions/countries. The regional differences regarding this component are losing importance in Belgium compared to the G-PRO profile.

Profile G1 (Natural gas)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by an industrial G1 profile in the different studied countries and regions. The results are expressed in MEUR/year. The second figure gives the Belgian average natural gas invoice, presenting the percentual price differences with other countries.

Figure 81: Total yearly invoice in MEUR/year for industrial consumers (profile G1)



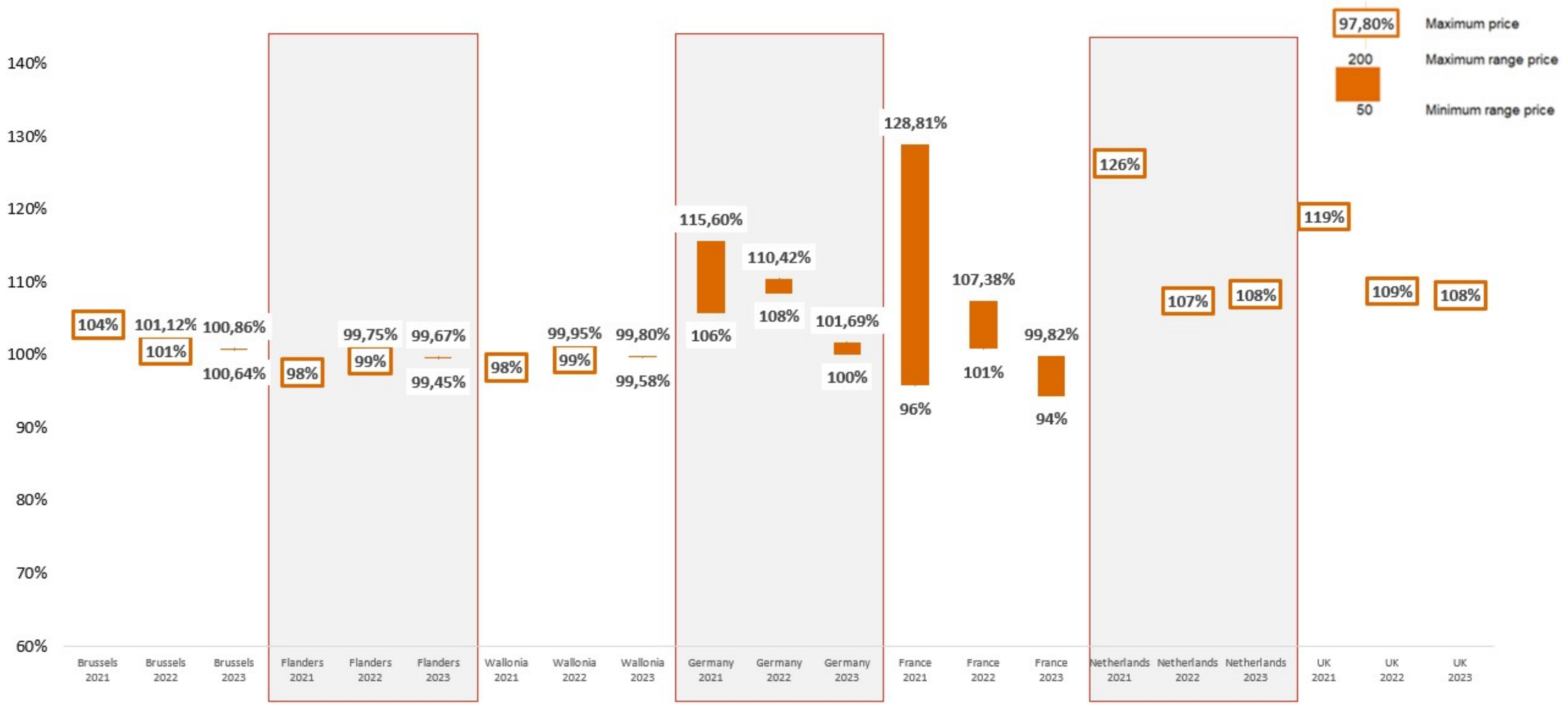
For G1 profiles there is again an increase in total invoice for all countries and regions in 2023. France is the cheapest country when reductions are applied, Belgium second and Germany third. In Belgium Flanders is the cheapest region. Brussels remains the most expensive of the three regions. The Netherlands again is the most expensive country, closely followed by the UK.

As stated in Section 5, for profiles G1 and G2 in the three Belgian regions, we show a price range, due to the possible exemption of the federal excise duty. Therefore, the minimum price shown is the one taking the full exemption into account, while the maximum is including the full cost of this federal cost for these two profiles[348]. The Belgian average used in the following figures for G1 and G2, considers both the minimum and the maximum, as done for the industrial electricity profiles.

[348] According to Art. 429.§ 1er of the law from 27th December 2004[348] an exemption is foreseen when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures, thus being considered as “double usage”. For the sake of this report, we assumed that profiles G1 and G2 could potentially benefit from this exemption, if they fall within the conditions specified by the law.

Below, we compare each region and country's yearly bill with the average Belgian price, which is set at 100. The Belgian average is computed as the mean value from each region's yearly bill and since the figure has the results of 2020 to 2022, we take the average of their respective year into account.

Figure 82: Total yearly invoice comparison in % (profile G1; Belgium average = 100)



Like the analysis for G0 we observe that the competitive position of Belgium keeps deteriorating compared to 2021 and 2022. We observe a convergence towards the Belgian average for all countries under review, being 1% to 8% more expensive than Belgium, due to the general increase of the commodity price. As stated above, there is now a price range for the three Belgian regions. When this profile is exempted from the Federal excise duty, the Belgian competitiveness improves even more compared to the other countries.

Breakdown by component

The previous results are further detailed for profile G1 in the figure underneath, which provides a closer look at the breakdown of the different price components.

Figure 83: Natural gas price by component in EUR/MWh (profile G1)

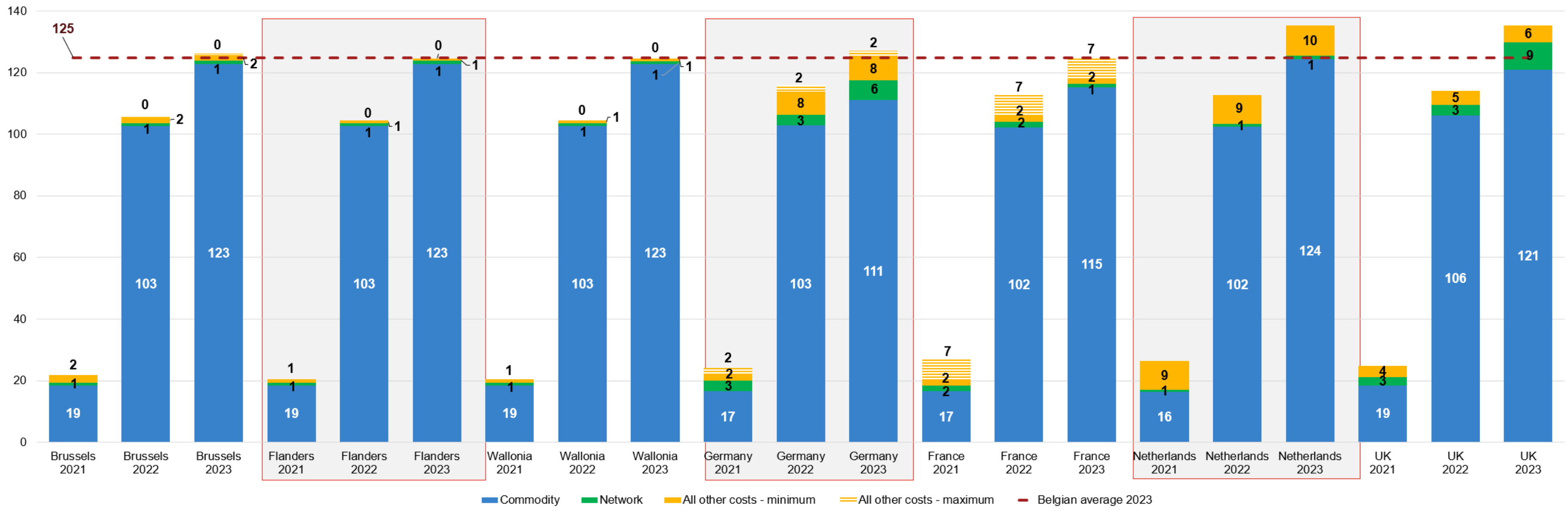
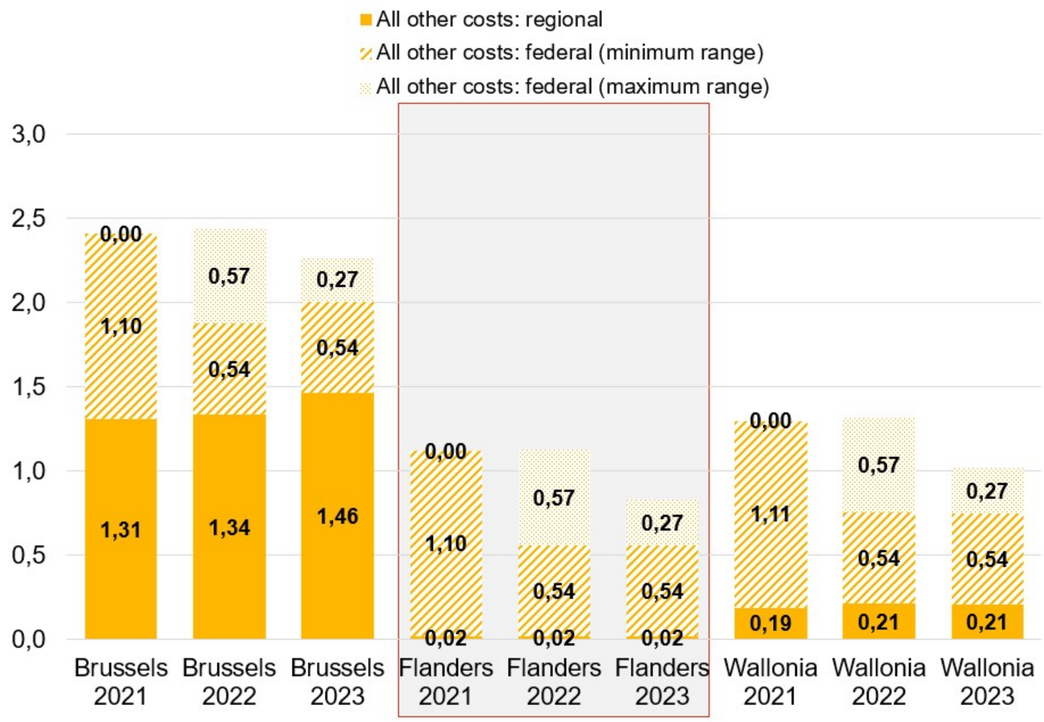


Figure 84: Natural gas price by component in EUR/MWh (profile G1)



The importance of the **commodity component** has increased even further compared to the G0 profile. The commodity component costs are almost aligned in the 115,32-124,30 EUR price range between all the regions and countries reviewed. Germany is the only country with slightly lower commodity price, due to the capping mechanism applied.

Regarding the **network costs**[349] we see in Belgium that Wallonia has the lowest network cost of the three regions, followed closely by Flanders. On the other hand, the UK and Germany do have the highest network costs. The increase of the network costs in the UK can once again be explained by higher electricity distribution and transmission costs in the recent months.[350] Germany is the country with second the highest network costs, which have almost doubled (6,46 EUR/MWh) since last year. The UK has the highest network costs (8,95EUR/MWh). Network costs in France dropped to 0,97 EUR/MWh, which makes it the second cheapest country/region for this.

The **all other costs component**[351] has vastly decreased in the Netherlands compared to the G0 profile, but it is still significantly higher than in other countries. In France, the reduction on the TICGN still plays an important role in the overall positioning of the country compared to the other regions/countries. In Belgium, the distinction between federal and regional all other costs component makes it clear that the regional cost is almost non-existent in Flanders and Wallonia while in Brussels this cost is still greater than the federal all other costs component. The possibility for G1 profile to be exempted by the federal excise duty can help the competitiveness of the Belgian regions. In Germany, the introduction of the "*CO2 Steuer*", or carbon tax, (5,461 EUR/MWh) is the main responsible for the large increase of the all other costs component compared to 2021[352].

[349] An adjustment has been made in this 2022 update to the network costs of 2020 and 2021 for Brussels, Wallonia and Flanders G1 profile due to a miscalculation in the commodity fee component.

[350] Source: https://bionic.co.uk/blog/noticed-energy-prices-have-fallen-over-past-few-months/

[351] This cost includes taxes, levies and certificate schemes.

[352] This tax is effective since January 1st, 2021, but it was not included in the previous version of this report, thus explaining the difference with 2021.

KEY FINDINGS

The second industrial natural gas profile (G1) analysis leads to the following findings:

- Compared to last year, the total invoices have again increased in all regions/countries and this is mainly due to higher commodity costs.
- Flanders is the cheapest region in 2023, followed closely by Wallonia and Brussels. However, when all reductions applied, France becomes the most affordable country for this profile, ahead of Belgium and Germany. The UK and the Netherlands are the most expensive countries for that profile, with very similar total prices (but with a different split). Overall, this year we observe a convergence of the total gas bill among the regions/countries under review due to the similarity of the commodity component in all regions/countries, with rather small differences between them.
- The **commodity cost** has increased again compared to 2022, though in a less extreme way than from 2021 to 2022. Germany and France show the cheapest commodity price, followed by the UK and then Belgium. The Netherlands is the most expensive country here.
- The **network cost** is almost unchanged in Belgium, but it is still lower than the levels of the most expensive regions, Germany, and the UK. The highest increase compared to 2021 is observed in the UK, due to higher electricity distribution and transmission costs.
- Lastly, the **all other costs component** is very important regarding the competitive position of the region/country. In the Netherlands there is a big decrease compared to the G0 profile, but it is still the country among the ones reviewed in which the all other costs component is the highest.

Profile G2 (Natural gas)

Total invoice analysis

The figure below provides a comparison of the total yearly invoice paid by an industrial G2 profile in the different studied countries and regions. The results are expressed in MEUR/year. The second figure gives the Belgian average natural gas invoice, with the aim of presenting the percentual price differences with other countries.

Figure 85: Total yearly invoice in MEUR/year for industrial consumers (profile G2)

The G2 profile is the largest natural gas consumer under review and the first observation is that every region/country has a price range for this profile. The range in Belgium is the result of a possible exemption on the energy contribution for feedstock consumers and of the special excise duty. In the UK the G2 profile can benefit from an exemption from the climate change levy which is why they also have a range. Lastly, we have the Netherlands that always had the highest all other costs component that offers an exemption of the energy tax.

Now that every region/country has potential reductions and/or exemptions to consider the competitiveness of a region/country is more ambiguous since it depends on the profile of the consumer. This becomes clear in the figure below (figure 86). This figure takes the Belgian average as a base and compares the total invoice of the neighbouring countries with the Belgian average. As we have done with all the previous profiles, the 2021 results are set out against the 2021 Belgian average and the same logic applies to 2022 and 2023.

Figure 86: Total yearly invoice comparison in % (profile G2; Belgium average = 100)

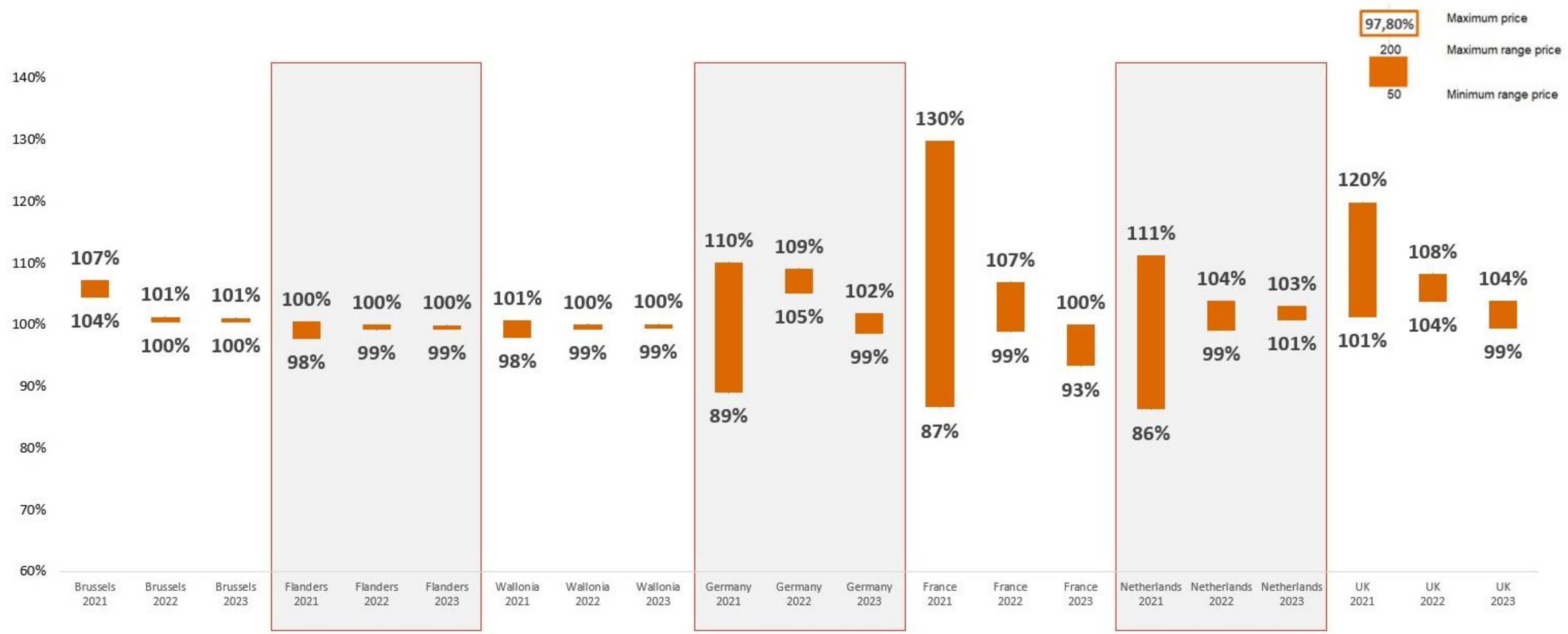


Figure 86 shows that France, Germany and the UK have the possibility to be cheaper than the Belgian average. Furthermore, we also note that the range in France is rather large for the G2 profile. Lastly, we observe that once again the Netherlands is the most expensive country under review for natural gas. Overall, we notice that there is a clear convergence between the regions/countries under review, due to the increase of the commodity cost, similarly to what we concluded for the other industrial profiles.

Breakdown by component

The previous results are further detailed for profile G2 in the underneath figure, which provides a closer look at the breakdown of the different price components.

Figure 87: Natural gas price by component in EUR/MWh (profile G2)

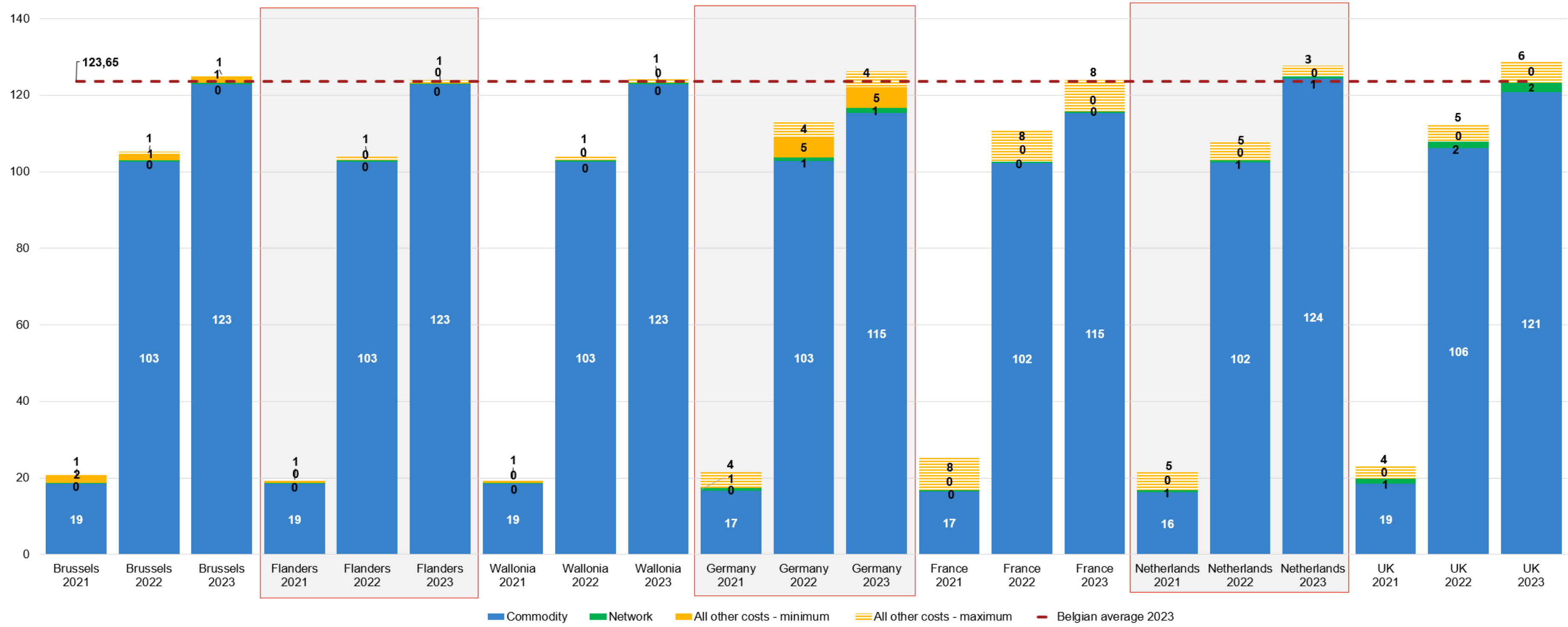
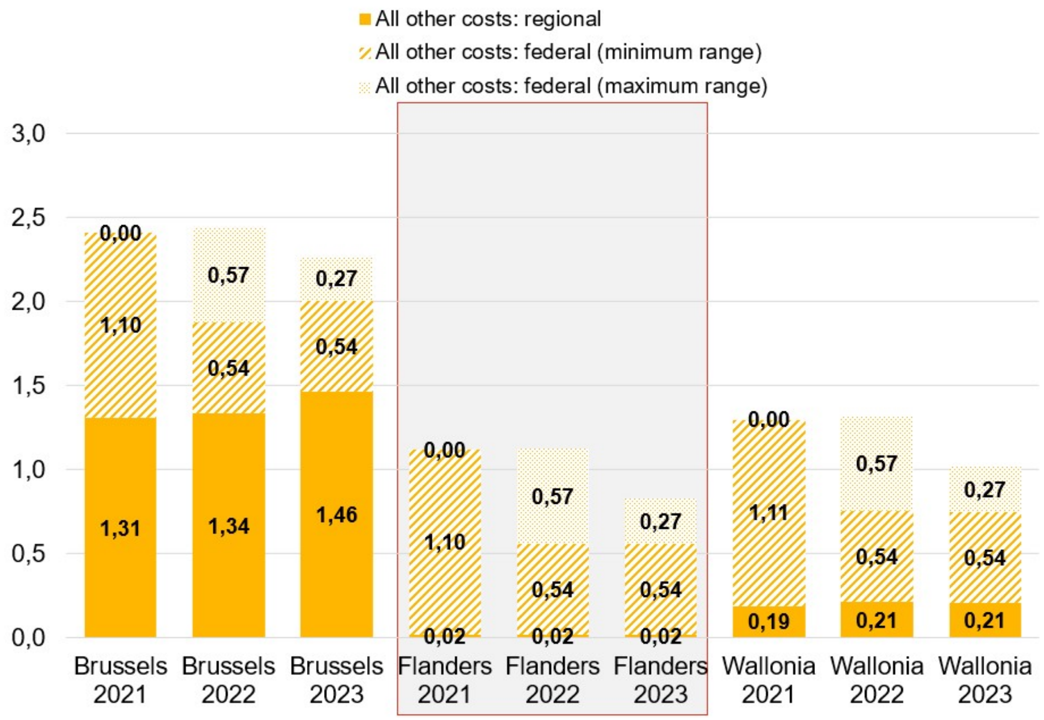


Figure 88: Natural gas price by component in EUR/MWh (profile G2)



The figure with the breakdown per component clearly shows that the **commodity component**[353] makes up most of the total invoice, more than 90% in all regions/countries under review. Once again, the commodity price is rather similar from one region to another except for France and Germany which have slightly lower commodity costs.

When comparing the different components in EUR/MWh we observe that the **network cost** is almost negligible, and the UK has the highest cost with 2,46 EUR/MWh.

Lastly, the **all other costs component**[354] still plays a big role in defining the competitiveness of the regions/countries, in whether the reduction(s) applies or not. When the reduction applies this component becomes negligible in every region/country except Brussels where it still has a role to play (1,28 EUR/MWh). Like for the G1 profile, we introduced this year the possible exemption for G2 profile with regards to the federal excise duty[355]. When this is applied, the overall Belgian competitiveness is even improved, with Flanders and Wallonia only having a small regional part.

[353] The large increase of the commodity component in Belgium compared to 2020 is the result of the adapted methodology that takes the natural gas price of January which is inconsistent with the yearly average. The methodology behind the natural gas commodity price will be updated next year as detailed in Chapter 5: Large industrial consumers.

[354] This cost includes taxes, levies and certificate schemes.

[355] According to Art. 429.§ 1er of the law from 27th December 2004[355] an exemption is foreseen when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures, thus being considered as "double usage". For the sake of this report, we assumed that profiles G1 and G2 could potentially benefit from this exemption, if they fall within the conditions specified by the law.

KEY FINDINGS

The biggest industrial natural gas profile (G2) analysis leads to the following findings:

- In 2023, no region stands as clearly and consistently more competitive than the others. The competitiveness clearly depends on the possible reductions applied in each country/region. Overall, we observe a convergence between regions/countries due to the high commodity prices.
- The **commodity cost** had an impact on the competitive position of the regions/countries under review. Since this component becomes more and more important as the consumption augments and since France and Germany have the lowest commodity costs, they have a small advantage regarding this component. This also improves France’s overall positioning. Conversely, the higher commodity cost in the Netherlands has a negative impact on its competitive position.
- Overall, the **network cost component** no longer has a significant impact on the strategic positioning of a region/country for the G2 profile. The UK has the highest network cost, followed by Germany.
- The **all other costs component** shows large variations that will impact the competitive position of all regions/countries. Germany sees his competitiveness deteriorate due to the introduction of the carbon tax, which accounts for half of the all other costs component in 2023.

7. Energy prices: Conclusions

7. Energy prices: Conclusions

Electricity

Residential and small professional consumers

(1) For most of the regions and countries under review, the increase in the commodity cost is a common denominator to the situation of 2022 (except for all regions in Belgium, as well as all except Tennet in Germany). All the countries' governments under review have partially limited this increase for the E-RES profile thanks to energy price caps, government refunds, temporary lower VAT rates or by offering a regulated product at lower price. This is also true for the E-SSME profile in France, the UK, the Netherlands and Germany, with the Netherlands and Germany being the latest to have the introduction of price caps in 2023, to alleviate the cost of increasing commodity costs on the end-consumers. In the Netherlands, the government tax refund scheme has been decreased while on the other hand a price cap has been set. This strategy change does partially compensate for the increase of the commodity price for this profile, but not in full – which is why it is for E-RES the less competitive country observed. We don't notice a convergence, unlike last year, for the E-BSME profile since we used the commodity market prices which are this year, not similar across the regions/countries. Indeed, the UK and France have very high commodity costs, while the Netherlands and Belgium are alike, with Germany presenting the lowest commodity costs.

(2) The three regions in Belgium are aligned with most of the other countries for the E-RES, E-SSME and E-BSME profile. Belgium is the second cheapest country for all residential and small professional profiles. In Germany, Tennet, which is the cheapest German region is at par with the UK for the E-RES profile. Germany as a whole is the second more expensive country for E-SSME and E-RES profiles, while it is the most competitive on the E-BSME spectrum. Flanders is the most competitive Belgian region for E-SSME because of the lower regional all other costs and lower network costs, while Wallonia and Brussels are the cheapest for the E-BSME profile. Wallonia is the most expensive region for all the residential and small professional profiles (except E-BSME), and this is mainly because of their higher network and all other costs.

(3) To compare the profiles, it is best to look at the EUR/MWh and then it becomes clear that small professional consumers usually pay less than residential consumers per MWh of electricity. The reason for this is twofold, first the impact of the VAT. We take the assumption that VAT is deductible for professional profiles and since this amounts to 21% of the total invoice in the Netherlands this year, there it makes a difference when we remove this component. When removing the VAT component, it appears that E-RES and E-SSME are quite close per MWh. Secondly some tariffs depend on connection levels which is why we see a difference between E-RES and E-SSME on one hand and E-BSME on the other hand. Additionally, we can state that the commodity, network and all other costs all tend to decrease for larger consumers.

Industrial consumers

(1) The commodity cost is a very important component for the industrial profiles even more so for the larger industrial consumers where reduction and/or exemptions are applied on network and all other costs. Like for residential and small professional profiles, the commodity is the component that increased the most in all countries compared to previous year for industrial consumers, with a cross-country average of 80%, with increases going up to 107% for the UK. Compared to the increase for residential profiles which faced a commodity cost stagnating or slightly increasing, this makes the overall bill proportionally higher. The commodity cost often makes up more than 70% of the total invoice except for Germany that has big ranges for all other costs component and important network costs. For all regions/countries under review, the commodity costs accounts for a larger share of the total energy bill than in 2022, which already increased from 2021. The general increase of the commodity price explains the partly converging trend between the regions/countries under review in terms of total costs. Germany has the lowest commodity cost due to the price cap in place this year (for E0, E1 and E2 profiles), while the UK has the highest. The commodity cost remains the same from E0 to E2, but changes for E3 and E4 since we assume that these profiles consume 24/7. These larger industrial profiles see France showing the lowest commodity costs, due to the ARENH mechanism in place.

(2) The reductions and exemptions on network and all other costs greatly vary between regions/countries and profiles and have an important impact on the competitiveness of the regions/countries. These reductions are especially important in Germany, which is the most competitive from E0 to E2 when consumers need to pay the maximum amounts. France become the most competitive when consumers need to pay the full price. Flanders also offers reductions starting with E0, which significantly improves the competitive position of the region, or at least decreases the gap with other regions/countries that offer large(r) reductions, such as Germany (all profiles) or the Netherlands (E0 and E1 profiles). There is also a clear distinction between electro- and non-electro-intensive consumers. Numerous regions/countries (Flanders, France, Germany and the Netherlands) have designed a mechanism to support electro-intensive consumers by offering lower fares, the cheapest being France and the Netherlands. Compared to last year, the new federal excise duty allows to provide an exemption for profiles E1 to E4 to the three Belgian regions. Therefore, we notice a price range with regards to the all other costs also for Brussels and Wallonia in 2023, enabling the last two regions to be only slightly more expensive than France and the Netherlands for smaller industrial profiles.

(3) Looking at the competitiveness of the Belgian regions, we observe that when all reductions apply for electro-intensive consumers, Flanders is the most competitive region within the country. When comparing electro-intensive consumers across countries, we see that the most competitive regions are those of Germany for profiles E0 to E2, which changes to France being the most competitive for the largest industrial consumers, E3 and E4 profiles. The fact that Brussels and Wallonia are less competitive for electro-intensive consumers is be explained by the small all other costs components range, compared to the most competitive regions, namely France and the Netherlands. However, this is not the only factor, certainly for the very large profiles (E3 and E4) where the commodity component plays for the majority on the bill. When comparing the total invoices for the non-electro-intensive consumers, Belgium's competitiveness is at par with Germany and the Netherlands, while France tends to always be cheaper.

(4) The UK is an outlier for all the industrial profiles and the bigger the profile the more the difference between the UK and the other regions/countries is accentuated. They always display higher prices and while they are sometimes slightly competitive for the smaller industrial profiles if we take non-electro-intensive profiles into account, this is no longer the case for the bigger profiles. This is even more evident in 2023 compared to 2022 as the electricity price more than doubled two years in a row in the UK, while it increased by a slightly smaller rate in the other regions/countries under review.

Summary

The figure below depicts the global trend followed by yearly electricity bills once considered across all countries and regions simultaneously. In the following figure, solid lines may represent three different kinds of prices depending on countries: a unique price (e.g. the UK), a maximum price due to a range of possibilities in network and/or tax prices (e.g. France for residential and small professional consumers) or a maximum price for non-electro-intensive consumers - from profile E0. Dotted lines symbolise maximum prices for electro-intensive consumers (from profile E0) whereas dashed lines are minimum prices.

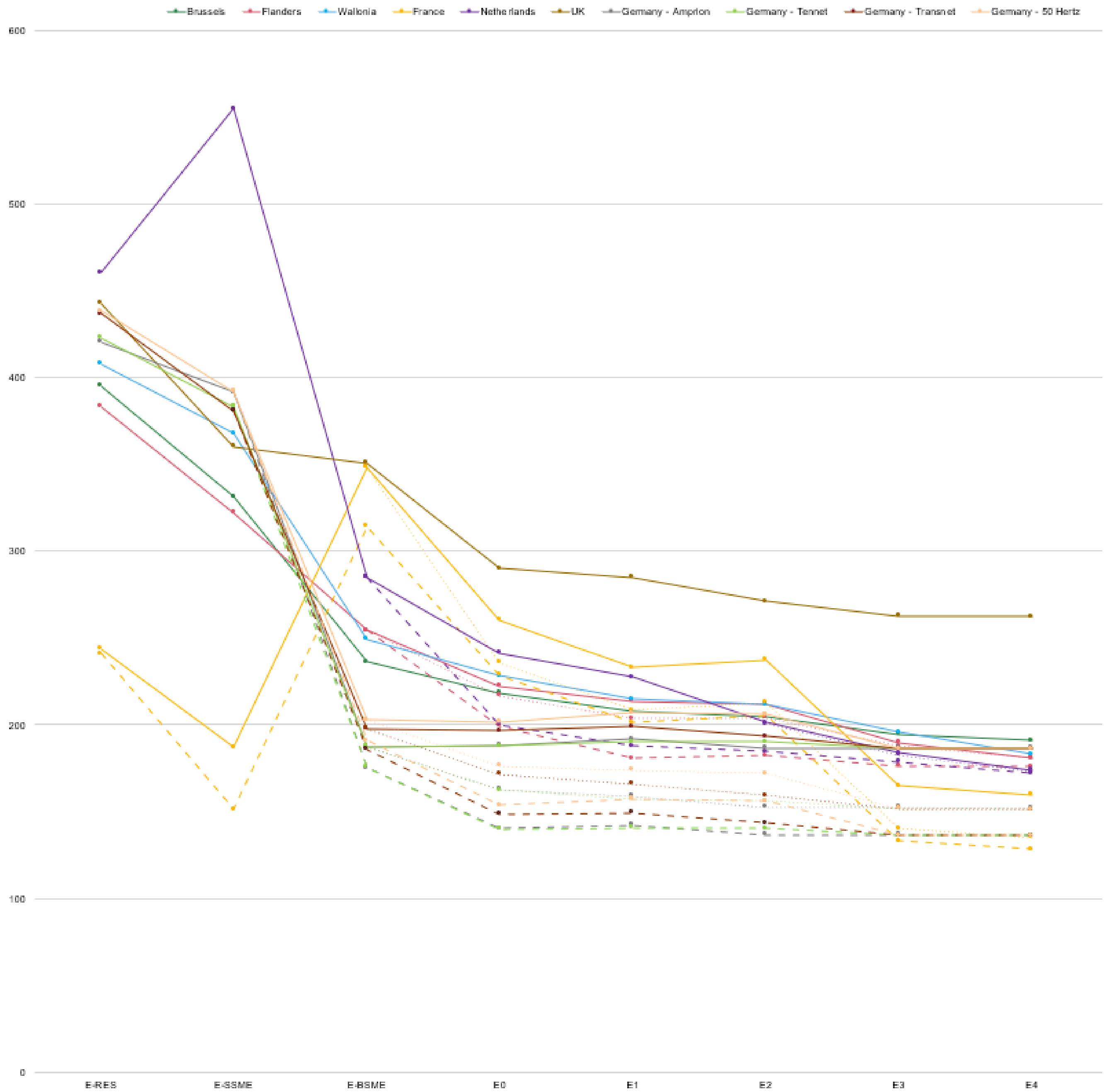
Regarding residential consumers E-RES and E-SSME, all regions/countries, except for the Netherlands, see their energy bill declining compared to last year, which is mainly explained by the measures taken by each individual country such as VAT cuts, price caps, compensation of the increase of the commodity cost, etc. The difference in electricity costs between E-RES and E-SSME on the one hand and the larger profile on the other hand are decreasing in 2023, as E-BSME and above profiles see their bill increase more than small consumers (especially in France, the Netherlands and the UK). Thirdly, due to the general increase of the commodity price and the number of measures taken, compared to last year we observe a less pronounced convergence of the electricity bill between the regions/countries under review, in particular for small industrial consumers. The variance is higher for industrial profiles than in 2022.

The general decreasing trend seems to indicate that, in all countries, governments have chosen to allocate electricity consumption costs differently depending on the profile: the smaller the profile, the higher the price per unit of electricity consumed. The only exceptions lie in the Netherlands E-SSME profile whose fares are higher than residential consumers E-RES and in France, the E-BSME profile being more expensive than E-SSME while the E2 profile is more expensive than the E1 profile. This reflects a cost burden transfer from large consumers to small consumers but is also related to the network that the consumer is connected to. The higher the connection level of the consumer the lower the network cost.

The taxing mechanisms, as identified by the splitting of lines (i.e. multiple pricing possibilities) from profile E0, designed to support electro-intensive consumers also indicate a transfer of electricity costs from electro-intensive consumers to non-electro-intensive consumers as the former face much higher fares. Overall, France is the only country to differentiate all profiles as prices differ on selected pricing options as of consumer E-RES, while most regions applying this differentiation do it as from the E-SSME or E-BSME profiles.

When looking at Belgium we do see a difference in the price (total energy bill in EUR/MWh) evolution for the residential and small professional profiles. The price steadily decreases from E-RES to E-SSME in all Belgian regions. For all three regions the price decreases much more between E-SSME and E-BSME. This happens mainly because the E-BSME profile is connected to a higher voltage level than E-SSME, from LS to MS, and the higher the voltage level the lower network costs, commodity costs and all other costs.

Figure 89: Electricity yearly bill in EUR/MWh per profile



Natural gas

Residential and small professional consumers

(1) Compared to 2022, the most significant difference in the gas bill for residential consumers is the slight decrease of the commodity price in all the regions/countries under review except France and the UK, as well as the reductions in VAT and price cap mechanisms installed. In addition, the commodity cost is also important for natural gas consumers, accounting in the Belgian regions in 2023 for more than 74% of the total bill for G-RES and more than 87% for G-PRO. The role of the other costs component is also quite similar between regions/countries, between 1% to 8% of the total invoice, except for the Netherlands, where it makes up a third of the total invoice. In Belgium, Flanders is the most competitive region followed by Brussels and the regional all other costs play a role in this, similarly to the previous year. We also see that the Netherlands is by far the most expensive country, mainly because of their all other costs.

(2) There are some regional differences in Belgium that have an impact on the competitiveness of the Belgian regions compared to each other, but also when comparing to the other countries under review. Belgium is the most competitive country for G-RES, and the second most competitive for G-PRO. When looking at G-PRO, we see that Flanders and Germany are the two most competitive regions while Wallonia is in fifth place after France and the Brussels. The regional differences are the result of larger network and regional all other costs in Wallonia.

(3) To further compare the two residential and small professional consumers, we must look at the price they pay per MWh. We see that the professional consumers pay less per MWh, except in the UK and France. The reason behind this is firstly the absence of VAT for the professional consumers. Secondly, we also see that the commodity and network cost is also less per MWh for professional consumers.

Industrial consumers

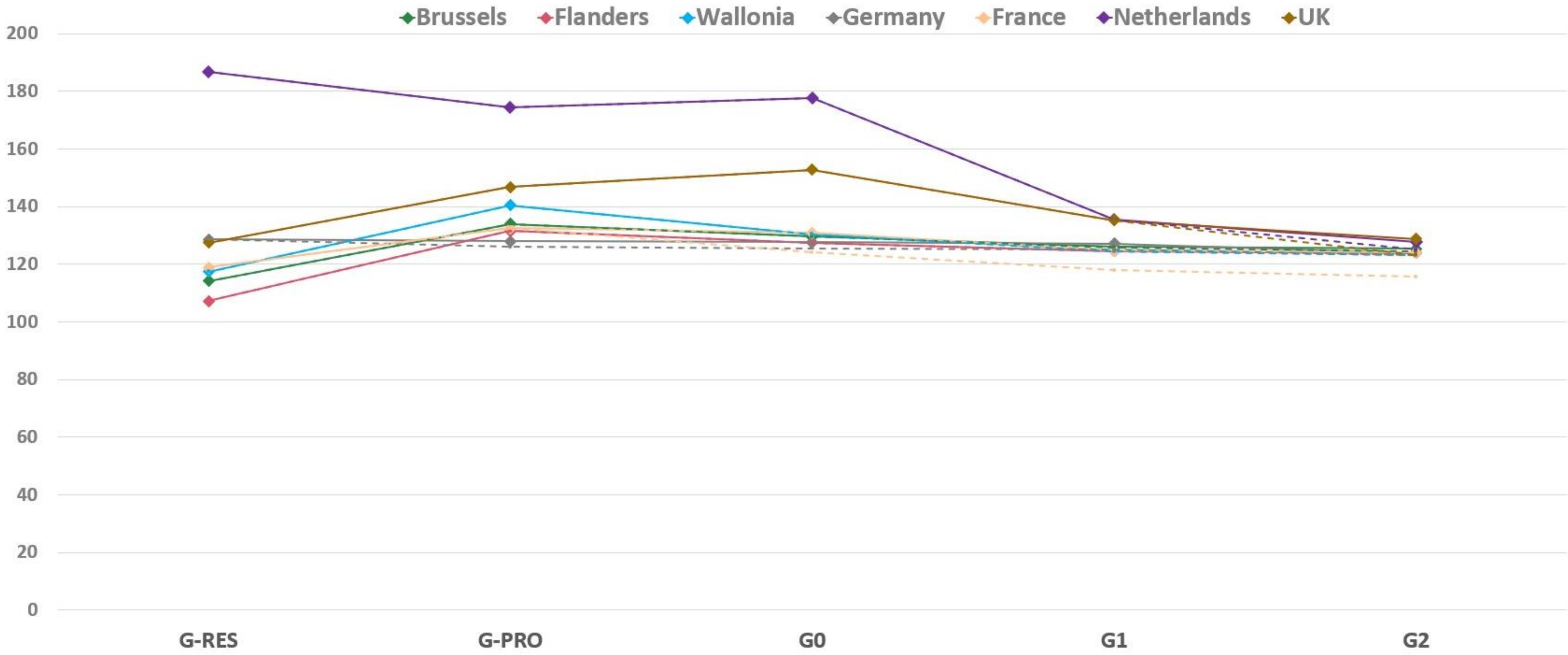
(1) Like the residential profiles the commodity component is also very important for industrial natural gas consumers and the bigger the profile the more that the total invoice is determined by the commodity component. Industrial natural gas consumers again saw an increase in the commodity cost compared to 2022, in all regions/countries under review except for Germany (G0). In Belgium, the difference between the regions is smaller than it was for electricity. Flanders is the least expensive region in Belgium for all the industrial profiles. In the Netherlands, the all other costs component constitutes around 30% of the invoice for G0, but this cost undergoes a serious decrease when looking at the G1 and G2 profiles.

(2) The differences between the G0, G1 and G2 profiles are very small: there is quite some variation regarding the competitiveness of the regions, while Belgium is still competitive for the smaller profiles G0 and G1, France is more competitive for G2. The application of the ranges of the all other costs will be very important in determining the competitiveness of the region.

Summary

Similarly, to electricity the figure below depicts the global trend followed by natural gas yearly bills once considered across all countries and regions simultaneously. Solid lines represent unique or maximum prices, whereas dashed lines constitute minimum prices.

Figure 90: Natural gas yearly bill in EUR/MWh per profile



Again, an overall decreasing trend can be observed, implying a bigger natural gas cost burden for small consumers compared to large consumers: the smaller the profile, the higher the cost per unit of natural gas consumed. However, we still notice some exceptions. In the Netherlands the G0 profile pays a higher fare than G-PRO, while France the G-PRO profile pays more than G-RES. All countries offer reductions and/or exemptions for profile G2: if less clear than for electricity, consumers not benefitting from these reductions and exemptions may bear the financial costs to ensure lower prices for consumers eligible to these reductions and exemptions (i.e. feedstock consumers) – yet in a less pronounced fashion. Germany is the only country to offer different pricing options for all professional consumers, while France starts from G0 profile onwards and Belgium allows as of 2022 the G1 and G2 profiles to be exempted from the federal excise duty, even if this is not visible in the figure above as impacting very little on the EUR/MWh figures overall.

Competitiveness score

Throughout this report, we addressed complex situations with a lot of nuances that we intend to present in a simplified manner. For this reason, we have drawn up competitiveness scorecards that give a clearer representation of how competitive Belgium/Brussels/Flanders/Wallonia is, regarding a certain profile, compared to neighbouring countries/regions.

Methodology

Results presented in this section were derived following two approaches: a national and a regional approach. The first method (national) compares figures obtained for Belgium with the other four countries from our study, namely Germany, France, the Netherlands and the UK. Belgian values were estimated by using the arithmetic average of all three Belgian regions. The second approach (regional) compares each Belgian region with the foreign regions and countries. While this leads Belgian regions to be compared with the same four countries previously mentioned for natural gas, seven countries and regions are used when it comes to electricity: Amprion (Germany), Tennet (Germany), Transnet BW (Germany), 50 Hertz (Germany), France, the Netherlands and the UK.

Electricity

Residential and small professional consumers

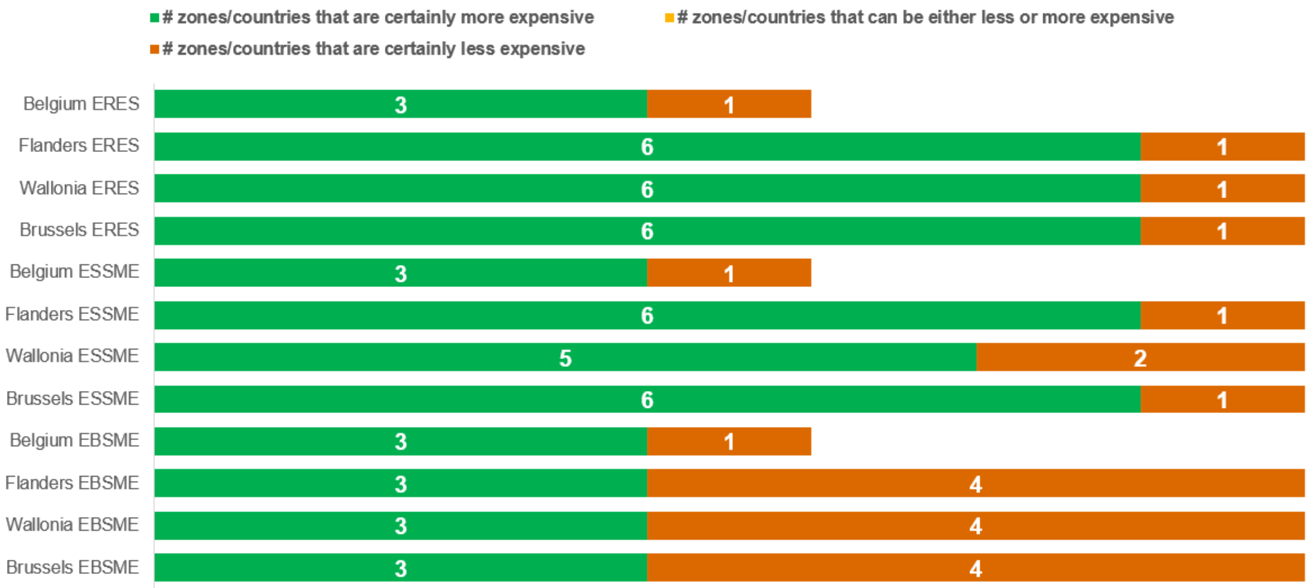
Firstly, we discuss the competitive position of the regions/countries for residential and small professional consumers under review. Before going more in-depth, we can already note that for the residential and small professional profiles the competitiveness of a region/country is clearly identifiable and does not depend on certain qualifications of the consumers as it can be seen under the industrial profiles.

On the national level, Belgium is very much competitive regarding the E-RES and E-SSME profiles, as only France is less expensive in E-RES and E-SSME profiles (because of lower commodity costs). As we move to the E-BSME profile, the competitiveness decreases for the individual regions, though Belgium remains as competitive as for smaller residential profiles. Belgium becomes second to Germany for this profile, while at the same time having lower all other costs in all three regions help Belgium’s average bill getting smaller than almost all the other regions under review. Germany has the advantage of a very low commodity price due to the price cap introduced this year, though it still has a relatively high all other costs component.

On the regional level, the prices are in the same range, though Flanders is the cheapest Belgian region for E-RES and E-SSME due to lower commodity, while Brussels is the cheapest for the E-BSME profile due to lower all other costs. Flanders’ high all other costs make them the least competitive in Belgium regarding E-BSME.

Compared to 2022, Flanders, Wallonia and Brussels have become more competitive for E-RES. The situation for the three regions in the E-SSME has improved, while the competitiveness of the regions has decreased for E-BSME profiles. The only change is that the whole Germany country has become less expensive than all three regions of Belgium for E-BSME in 2023, which was not the case in 2022.

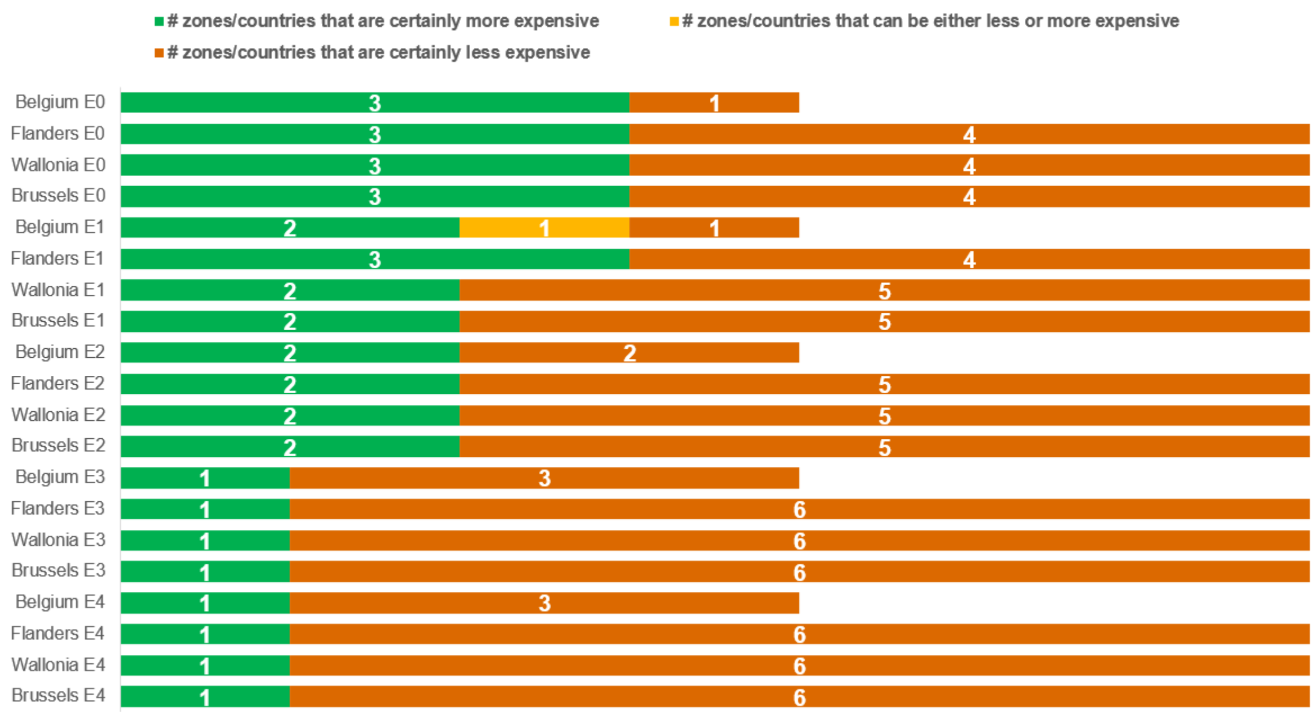
Figure 91: Competitiveness scorecard for residential and small professional electricity consumers (profile E-RES, E-SSME and E-BSME)



Large industrial consumers

Hereunder, we have set out the scorecards for every industrial profile (profiles E0 to E4), which gives an overall overview but also a specific one for electro- and non-electro-intensive consumers. The competitive position is more complex to grasp for our industrial profiles, compared to the residential and small professional profiles, the competitiveness of a region/country cannot always be determined in a binary approach (certainly less or more expensive). Comparing the scorecards of the industrial profiles we see that the complexity mainly stems from the electro-intensive consumers where there are different reductions to consider.

Figure 92: Competitiveness scorecard for industrial electricity consumers (profiles E0 – E4)



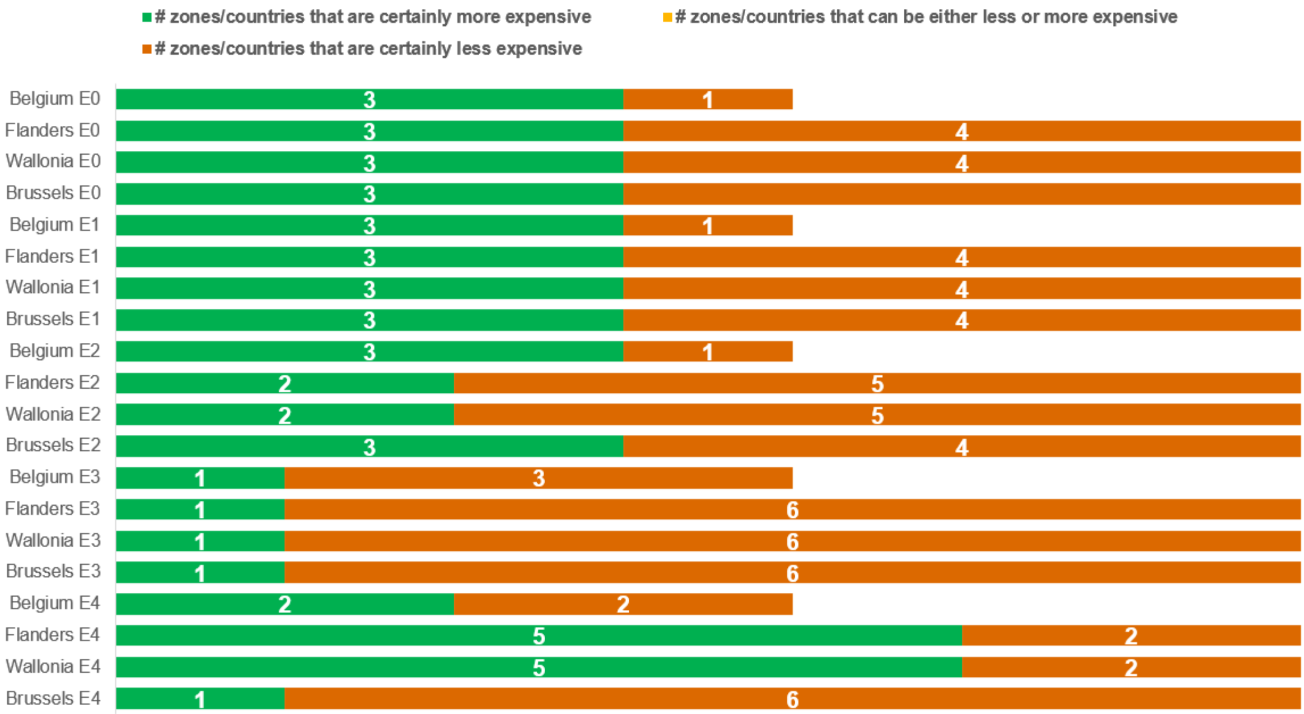
Before going into detail of the first figure, we note that Belgium as a whole and each of its regions are always cheaper than the UK. Another general observation we can make is that starting E0 Germany is less expensive than Belgium. Apart from these two statements, the competitive position of Belgium and its regions is very ambiguous for all the profiles. Regarding E0, E1 and E2 profiles, the position of Belgium remains stable while we observe some changes on the regional level.

Given the large number of countries/regions that can be either less or more expensive, it is difficult to draw conclusions based on the previous figure: therefore, we also present scorecards that detail the competitive position of Belgium and its regions for non-electro-intensive and electro-intensive consumers. We firstly analyse the competitive situation for the non-electro-intensive consumers.

Since there are no ranges for non-electro-intensive consumers, the competitive position of each region and country is much clearer. Belgium and all its regions are very competitive regarding non-electro-intensive consumer, except for the E3 profile where some uncertainty occurs. On the national level we see that for all the profiles there is always at least one country that is certainly less expensive, this is Germany (except for the E4 profile). France and the Netherlands are less expensive than Belgium for the E3 and 34 profiles only. Knowing this, the figure below is easy to read, Belgium and all its regions are always cheaper than the UK, and the four German regions are almost always cheaper than Belgium and its regions.

When comparing the scorecard on industrial non-electro intensive consumers from 2023 with the one from last year we notice that the competitive position of Belgium and its regions changed. For E3, we notice that the competitiveness of Belgium and its regions deteriorate compared to 2022 due to the general increase of the commodity price which led to a slight convergence between the regions/countries under review, and a strong strategy of price cap in Germany, therefore making its regions cheaper at once. For this profile, there are more countries than last year which can be less expensive than Belgium and its regions.

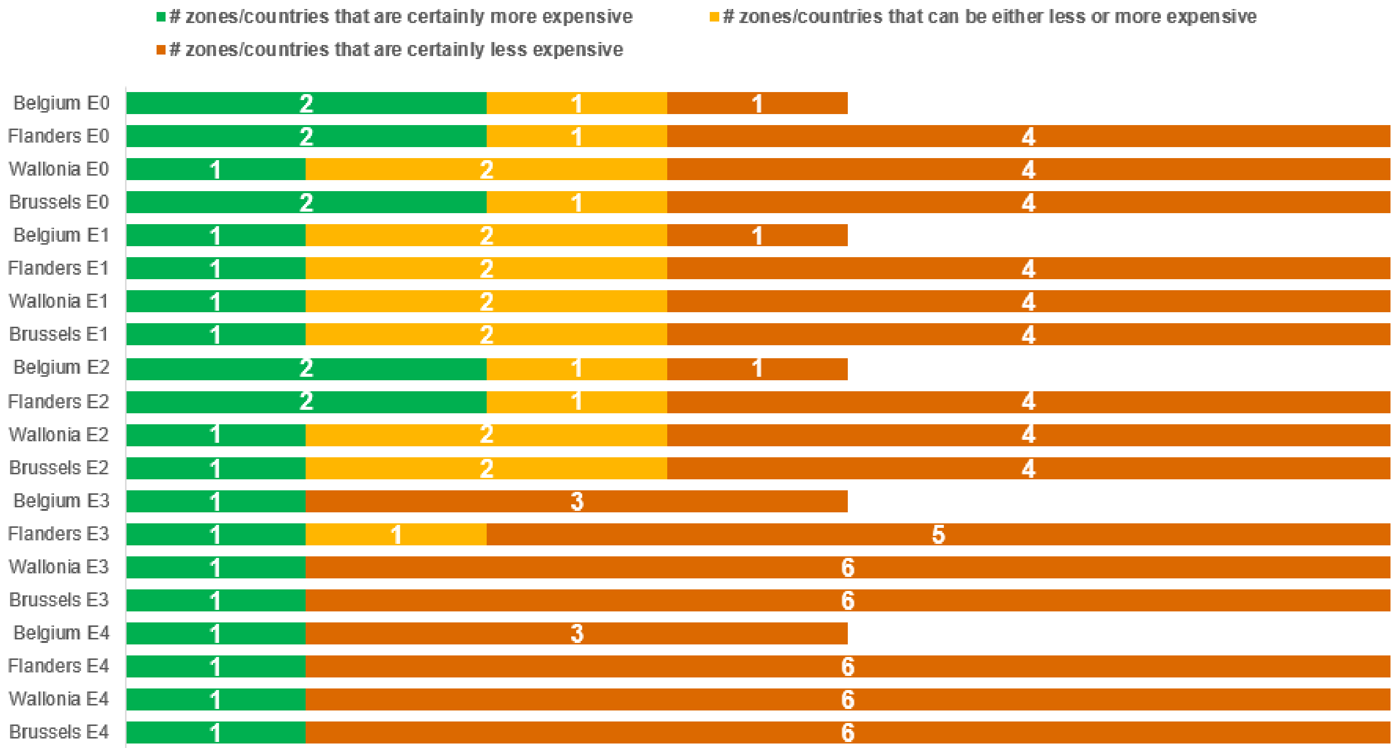
Figure 93: Competitiveness scorecard for industrial non-electro-intensive consumers (profiles E0 – E4)



As we noted before, the complexity and ambiguity of the competitive position of Belgium and its regions is mainly because of the potential reductions for electro-intensive consumers. Compared to the second scorecard, the following chart makes it easier to see the regional differences. The country that is certainly more expensive is the UK, similar to the general scorecards. Regarding Germany, it is always less expensive than Belgium, and the same goes for all the other countries, depending on the price reductions, until the E3 profile where a shift occurs and France and the Netherlands become much more competitive, overtaking Germany as the cheapest on the market. The Netherlands is cheaper for E2-E4, and France for E3-E4. Within Belgium, we notice that the competitive position of Flanders and Brussels regarding electro-intensive consumers are better than Wallonia in the country. In fact, for most profiles, Flanders and Brussels have competitive prices, and in some instances uncertainty regarding their competitive position, due to the elector-intensity range. We also note that the reductions measures, alleviating the all other costs component, in Flanders make the electro-intensity range larger, offering a possibility for end-consumers to benefit from lower costs than in the other regions, and some of the neighbouring countries (mainly for industrial profiles E0, E1 and E2 where the competition on the ranges is tighter).

When comparing the scorecard on industrial electro intensive consumers from 2023 with the one from last year we notice that the competitive position of Belgium and its regions did slightly decrease.

Figure 94: Competitiveness scorecard for industrial electro-intensive consumers (profile E0 – E4)



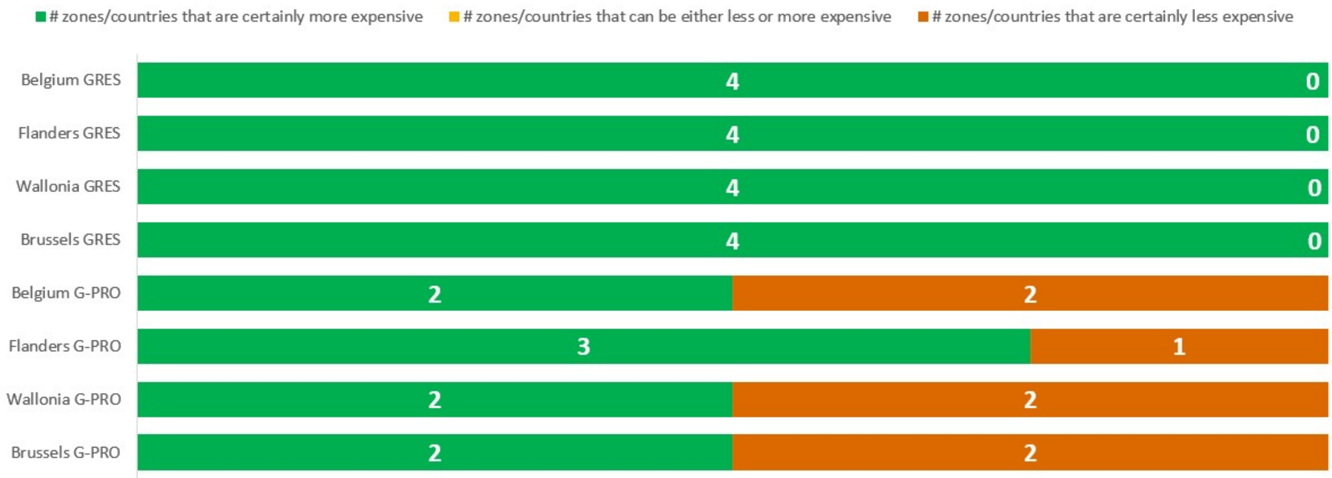
Natural Gas

Residential and small professional consumers

Figure 95 shows Belgium's competitiveness regarding natural gas. While for the G-RES profile, Belgium is the cheapest country, it is only the third cheapest country with regards to the G-PRO profile. Here Germany is the cheapest. On a regional level, for G-PRO, Flanders is more competitive than the other Belgian regions, but Germany is the most competitive in comparison with all countries considered. Wallonia is clearly the most expensive Belgian region and is less competitive than France and Germany for G-PRO.

With the help of this scorecard, we can conclude that the competitive position of Belgium for G-RES improved since 2022, but slightly decreased for G-PRO in 2023.

Figure 95: Competitiveness scorecard for residential and small professional natural gas consumers (profile G-RES and G-PRO)

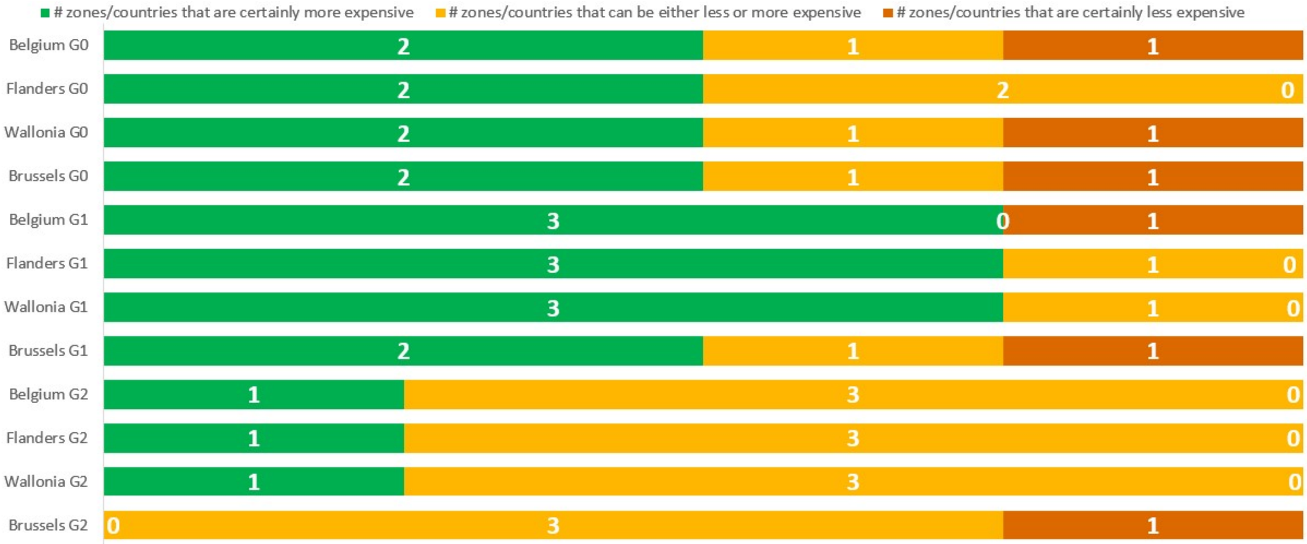


Large industrial consumers

For the G0 and G1 profiles, Belgium and its regions are competitive with the other countries under review. Belgium is rather competitive for G0 andG1 and in particular Flanders. Wallonia is cheaper than Brussels for G0, but for G0 the difference between the two regions is very small. For G1 and G2 we note that the difference between Flanders and Wallonia is very small with Flanders being a bit cheaper.

The countries and regions are very competitive for G1, as the results lie very close to each other. As in 2022 France is the cheapest country for G2 when the minimum range is considered. Belgium is not very competitive for G2. Compared to 2022 all countries and regions are closer to each other because of the higher commodity prices as well as the country specific measures in place.

Figure 96: Competitiveness scorecard for industrial natural gas consumers (profile G0 – G2)



The tax burden for electricity and natural gas consumers

When presenting the results, the importance of the third component (all other costs) was already set forward. It is thus interesting to compare the variations of this component across countries and for all consumers and particularly, its evolution because of reductions.

Electricity

Residential and small professional consumers

The all other costs component bears a significant importance on residential and small professional consumers' bills, and great variances can be observed across regions/countries. The general trend seems to indicate that the larger the consumer, the lower the tax rate. If reductions apply in certain countries (Belgium, France, Germany and the Netherlands), they are granted based on criteria directly related to consumers' annual offtakes or the nature of professional consumer's activity.

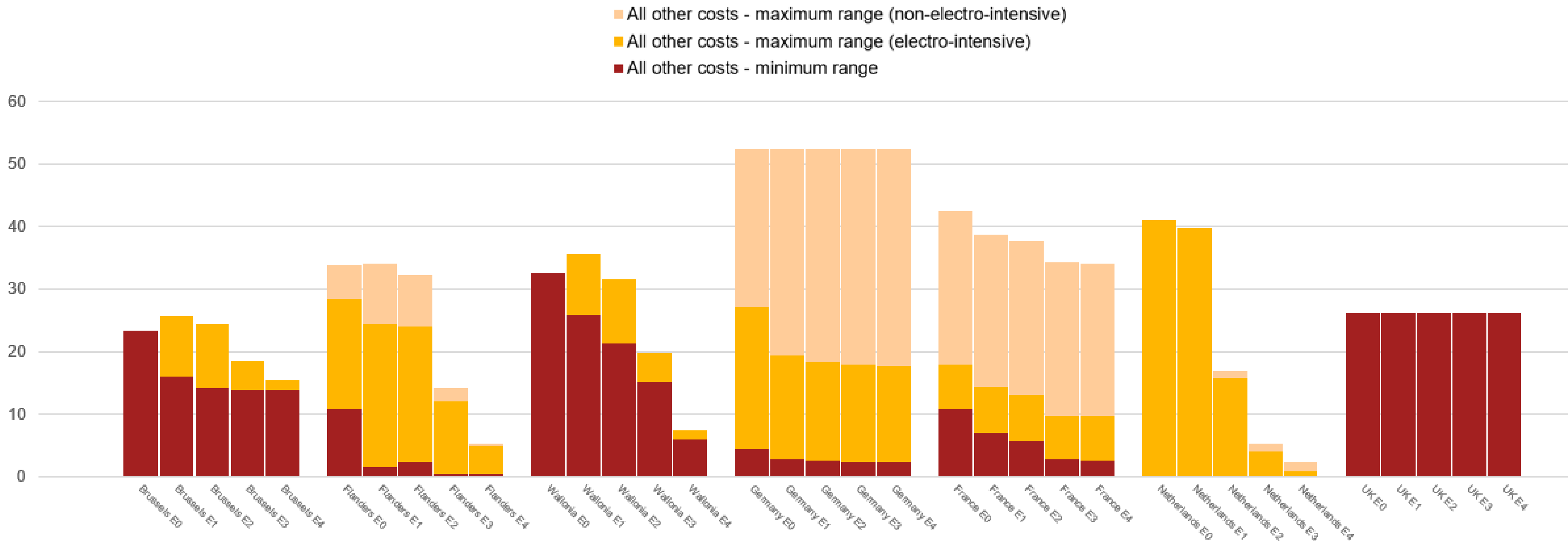
Large industrial consumers

It was observed that depending on the countries' tax regimes, electro-intensive and non-electro-intensive consumers could be charged differently. This differentiation entails competitive (dis)advantages across regions/countries when they introduced electro-intensity criteria to lower industrial consumers' tax burden. It is thus interesting to compare the variations of this component across regions/countries from our studied panel.

In the figure below, the full red bars represent the minimum amount of taxes that each consumer profile must pay in the specific country/region. The full yellow bar indicates the minimum-maximum cost range where different options are possible. Lastly, there is a transparent orange bar which represents the difference between the minimum and maximum cost for non-electro intensive consumers. This last bar is only applicable in Flanders, Germany, France and the Netherlands.

For this 2023 update, we also added a maximum range for Brussels and Wallonia for profiles E1 – E4, since an exemption is available for the federal excise duty. For the sake of readability of the figure below, we considered the minimum, red bar in the figure below, the amount of all other costs without the excise duty, for the three Belgian regions. We included the full amount of the excise in the electro intensive range so that it is also included in the minimum for non-electro intensive profiles.

Figure 97: Variance of the all other costs component in EUR/MWh (profile E0 - E4)



Firstly, we observe that the component is different in all Belgian regions and that only Flanders displays variable prices between non-electro- and electro-intensive consumers, while the three Belgian regions are all impacted by the exemption on the federal excise duty in the same way for E1 – E4 profiles. While the extent of the reductions differs, we see a decreasing trend across all countries/regions, namely that the larger the consumption, the lower the tax burden. One exception exists for all the profiles in the UK. The UK's all other costs component does not vary between profiles as no specific threshold depending on consumption level exists. This explains, among others, the less competitive position of the UK compared to all other regions/countries under review. We also observe a shift towards electro-intensity criteria regarding the allocation of the tax burden, namely in Belgium, Germany, France and the Netherlands. The higher competitiveness of Flanders compared to the other Belgian regions results from this shift made by the region when implementing the cap on the costs related to the green certificate quota. In the Netherlands, qualifying as an electro-intensive consumer significantly lowers the importance of the component in the total electricity cost. If France remains quite high for non-electro-intensive consumers, German's fares might indicate that non-electro-intensive consumers could finance the cost of reductions granted to electro-intensive consumers as the taxes soar to a maximum that is more than 4 times greater than for electro-intensive consumers.

Belgian federal and regional authorities mainly grant reductions and/or exemptions on taxes, levies and certificate schemes based on the level of electricity offtake, and not on the level of electro-intensity of an industrial consumer, except in Flanders with the cap on the financing of renewable energy and at the federal level with exemptions of the special excise duty. This could entail that Wallonia and Brussels' taxes, but also federal taxes, favour consumers that are not particularly affected by a lack of competitiveness of electricity prices given the lower prices they benefit from in comparison with other countries, while consumers that are more at risk suffer from significant disadvantage compared to their electro-intensive counterparts in neighbouring countries. For Brussels, this must be nuanced as it is a very urban region where the number of large industrial consumers is limited.

In Belgium, delving further into this component composition highlights that for Brussels and Wallonia, the cost of regional green certificates is the top-most tax component – apart from profile E4 in Brussels.[356] This also the case for Flanders if we consider the non-electro-intensive consumers. This tends to emphasise that regional strategies largely support the financing of renewable energies through taxes included in the electricity bill. In Brussels the "Levy for occupying road network" is one of the two most important components for profile E3 and E4.

Natural gas

Residential and small professional consumers

As it was the case for electricity, the all other costs component bears a significant importance on residential and small professional consumers' bills, and great variances can be observed across regions/countries. For natural gas too, the general trend seems to indicate that the larger the consumer, the lower the tax rate. If reductions apply in certain countries, they are granted based on criteria directly related to consumers' annual offtakes or the nature of professional consumer's activity. The reduced tax rates for G-RES profiles for countries that use this as an energy support mechanism really shows the difference in the average gas price. Noticeable too is that even though the Netherlands apply a price cap for G-RES, they still have the second highest bill of all countries/regions.

Large industrial consumers

Tax rates imposed on industrial consumption of natural gas are relatively low. If reductions and exemptions may be granted on taxes, one can observe that taxes are less numerous, and conditions of applications are less complex.

[356] See 5.1 Electricity: Detailed description of the prices, price components and assumptions Belgium Component 3 – all other costs (p.162)

Impact of reductions on network costs

Electricity

When presenting the results of the electricity and natural gas costs, it was observed that network costs are quite small, but might play a significant role when comparing the overall competitiveness of a country/region. As such, we detail below the importance reductions on network costs may have for countries.

Residential and small professional consumers

There is no reduction in force on network costs for electricity residential and small professional consumers.

Large industrial consumers

The figures below set out the reductions that can be granted in the regions/countries under the review and which might affect their global competitiveness. The dark orange bar represents the full transmission tariff while the yellow bar represents the transmission tariffs after reductions.

Belgium and the UK do not offer any reduction on the network cost component, but in the other countries under review, large baseload consumers such as E3 and E4 from this study can benefit from a transmission tariff reduction up to 80% (Germany). It should be clear from the figures below that these reductions have a significant impact on the network costs eventually paid by industrial consumers.

Figure 98: Network costs reduction in EUR/MWh (profile E3)[357]

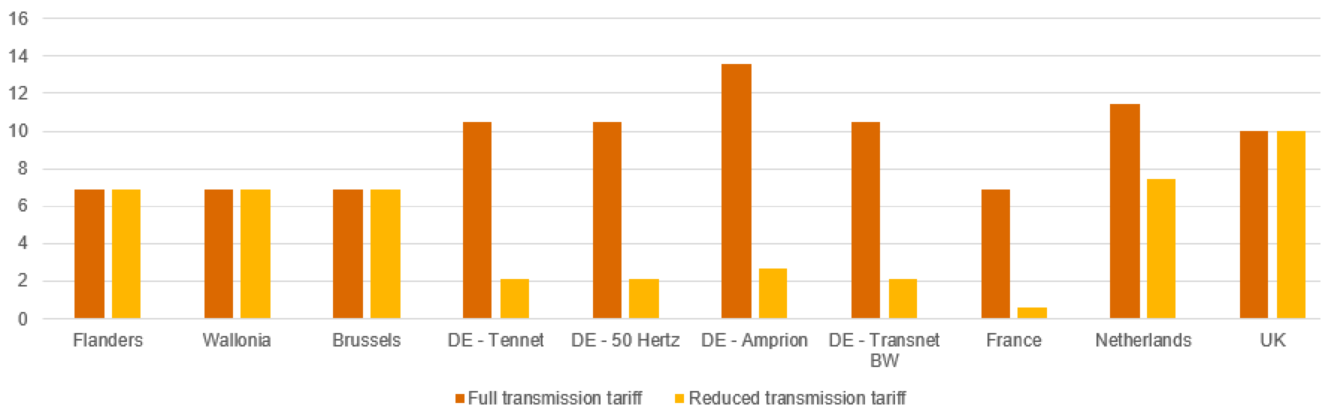
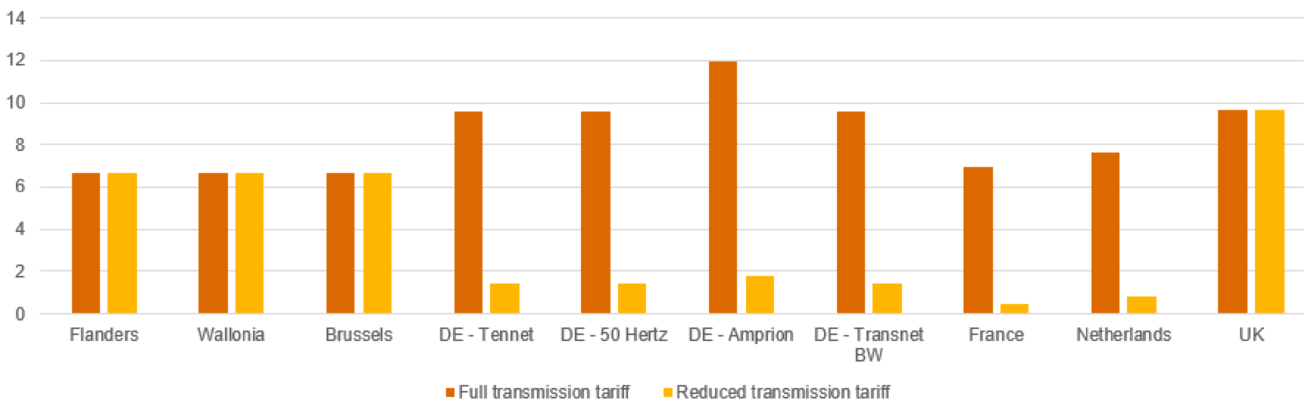


Figure 99: Network costs reduction in EUR/MWh (profile E4)[358]



[357] The hatched bar in France represents the range of prices for the network costs following reductions.

[358] The hatched bar in France represents the range of prices for the network costs following reductions.

The reductions in Germany, France and the Netherlands must be financed, and this is done differently in France and the Netherlands compared to Germany. While the Netherlands and France compensate these reductions with the transmission tariff itself (through regulatory accounts, for instance), Germany created a separate levy (the “StromNEV §19- Umlage”) to pay for the reduction. This levy is due by all consumers, but the large consumer profiles benefit from a large reduction. We can, therefore, state that high transmission tariffs in Germany are not the consequence of the reductions, but rather the cause. This reduction also explains the higher competitiveness of Germany when it comes to larger consumers. It is also interesting to note that the German Tennet region is significantly more expensive than the other regions.

Natural gas

There exists no reduction for natural gas’ network costs for residential, small professional consumers and industrial consumers as identified by this study.

8. Comparison of social measures for residential consumers

8. Comparison of social measures for residential consumers

Impact of social measures

For all countries under review, we provide an extensive analysis of social measures that were implemented to financially support households that are exposed to energy poverty, which develops "as a result of energy-inefficient buildings and appliances, high energy expenditures, low household incomes and specific household needs"[359]. Depending on the country, the concept varies but globally targets households with difficulties to afford their energy bills. As social measures are most frequently designed to tackle energy as a whole, we consider financial measures applying as such, and therefore including both electricity and natural gas. This chapter explores the impact of potential reductions on total energy bills for residential consumers (E-RES and G-RES) across countries and regions under review.

Methodology

As this exercise is based on the assessed energy bills from this study, it is important to mention that the objective of this task is not to reflect real consumer profiles. The residential profiles (3.500 kWh of electricity and 23.260 kWh of natural gas) from this study are usually considered as "standard" consumption profiles for a 2 parents-family with 2 children[360]. Figures reported with regards to the living income in this study therefore always refer to a four-members household including 2 adult parents and 2 children.

Please note that the approach followed this year slightly differs from the one used in previous iterations of this report to provide a more robust analysis. Results from this chapter cannot therefore be directly compared with figures displayed in previous versions of this study.

The cross-country comparison of social measures is based on a two-step approach:

(1) Extensive desk research is conducted to identify all the social measures that are offered to households by the countries in scope of this study to help coping with their energy bills. We also focus our analysis on the other social measures that can help a household composed of 2 adult parents and 2 children to increase its living wage. While measures are considered at national level in most countries, Belgium is a specific case were measures need to be assessed both at the federal and regional levels.

(2) The energy bills (including electricity and natural gas) are then weighted against the households' income to compare the households' energy effort rate across the different countries in scope of this study[361]. We make a distinction here between:

- Countries' effort rates compared to the average disposable income, housing costs excluded; and
- Countries' effort rates compared to a total living wage, by comparing the energy bill impact on average incomes and on low incomes households.

[359] (European Commission, 2020)

[360] (CREG, 2018)

[361] In France, the ONPE defines the energy effort rate as the "share of total energy expenditure in the household's disposable income". (ONPE, 2020)

Identification of social measures and living income within studied countries

Belgium

Social measures

Residential consumers may benefit from several measures to lower their energy bills. The present section covers all social measures existing in Belgium while distinguishing common federal measures from specific regional ones. In Belgium, the support granted to households mainly depends on the granting of a specific status: federal or regional protected consumer, which is broader. This status opens the possibility for households to meet eligibility criteria to benefit from social measures.

Federal level – Belgium

Social tariff

The social tariff for electricity and/or natural gas is a reduced tariff reserved for specific categories of households. It corresponds to the lowest commercial tariff on the market[362] and is the same for all energy suppliers and distribution system operators. The price increase of social tariff for electricity is capped to 10% per quarter and to 20% on an annual basis. The price increase of social tariff for natural gas is capped to 15% per quarter and to 25% on an annual basis. As it is set every three months, we consider the social tariff in force for January 2023.

At the federal level, residential households that meet one of the following two conditions canbe recognised as "**federal protected consumers**" and benefit from the social tariff:

- Be a residential end customer from category 1, 2A (Federal), 2B (Regional), 2C (Regional) or 3;
- Be the tenant of a social apartment (category 4).

Those categories are described below:

- **Category 1**: households benefiting from one of the below allocations from the Public Social Welfare Centre (PSWC)[363]:
  - Social integration income;
  - Financial social assistance equivalent to the social integration income;
  - Social assistance partially or fully covered by the State;
  - An advance on the income guarantee for the elderly or a disabled person's allowance.
- **Category 2A (federal level)** : households benefiting from one of the below allocations from the FPS Social Security:
  - Allowance for the disabled people due to permanent work incapacity of 65%;
  - Income replacement allowance;
  - Social integration allowance;
  - Allowance for third party assistance.
- **Category 2B (regional level)** : households benefiting from one of the below allocations:
  - Walloon Region: allowance for assistance to the elderly, via the Agency for Quality Life (AVIQ) ;
  - Brussels-Capital Region: allowance for assistance to the elderly,via Iriscare ;
  - German-speaking community: allowance for assistance to the elderly, via FPS SS DGPH
  - Flemish Region: care budget for elderly people in need of care (formerly: allowance for assistance to the elderly) via the "Zorgkas".

[362] Only active products offered by energy suppliers having a market share of minimum 1% of the Belgian residential customers are taken into account. Grouped purchases and products offered by energy cooperatives are excluded.

[363] Centre public d'action sociale (CPAS) / Openbaar Centrum voor Maatschappelijk Welzijn (OCMW)

- **Category 2C (regional level)**: households benefiting from one of the below allocations:
  - Walloon Region: an additional family allowance for children suffering from a physical or mental disability with a minimum score of 4 points in pillar 1 of the medico-social scale (recognition established by the FPS SS DGPH or AVIQ);
  - Brussels-Capital Region and German-speaking community: an additional family allowance for children with a physical or mental disability with a minimum score of 4 points in pillar 1 of the medico-social scale (recognition established by the FPS SS DGPH;
  - Flemish Region: via "Opgroeien, team Zorgtoeslagevaluatie", a care supplement for children with specific support needs with a minimum score of 4 points in pillar 1 of the medico-social scale a care supplement for children with specific support needs with a minimum score of 4 points in pillar 1 of the medico-social scale.
- **Category 3**: households benefiting from one of the below allocations from the Federal Pension Service:
  - Income guarantee for the elderly (GRAPA/IGO);
  - Allowance for assistance to the elderly;
  - Allowance for the disabled due to permanent work incapacity of 65%;
  - Allowance for assistance from a third party.
- **Category 4** (only for natural gas): households are tenants of a social apartment whose natural gas heating depends on a collective installation, in a building managed by:
  - A social housing corporation;
  - Regional housing corporations;
  - Social housing companies approved by the regional governments (Vlaamse Woningfonds, Fonds du Logement des Familles nombreuses de Wallonie, Fonds du Logement de la Région de Bruxelles-Capitale)
  - Public Social Welfare Centre.

Temporary measure:

Since February 1st 2021, consumers benefiting from the increased intervention of the social security on medical expenses ("intervention majorée"[364]) and having signed a contract for the electricity and/or natural gas for their own use (households) have been temporarily eligible to the social tariff. The temporary category of beneficiaries from the increased intervention of the social security has been extended until June 30th 2023 due to the rising trend of energy costs observed since the end of 2021[365].

In addition, the **federal protected consumer** categories listed above are also exempted from the federal excise duty on electricity and gas, according to art 429 § 2 of the law from 27th December 2004.[366] **Residential protected customers** will however be subject to the federal excise duty on electricity and natural gas as from July 1st 2023 (at a lower rate than non-protected customers), according to the Law of March 19th 2023 reforming taxes on the energy bill.[367]

VAT on electricity and natural gas bills lowered from 21% to 6%

In February 2022, the Belgian Federal government agreed on a reduction to the VAT from 21% to 6% for residential consumers on electricity for the months of March until September, and in mid-March it was decided to extend that measure to natural gas from April until September included. However, for technical and organisational reasons, those measures were only applied to monthly bills from April 2022 for both electricity and natural gas. The energy crisis continuing, those measures have been extended a first time until end of 2022 and then until 31 March 2023. [368] Since 1 April 2023, the VAT on electricity and natural gas is permanently fixed at 6%[369].

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364 The increased intervention on medical expenses is granted by the social security body ("mutuelle") to beneficiaries of social allocations or based on specific status (widow, invalid, retired person, handicapped person, unemployed or long-term incapacity, single-parent family, etc.). See more detailed explanations on https://www.inami.fgov.be/fr/themes/cout-remboursement/facilite-financiere/Pages/intervention-majoree-meilleur-remboursement-frais-medicaux.aspx

365 Source: https://economie.fgov.be/fr/themes/energie/prix-de-lenergie/tarif-social-pour-lelectricite

366 Source: https://www.ejustice.just.fgov.be/eli/loi/2004/12/27/2004021170/justel#LNK0154

367 Source: https://www.ejustice.just.fgov.be/eli/loi/2023/03/19/2023030776/justel

368 Source : https://www.energyprice.be/blog/6-vat-on-energy-extending-the-social-tariff-what-are-the-latest-measures-for-the-sector/#:~:text=The%20basic%20amounts%20of%20the,the%20energy%20bill%20of%20December

369 Source : https://www.ejustice.just.fgov.be/eli/loi/2023/03/19/2023030776/justel

Energy premiums

On 23rd December 2022, the Federal government adopted a law granting to households (residential clients) an overall amount of 183 EUR for electricity and 405 EUR for natural gas if they meet to 2 following criteria[370]:

(1) On 31th December 2022, a given household has either:
  a. a variable rate energy contract;
  b. a fixed price contract concluded or renewed after 30th September 2021
(2) The energy contract relates to the household's main residence.

This measure however does not apply to federal protected consumers that benefit from the social tariff described above on 1st January 2023. Regional protected customers are however still eligible to those energy premiums.[371]

Regional level - Brussels

Brussels may grant a "**regional protected consumer"** status to households in debt with their current energy supplier and which have received a formal notice, allowing them to claim the social tariff described above. In Brussels, households must apply to be granted this regional status. Depending on the institution by which the status is wished to be obtained, households also must be engaged in a debt mediation process, have revenues below a fixed threshold or be subject of a social inquiry by a PSWC.

If you receive the following regional allocations, you can also benefit from the federal social tariff (category 2B and 2C[372]):

- Allocation for the elderly (IRISCARE)
- Additional family allowance for children with a physical or mental disability with a minimum score of 4 points in pillar 1 of the medical-social scale.

Besides the reduced tariff, households do not pay any rental charges on electricity and/or natural gas meters.

The social tariff granted to additional regional categories – in comparison with federal categories – is financed by DSOs PSO's tariffs.

Regional level - Flanders

In Flanders, residential households can only be recognised under the **federal protected consumer** status as no additional regional categories of consumers exist to benefit from the social tariff.

However, if you receive the following regional allocations, you can also benefit from the federal social tariff (category 2B and 2C[373]):

- A care budget for older people in need of care (Zorgkas)
- Additional family allowance for children with a physical or mental disability with a minimum score of 4 points in pillar 1 of the medical-social scale.

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[370] Source : https://www.energieinfowallonie.be/fr/actualites/forfait-de-base-janvier-fevrier-et-mars-2023-0

[371] The legislation (Law of October 30th 2022 on temporary support measures resulting from the energy crisis for the 2022 vouchers [https://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=fr&la=F&cn=2022103001&table_name=loi], and Law of December 19th 2022 on the granting of a second federal electricity and gas premium [https://www.ejustice.just.fgov.be/mopdf/2022/12/23_1.pdf#Page36]) foresees that "The law does not apply […] to persons in a family or household of which one member has been qualified as a protected residential customer within the meaning of Article 20, § 2/1, of the Electricity Act by 30 September 2022 (example for electricity), excluding thus only federal protected customers.

[372] Categories considered for social tariffs, https://www.creg.be/fr/consommateur/tarifs-et-prix/tarif-social#h2_2

[373] ibid

Besides that, households facing financial difficulties may be granted the below-listed measures:

Table 128: Flanders social measures

Flanders Social Measures		
Measures	**Explanation**	**Eligibility criteria/Conditions of application**
Pre-paid meters[374]	Meter that works as a conventional meter but with a prepayment function. The consumer is either subject to the maximum social tariff or a fixed price (average price of commercial suppliers).	Such meter is placed when: • DSO is the energy supplier, and consumer is in payment default.[375] • Emergency credit: every consumer is awarded an emergency credit of €110 for both electricity and natural gas. In case the consumer does not load his digital meter, he can still use this emergency credit. The consumer has to reimburse his consumption of emergency credit. Normally the emergency credit amounts €75. This was increased up to €110 from 1st November 2022 until 30 June 2023. • DSO becomes an energy supplier as a commercial supplier terminates the contract due to payment default, and consumer does not have a new supplier after 2 months. As of 1st July 2022, this delay is reduced from 2 months to 45 days. Minimum energy supply for pre-paid meters: • Electricity: pre-paid meters for electricity are equipped with a 10 Ampere function that switches on when all credit (including emergency credit) has been used. This function can, however, be switched off when a household fails to charge his meter for a certain amount of time. • Natural gas: during the winter months (1/11 – 31/03), PSWCs can be asked for financial help to have a minimum natural gas supply. The decision to grant financial help is discretionary to each PSWC and based on a review of each applicant's profile. If granted, financial help is provided every two weeks, and the extent of the help depends on the consumer status (protected customer or not) and house.
Payment plan	A payment plan can be planned when a household faces financial issues to pay for its electricity and/or natural gas bills.	Such a mechanism can be activated either: • Upon household's demand; • Upon the supplier's initiative in the event of formal notice following the non-payment of an invoice. As the payment plan depends on each household's situation, this social measure is presented in this study in a qualitative manner.
Payment exemptions	Consumers recognised as federal protected consumers are exempted from paying the: • Bijdrage energiefonds (or Energieheffing)[376]; • Costs related to reminders or notices of default.	Meeting federal protected consumers conditions.

When a consumer is in payment default, is supplied by the DSO and does not have a federal protected consumer status, then they would also pay a different price based on a market average.

[374] (Vlaamse overheid, 2020)

[375] This changed from the 1st July 2022. From then on, the prepayment function will be activated in the distribution for electricity for everyone who contacts the DSO directly.

[376] (Vlaamse Overheid, 2020)

Regional level - Wallonia

Wallonia may grant a "**regional protected consumer**" status to households which are in:

- Educational guidance of a financial nature from the PSWC;
- Debt mediation with a PSWC or an approved debt mediation centre;
- Collective debt settlement.

Furthermore, if you receive the following regional allocations, you can also benefit from the federal social tariff (category 2B and 2C[377]):

- A care budget for older people in need of care (AVIQ)
- Additional family allowance for children with a physical or mental disability with a minimum score of 4 points in pillar 1 of the medical-social scale.

Table 129: Wallonia social measures

Walloon Social Measures		
Measures	**Explanation**	**Eligibility criteria/Conditions of application**
Social tariff	The social tariff for electricity and/or natural gas is a reduced tariff reserved for specific categories of households. It has the lowest commercial tariff on the market and is the same for all energy suppliers and distribution system operators. The price increase of social tariff for electricity is capped to 10% per quarter and to 20% on an annual basis. The price increase of social tariff for natural gas is capped to 15% per quarter and to 25% on an annual basis. As it is set every three months, we consider the social tariff in force for January 2023. In addition to the reduced tariff, households do not pay any rental charges on electricity and/or natural gas meters. The social tariff granted to additional regional categories – in comparison with federal categories – is financed by DSOs PSO's tariffs.	Federal and regional protected consumers can benefit from the social tariff. For regional protected consumers, social tariff can only be granted if they are supplied by the DSO. In 2022 and 2023 a temporary protection measure was taken by the Walloon government, extending social tariff (cyclical regional protection)
Pre-paid meters	Meter that works as a conventional meter with a prepayment function. The prepayment meter is free of charge if requested by the PSWC or in case of a move if the consumer had a prepayment meter in his former place. Pre-paid meters placement costs are free for: • Unprotected consumers with payment default from 100 euros (electricity or natural gas) or 200 euros (electricity and natural gas). • Federal or regional protected consumers.	Such meter is placed: • Upon any consumer's demand; • Upon PSWC's demand; • Upon supplier's demand in case of payment default from 100 euros (electricity or natural gas) or 200 euros (electricity and natural gas). Federal or regional protected consumers who have pre-paid meters: • Are directly provided in electricity and natural gas by their DSO; • Are provided with meters equipped with a power limiter (only for electricity) to ensure a minimum supply. The guaranteed minimum supply is only activated at the request of the PSWC; • Can receive financial assistance to recharge their natural gas budget meter during the winter period if they encounter payment difficulties. The decision to grant winter assistance is overseen by the local energy commission.

[377] Categories considered for social tariffs, https://www.creg.be/fr/consommateur/tarifs-et-prix/tarif-social#h2_2

Payment plan	A payment plan can be planned when a household faces financial issues to pay for its electricity and/or natural gas bills.	Such a mechanism can be activated either: • Upon household's demand; • Upon the supplier's initiative in the event of formal notice following the non-payment of an invoice. The supplier must propose a reasonable payment plan to his customer and inform him that he can benefit from the assistance of the PSWC in his negotiation. The collection procedure is suspended if a reasonable payment plan is concluded or until the PSWC can make a socio-budgetary analysis of the customer and intervene, if necessary, in the payment of the customer's debt. No fee can be claimed for a reasonable payment plan. Furthermore, a limit is set on the collection costs that can be claimed by suppliers from customers under the non-payment procedure[378]. As the payment plan depends on each household's situation, this social measure is presented in this study in a qualitative manner.

Disposable income and living wage

According to Eurostat, Belgium's ***gross adjusted disposable income corrected for PPP*** for 2021 reached 27.726,00 EUR[379]. This value is used to weigh energy's relative share in a residential consumer's income. From the latter, 17,60% are dedicated to housing[380] that is deducted, resulting in a corrected gross disposable income of 22.846,22 EUR for all three Belgian regions.

In Belgium, the living wage ("revenu d'intégration") is under the responsibility of PCSWs. They may grant such revenues to low-income people that meet all the following conditions:

(1) The person must be of Belgian nationality or:
  a. a European citizen (or a family member with European nationality), and have the right of residence for more than three months;
  b. a foreigner registered in the population register;
  c. a recognized refugee;
  d. a stateless person;

(2) The person must live in Belgium and be legally resident;

(3) The person must be of legal age (18) or:
  a. a minor emancipated by marriage;
  b. an unmarried minor who is responsible for one or more children;
  c. a minor who is pregnant;

(4) The person must not have enough financial resources and not able to obtain them on his own;

(5) The person must be willing to work unless health reasons or special reasons related to one's situation prevent from doing so;

(6) The person must have asserted all his entitlement to other social benefits, such as unemployment.

[378] According to the March 30th, 2006 Walloon Government decrees on public service obligations in the electricity and natural gas markets (respectively Art. 30 ter and Art. 33 ter), the collection costs cannot exceed the sum of: the outstanding balance due on overdue invoices, any contractual interest, capped at the legal rate and any collection costs for unpaid invoices, capped at 7.5 euros for a reminder letter and 15 euros for a letter of formal notice. The total costs claimed for sending reminders and letters of formal notice or for non-payment may not exceed 55 euros per year and per energy.

[379] https://ec.europa.eu/eurostat/databrowser/view/TEC00113/default/table?lang=en

[380] https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-2b.html

The amount of this living wage varies depending on one's conditions as presented below:

- **Category 1**: a person living with one or more other people with whom they constitute a common household;
- **Category 2**: a person living alone;
- **Category 3**: a person responsible for a family with at least one unmarried minor child.

The minimum amount that can be claimed by a household of four people (2 adults and 2 children) with social revenues in Belgium is 1.640,83 EUR (category 3)[381].

In addition, child allowances are granted in Belgium to any household with children. These extra allowances increase the maximum potential living income perceived by Belgian low-income households (including the possibility of a financial aid for disabled children). Depending on the region, these allowances might change as follows[382]:

- **Brussels**: for a two-children household, allowances for small children under 5 years old would reach a minimum of 484,32 EUR/month[383] to reach a maximum of 542,89 EUR/month[384] for children following higher education.
- **Flanders**: for a two-children household, allowances for small children under 4 years old would reach a minimum of 511,24 EUR/month[385] to a maximum of 525,14 EUR/month[386] for children above 18 years old following higher education.
- **Wallonia:** for a two-children household, allowances for small children under 4 years old would reach a minimum of 456,10 EUR/month[387] to a maximum of 541,88 EUR/month[388] for children above 17 years old following higher education.

The minimum amount that can be claimed by a household of four people (2 adults and 2 children) with social revenues in Belgium is therefore ranging from a monthly minimum of 2.125,15 EUR to a monthly maximum of 2.183,72 EUR for Brussels, from a monthly minimum of 2.129,01 EUR to a monthly maximum of 2.165,97 EUR for Flanders, and from a monthly minimum of 2.096,93 EUR to a monthly maximum of 2.182,71 EUR for Wallonia.

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[381] Allocation for a couple in charge of minimum one minor child in 2023.

[382] (KidsLife, 2023)

[383] Considering the 2023 system, this situation is a minimum situation when the children are between 0-11 years old (175,76 EUR/month per child). Plus, if parents have gross yearly revenues <37,1 kEUR, extra allowances are granted (46,87 EUR/month for a first child between 0 and 11; 82,02 EUR/month for the second). Finally, an additional age allowance is granted yearly and reaches 23,43 EUR/year per child between 0 and 5. Allowances for large households are not considered as this starts from 3 children.

[384] Considering the 2023 system, this situation is a maximum situation when the children are between 18-24 years old following higher education (+187,147 EUR/month per child). Plus, if parents have gross yearly revenues <37,1 kEUR, extra allowances are granted (58,59 EUR/month for the first child; 93,74 EUR/month for the second child). Finally, an additional age allowance is granted yearly and reaches 93,74 EUR/year per child between 12 to 24 years old registered in high school. Allowances for large households are not considered as this starts from 3 children.

[385] Considering the 2023 system, this situation is a minimum situation when the children are below 18 (173,20 per child). Plus, if parents have gross yearly revenues <34,5 kEUR, extra allowances are granted (69,12 EUR/month per child). An additional 21,23 EUR/year per child (schoolbonus) is also granted for children under 4 years old.

[386] Considering the 2023 system, this situation is a maximum situation when the children are born before 2019 and above 18 (99,70 + 28,72 EUR/month for the youngest child ; 184,47 + 28,72 EUR/month for the second child). Plus, if parents have gross yearly revenues <34,5 kEUR, extra allowances are granted (69,12 EUR/month per child). An additional 63,67 EUR/year per child is granted if child goes to school.

[387] Considering the 2023 system, this situation is a minimum situation when the children are between 0-17 years old and born after 2020 (181,61 EUR/month per child). Plus, if parents have gross yearly revenues <31,6 kEUR, extra allowances are granted as social supplement (+54,92 EUR/month for the first child ; + 34,50 EUR for the second one). An additional 23,43 EUR/year per child is granted if children go to school who are between 0-5. Allowances for large households are not considered as this starts from 3 children.

[388] Considering the 2023 system, this situation is a maximum situation when the children are between 18-24 years old and born before 2020 (+112,25 EUR/month for the first child, + 207,70 EUR/month for the second child). Plus, if parents have gross yearly revenues <31,6 kEUR, extra allowances are granted as social supplement (+54,92 EUR/month per child). An additional 137,29 EUR/year per child is granted if children go to school and are at least 18 years old and household benefits from the social tariff. Allowances for large households are not considered as this starts from 3 children.

Germany

Social measures

Germany didn't provide any specific subsidies for electricity or natural gas in 2022, but that is changing for 2023 as a "defence shield" package amounting 200 billion euros has been approved by the country in December 2022 to support consumers in the context of the energy crisis. Those measures will be in force as of 1st March 2023 and will have a retroactive action for January and February 2023[389] [390].

The main measures for households (also applicable for small companies) consist of a price cap for both electricity and natural gas, protecting citizens against new sharp energy price increases.

The electricity cap for households is fixed for 2023 at 0,40 EUR/kWh for households up to 80% of their typical consumption level from previous year. The natural gas cap for households is fixed for 2023 at 0,12 EUR/kWh for households up to 80% of their typical consumption level from previous year. (All the above amounts are tax included).

On top of that, extraordinary electricity costs or debts can also be covered by the social welfare office/jobcentre in the following exceptional cases[391]:

- The threat of the electricity supplier to cut off the electricity.
- Electric heating systems, decentralised hot water production.
- If a subsequent payment from the annual electricity settlement cannot be made.

Cash payments for back payments or accrued electricity debts are generally made in the form of loans, in rare cases aid is granted, and partial loans and partial aid are also possible. A loan can only be refused if it can be proven that the high electricity costs are due to their own fault.

If the water heating is operated with electricity, there is a claim for additional demand. In the case of a flat with electrically operated heating systems, only the actual, reasonable heating costs are covered.

These measures are difficult to quantify in this study because they are discretionary and applicable on a case-by-case basis. Consequently, no social measures with regards to the reduction of electricity and natural gas bills can be used in this exercise. However, we do depict the difference in effort rates for low-income consumers compared with other consumers in more prosperous conditions.

Disposable income and living wage

Germany's ***gross adjusted disposable income corrected for PPP*** amounted to 30.462,00 EUR in 2021[392]. As housing costs are estimated to be 23,40% of Germany's disposable income[393], we obtain a corrected gross disposable income of 23.338,49 EUR.

Regarding low-income consumers, Germany offers '*Arbeitslosengeld II*' – ALG II in short – (or Unemployment Benefit II) and '*Sozialgeld*' (or Social Security Benefit) as part of the benefits for securing living and thus part of the benefits for securing a decent minimum subsistence level[394]. ALG II and SGB II have been merged under the Hartz IV law, have been replaced since 1 January 2023 by a new "citizen income" (*Bürgergeld-Gesetz*)[395]. This led to a significant increase of the standard rate received people in need in Germany[396].

The basic standard monthly rate in force in 2023 is 502,00 EUR and applies if you are single and/or a single parent and run your own household. A monthly amount of 451,00 EUR per person is granted for partners with no other revenues who are living together (90% of the standard benefit).

[389] https://www.aa.com.tr/en/europe/germany-s-bundestag-approves-price-cap-for-gas-electricity/2764863

[390] https://www.cleanenergywire.org/news/germany-approves-gas-and-power-subsidies-industry-worried-about-implementation

[391] (Betanet.de, 2019)

[392] https://ec.europa.eu/eurostat/databrowser/view/TEC00113/default/table?lang=en

[393] https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-2b.html

[394] Bundesministerium für Arbeit und Soziales, 2021

[395] https://www.bundesregierung.de/breg-de/themen/entlastung-fuer-deutschland/buergergeld-2125010

[396] ibid

The standard rate for children old living in a household under that scheme is now 420,00 EUR/month for between 14 and 17 years, reaches 348,00 EUR for children between 6 and 13 years old, and 318,00 for children up to 5 years. (Rates applicable as of 1st January 2023) Besides that, new "citizen income", additional financial supports can be granted under certain circumstances.[397]

On a monthly basis, these are still specific cases where additional allowances per person are justified:

- Payment of health and long-term care insurance contributions for persons entitled to benefits which are obliged to pay insurance pursuant to § 5.1 no. 2a SGB V or § 20.1 no. 2a SGB XI (§ 251.4 SGB V, § 59.1 SGB XI) – max: 165,22 EUR[398];
- Decentralised hot water supply: If the energy required to produce hot water is not already included in the heating costs because the hot water is produced separately from the heating by devices installed in the accommodation (e.g. instantaneous water heaters), an additional requirement is initially recognised in accordance with § 21 Para. 7 SGB II, the amount of which is between 0,8 and 2,3% of the standard requirement, unless there is a different requirement in the individual case or part of the reasonable hot water requirement is recognised in accordance with § 22 Para. 1 SGB II : 10,37 € for adult members of a benefit community – max: 5,88 EUR for children under 18 years old [399];
- Individual cases: In the case of persons entitled to benefits, additional needs are recognised if in the individual case there is an irrefutable, ongoing, not just one-off special need (§ 21 para. 6 SGB II). The additional need is irrefutable if it is not covered by the contributions of third parties and considering the potential savings of the beneficiaries and its amount deviates considerably from an average need. E.g. Care products for neurodermatitis, hygiene products for HIV infection; cleaning and household help for wheelchair users, costs of exercising rights of access, etc. In such a case, the amounts granted to adult members of a benefit community corresponds to 10% of their standard benefit, i.e. 45,10 EUR [400].

A grant towards insurance contributions for private health and long-term care insurance can also be provided under certain circumstances but is not included here as depending on a case-by-case basis.

The minimum amount that can be claimed by a household of four people (2 adults and 2 children) with social revenues in Germany is therefore estimated at 1.538,00 EUR with two small kids whereas the maximum amount reaches 2.195,14 EUR with 2 older children. For the minimum amount, the new "citizen income" allocation and the child allowance (for children below 5 years old, as it represents the minimum possible amount) have been solely considered, where the three additional allowances mentioned above have been added on top of the child allowance for kids between 14 and 17 years old for the maximum amount that can be claimed.

[397] Further financial support mechanisms exist but cannot be precisely quantified in the scope of this study.

[398] https://www.lohn-info.de/krankenversicherung_freiwillig.html

[399] https://www.hartziv.org/mehrbedarf/warmwasser.html

[400] https://www.hartziv.org/mehrbedarf/haertefaelle.html

France

Social measures

France implemented social measures to help households considered in “energy poverty” (“précarité énergétique”). To be considered as vulnerable, a household or person must face “difficulties in obtaining the supply of energy necessary to meet his or her basic needs in his or her home because of inadequate resources or housing conditions”[401]. Objectively speaking, three criteria are defined to measure energy poverty:

(1) Energy effort rate (“Taux d’effort énergétique (TEE)”):
  a. More than 10% of income is spent on energy;
  b. Households are part of the poorest 30% of the French population (first 3 income deciles).

(2) Low income, high expenses indicator (“Indicateur bas revenus, dépenses élevées”): the household is considered in the situation of “energy poverty” if they have:
  a. An income below the poverty line or 60% of national median income;
  b. Energy expenditures, compared to their housing size (m²) or family composition, are higher than national median energy expenditures.

(3) Feeling of discomfort: a subjective indicator that assesses people’s feelings towards thermal (dis)comfort and economic vulnerability.

To counter energy poverty, France replaced social tariffs with an energy voucher (“chèque énergie”) in 2018. This energy voucher is a direct financial help that households are to use to pay for their energy bills, regardless of their heating means (electricity, natural gas, fuel, wood, etc.). The amount perceived depends on the level of income and the composition of the household. For 2023, any household whose Reference Tax Income (RTI) is below 11.000,00 EUR per consumption unit (CU) will be eligible to this energy voucher. The table below depicts the amount that can be perceived by households in 2023[402].

Table 130: France energy vouchers amounts

Energy Voucher 2023				
Consumption Unit (CU)	**RTI < 5.700 EUR/CU**	**RTI between 5.700 and 6.800 EUR/CU**	**RTI between 6.800 and 7.850 EUR/CU**	**RTI between 7.850 and 11.000 EUR/CU**
1 person (1 CU)	194 EUR	146 EUR	98 EUR	48 EUR
2 people (1 CU + 0,5 CU)	240 EUR	176 EUR	113 EUR	63 EUR
≥ 3 people (1 CU + 0,5 CU + 0,3 CU for each additional person)	277 EUR	202 EUR	126 EUR	76 EUR

Given the variable potential value of this measure and the limited economic and private information about our residential profile, we use in this study a range from 126 EUR (minimum value) to 277 EUR (maximum value) for our typical household[403].

Note: France granted last year an exceptional one-off energy voucher ranging from 100 EUR to 200 EUR that could be used until 31st March 2023. This measure, taken by the government to limit the increase in cost of the energy bill for French households given the current volatility on the energy market, has not been renewed and is therefore not included in our computations this year.

In France there is also a fund that helps people regarding different housing costs aspects. This aid can take many forms, e.g. payment of first rent, payment of the costs regarding the opening of meters (gas, electricity, water), etcetera. This additional support is however n quantifiable as established on a case-by-case basis, and is thus not considered for the computation of social measures.

[401] (Ministère de la Transition écologique et solidaire, 2020)
[402] https://www.service-public.fr/particuliers/actualites/A15572
[403] Where we assume a family composed of 2 adults and 2 children (CU= 1+0,5+0,3+0,3=2,1)

Disposable income and living wage

The ***gross adjusted disposable income corrected for PPP*** for France was 27.247,00 EUR in 2021[404]. Furthermore, we deduct housing costs that are deemed to be 17,40%[405] of France's disposable income (2020 value, latest data available). Therefore, we estimate a corrected gross disposable income of 22.506,02 EUR.

France implemented a living income, called "Revenu de Solidarité Active" (RSA) since 2009, which targets low-income people. To benefit from this allowance, one must respect several conditions that are listed hereafter:

- Be over 25 years old or of 18 if the applicant has a dependent or unborn child or if he can prove 2 years of full-time equivalent professional activity in the last 3 years;
- No age requirement exists for people who are responsible for the care of one or more children (or unborn children);
- Permanent residence in France. Stays outside France must not exceed 3 months;
- For European Union nationals: a valid residence permit is required;
- For people of foreign nationality, the applicant must have been legally resident in France for at least 5 years;
- The average monthly income for the 3 months preceding the application of the entire household must be less than the amount of the RSA corresponding to the composition of the family;
- Entitlement to other aid (e.g. specific solidarity allowance) must have been claimed as a matter of priority.

Similarly to Belgium and Germany, the amount granted by France to low-income citizens varies according to the person's conditions (e.g. isolated or not). In France this revenue is called "Revenu de solidarité active" (RSA - *active solidarity income*). This amount increases with the number of children that we assumed to be limited to two here, leading to a RSA amount of 1.256,94 EUR/month for 2023. In addition, France also grants family allowances to all households with a minimum of two children[406]:

- Family allowances: paid without conditions as from the second dependent child residing in France. Their amount is modulated according to the resources of the household or the person in charge of the children, and the number of children (140,54 EUR for 2 children in 2023). They can be completed by an additional amount of 70,26 EUR for each child above 14 years old.
- Back-to-school allowance: provided on an income-basis for any child attending school and aged from 6 to 18 years old. The amount of the allowance for school year 2022 ranged from 392,05 EUR/year (for a child from 6 to 10 years old) to 428,02 EUR/year (for a child from 15 to 18 years old).

The minimum monthly amount that can be claimed by a household of four people (2 adults and 2 children) with social revenues in France is therefore estimated at 1.397,48 EUR with two small kids whereas the maximum amount reaches 1.821,19 EUR with 2 older children studying. For the minimum amount, the "Revenu de solidarité active" allocation and the standard child allowance (for children below 14 years old, as it represents the minimum possible amount) have been solely considered, where the additional amount for children above 14 years old and the 'back-to-school' allowance for children above 15 years old have been added on top for the maximum amount that can be claimed.

[404] https://ec.europa.eu/eurostat/databrowser/view/TEC00113/default/table?lang=en
[405] https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-2b.html
[406] https://www.cleiss.fr/docs/regimes/regime_france6_prestations-familiales.html

The Netherlands

Social measures

Price cap for electricity and natural gas

A price cap for electricity and natural gas has been enforced as of 1st January 2023 in the Netherlands to help household face the energy price increase that started end of 2021. Dutch citizens will now pay a maximum tariff up to certain ceilings:[407]

- 0,40 EUR/kWh for 2.900kWh of electricity used
- 1,45 EUR/m3 for 1.200m3 of natural gas used

(All those amounts are including taxes)

When those ceilings are exceeded, household will have to pay the tariff mentioned in their energy contract. If the tariff in one's energy contract is lower than the price cap mentioned above, the lower tariff out of the two will be used.

VAT reduction measure

A temporary reduction on the VAT rate for electricity and natural gas has been agreed for six months during the second part of 2022 (with a reduced rate of 9% from July to December 2022). This reduction was valid to all households, thus applying also to low-income ones. This measure is however not applicable anymore in 2023 and the VAT rate is back to its previous level since 1st January 2023[408].

One-off allowance for low-income households

For 2023, as it was the case last year, a one-off allowance of 1.300 EUR on the energy bill will be entitled to low-income households[409].

Discount on the energy tax

A reduction of the energy tax for each residential electricity connection was put in place in 2022 and averaged 784,00 EUR last year. This tax reduction amount will be decreased for 2023, with an amount reduced to 596,85 EUR. Combined with an energy tax for electricity that will double in 2023, and an expected additional tax of 10 cEUR/m^3 for natural gas, consumers are expected to pay higher energy bills this year[410].

Disposable income and living wage

According to Eurostat, the Netherlands' ***gross adjusted disposable income corrected for PPP*** reached 28.277,00 EUR for 2021[411]. With a 22,90% share of disposable income for housing costs[412], the Netherlands has a corrected gross disposable income of 21.840,70 EUR.

The Dutch government introduced a social minimum ("*sociaal minimum*")[413] that represents the minimum amount a person needs to make a living. In case a person who is entitled to the above-mentioned allowances does not reach the social minimum, a supplement can be granted[414] for low-income people to make up for the social minimum. For the year 2023 the social minimum is 1.934,45 EUR/month for married people.[415] We will therefore use this amount as the basis for our computations.

Additionally, several financial support incomes exist for low-income people designed to address different basic needs:

[407] https://www.government.nl/topics/energy-crisis/cabinet-plans-price-cap-for-gas-and-electricity

[408] https://www.expat-check.com/news/the-energy-bill-in-2023-will-look-completely-different/#:~:text=The%20energy%20tax%20reduction%20will,than%2015%20euros%20per%20month.

[409] https://www.rijksoverheid.nl/actueel/nieuws/2022/12/21/wat-verandert-er-in-2023-op-het-terrein-van-het-ministerie-van-sociale-zaken-en-werkgelegenheid#:~:text=Het%20kindgebonden%20budget%20gaat%20in,met%20%E2%82%AC%20468%20per%20jaar.

[410] ibid

[411] https://ec.europa.eu/eurostat/databrowser/view/TEC00113/default/table?lang=en

[412] https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-2b.html

[413] (Rijksoverheid, 2020)

[414] Toeslagenwet.

[415] https://www.uwv.nl/particulieren/bedragen/detail/sociaal-minimum

- An **housing allowance ("*huurtoeslag*")**[416]: allowance granted to low-income people to help them pay for their rent. To be granted this allowance, the following criteria must be met:
    a. Rent is below 808,06 EUR (for people >23 years old or with a child) or 452,20 EUR (for people between 18 and 23 years old);
    b. The rent is a self-contained living space;
    c. The income of the person and his partner/co-inhabitants is not too high. This limit depends on the person's rent, age and composition of the household;
    d. Assets are below 33.748,00 EUR/person or 67.496,00 EUR for partners together;
    e. The person must live in the Netherlands, be registered at the municipality and have (or the partner/co-residents) the Dutch nationality or a valid residence permit;
    f. The person must be ≥ 18 years old;
    g. The person must have a signed tenancy agreement, pays the rent and can prove it with bank statements;
    h. Other specific situations may slightly change applying rules if the person is under 18 years old, is cared for at home, has a large household, is disabled, etc.

  This allowance differs from one to another (depending in particular from incomes of the household and the number of children), with an estimated averages of 172,00 EUR/month in 2023.[417]

- A **Care allowance *("Zorgtoeslag")***[418]: this allowance is a contribution to help support the costs of people's Dutch health insurance. To be granted this allowance, people must meet the following criteria in 2023[419]:
    a. Be ≥ 18 years old;
    b. Have Dutch health insurance;
    c. Have an income < 38.520,00 EUR (lone person) or < 48.224,00 EUR (partners);
    d. Have the Dutch nationality or a valid residence permit;
    e. Have a maximum (combined) assets of 127.582,00 EUR (161.329,00 EUR for partners).
    f. Other specific situations may slightly change applying rules be a military, detained, foreign student, not having a fixed address, etc.

  For 2023, partners with a net income of less than 25.000 EUR/year would be granted a total monthly amount of 265,00 EUR.[420] This amount is degressive and depends on the income of the household. As this amount is conditional on the subscription of a health insurance, we do not consider it here in the calculation of the minimum disposable income.

There are two allowances for children that can be added on top of those measures:

- **Regular child allowances**[421] ("*kinderbijslag*"): allowance that can range in 2023 from 269,76 EUR/quarter (children between 0 to 5 years) to a maximum of 385,37 EUR/quarter (children aged between 12 to 17 years old) per child and per quarter.
- **Child budget allowance**[422] *("kindgebonden budget")*: people having children benefit from this allowance under the same conditions applying for the care allowance and have 1 or more children under the age of 18. For a two-parents and two-children household, an amount of 3.185,00 EUR/year can be reached if regular child allowances ("*kinderbijslag*") are granted.

The minimum monthly amount that can be claimed by a household of four people (2 adults and 2 children) with social revenues in the Netherlands is therefore estimated at 3.082,12 EUR with two small kids (below 5 years old) whereas the maximum amount reaches 3.159,20 EUR with 2 older children (12-17 years old). For the minimum amount, the "Sociaal minimum" is combined with a "huurtoeslag" of 172,00 EUR/month, the regular child allowances for two children under 5 years old and the child budget allowance available monthly. For the maximum monthly amount, we take into consideration the higher regular child allowance for children from 12 to 17 years old.

416 (Belastingdienst, 2023)
417 https://www.rijksoverheid.nl/actueel/nieuws/2023/02/17/recht-op-huurtoeslag-voor-meer-huurders-met-lage-inkomens
418 (Belastingdienst, 2023)
419 https://www.zorgwijzer.nl/faq/zorgtoeslag
420 ibid
421 https://www.svb.nl/nl/kinderbijslag/nieuws/kinderbijslag-1-januari-2023-gaat-omhoog
422 https://www.rijksoverheid.nl/actueel/nieuws/2022/12/21/wat-verandert-er-in-2023-op-het-terrein-van-het-ministerie-van-sociale-zaken-en-werkgelegenheid#:~:text=Het%20kindgebonden%20budget%20gaat%20in,met%20%E2%82%AC%20468%20per%20jaar.

The UK

Social measures

In the UK, in 2018, 2,40 million households (or 10,93% of the total population)[423] are considered to be energy poor, which happens when[424]:

- Energy costs are above average (> national median level)[425];
- If that amount was to be spent, households would be left with a residual income[426] below the official poverty line, which is of 60% of national median income.

To further delimit energy poverty, the UK also considers the average energy poverty gap, defined as the reduction in the energy bill that the average energy-poor household needs to not be classified as energy poor[427]. This amounted to 334 GBP in 2018.

Several measures exist in the UK to support households in a situation of energy poverty. The table below lists the existing measures.

Table 131: The UK social measures

The UK Social Measures		
Measures	**Explanation**	**Eligibility criteria/Conditions of application**
Warm Home Discount Scheme	Direct financial support to a lower energy bill. It was introduced to replace social tariffs in 2011. While some people are automatically granted this help, others must apply.	Mainly two groups of people are concerned by this measure that grants a 140 GBP rebate on energy bills: • Core group: low-income pensioners that receive a Guarantee Credit via the Pension Credit[428], i.e.: o People have reached State Pension age (66 or 67 depending on birth date); o People over State Pension age are getting Universal Credit (help to pay for living costs[429]). • Broad group households at risk of energy poverty. Five cases determine a person/household's belonging to the broad group[430]: (1) People receiving Income Support; (2) People receiving an Income-related Employment and Support Allowance; (3) People receiving an Income-based Jobseeker's Allowance; (4) People receiving child tax credit based on an annual income not exceeding 16.190 GBP. For these first four cases, in addition to allowances mentioned, people/households must either: - have parental responsibility for a child under the age of 5 who ordinarily resides with the people/household; - Or receive any one of the following: - Child tax credit which includes a disability or severe disability element; - A disabled child premium;

[423] (Department for Business, Energy & Industrial Strategy, 2019)

[424] This definition was introduced in 2013 and is in application in England. Officially, remaining countries part of the UK (Northern Ireland, Scotland and Wales) still use the old definition where a household is living in energy poverty if, to heat their home to a satisfactory standard, they spend more than 10% of their household income on fuel.

[425] Costs required to have a warm, well-lit home, with hot water and the running of appliances. An equivalisation factor is applied to reflect that households require different levels of energy depending on who lives in the property. This term encompasses various energy goods (e.g. natural gas).

[426] Residual income is defined as equivalised income after housing costs, tax and National Insurance. Equivalisation reflects that households have different spending requirements depending on who lives in the property.

[427] (Department for Business, Energy & Industrial Strategy, 2020)

[428] (UK Government, 2020)

[429] (UK Government, 2020)

[430] (OFGEM, 2018)

		- A disability premium enhanced disability premium or severe disability premium; - A pensioner premium, higher pensioner premium or enhanced pensioner premium. (5) People are receiving Universal Credit or having earned income between zero and 1.349 GBP in at least one of the relevant assessment periods, a rolling one-month period. Besides, the person must meet one of the three following conditions: - Have limited capability for work and/or work-related activity; - Be in receipt of the disabled child element; - Have parental responsibility for a child under the age of 5 who ordinarily resides with the person.
Winter Fuel Payment	Direct financial support to lower energy bill aiming elderly people.	One-off payment of 100 to 300 GBP to reduce heating bills for people meeting both following conditions: • Being born on or before 5 April 1954; • Having lived in the UK at least one day during the “qualifying week” (16 to 22 September 2019). In case the person did not live in the UK for the qualifying week, the person must have lived in Switzerland or a European Economic Area (EEA) country and have a genuine and enough link to the UK (work, facility, etc.) to qualify for this payment. Considering the potential variable amount, which depends on the age, household composition and living situation (private or care home) we present a range from a minimum of 100 GBP to a maximum of 300 GBP[431].
The Cold Weather Payment	Direct financial support to lower energy bill only offered during periods of extremely cold weather.	Payments of 25 GBP/week when the temperature drops below 0°C between 1 November and 31 March. To qualify, households must be getting one of the following allowances: • Pension Credit, • Income Support, • Income-based Jobseeker’s Allowance, • Income-related Employment and Support Allowance, • Universal Credit, • Support for Mortgage Interest. For all above-listed allowances, people/households must also meet the conditions listed for the Warm Home Discount Scheme. Considering the potential variable amount, we present a range from a minimum of 0 GBP (no days with temperature <0°C) to a maximum amount of 525 GBP (for 2019-2020, 21 full weeks with temperature <0°C).
The ECO scheme	This scheme helps to reduce carbon emissions and tackle energy poverty. The ECO scheme “has seen 4 iterations […]. The ECO3 scheme closed on 31 March 2022 and the ECO4 Order came into force in July 2022. ECO4 applies to measures installed from 1 April 2022 and will cover a four-year period until 31 March 2026.	To be eligible for the ECO scheme, households should at least benefit from[432]: • Child Benefit • Pension Guarantee Credit • Income-related Employment and Support Allowance (ESA) • Income-based Jobseeker’s Allowance (JSA) • Income Support • Tax Credits (Child Tax Credits and Working Tax Credits) • Universal Credit • Housing benefit • Pension credit saving credit

431 (UK Government, 2020)
432 https://www.ofgem.gov.uk/environmental-and-social-schemes/energy-company-obligation-eco/homeowners-and-tenants

Disposable income and living wage

The ***gross adjusted disposable income*** for the UK amounted for 25.115,17 EUR in 2021[433,434]. Besides, housing costs that now reach 27,60% of the UK's disposable income according to a recent study are deducted[435]. Consequently, we assess a corrected gross disposable income of 18.183,38 EUR.

The UK provides a living wage ("Universal Credit")[436] to help low-income people cover their living costs. To be entitled to this allowance, people must respect all below-listed criteria[437]:

- Have either no income or a low income, with a maximum of 16.000,00 GBP in savings;
- Not being in full-time paid work (<16 hours a week, and, if any, a partner working <24 hours a week);
- Not being eligible for Jobseeker's Allowance or Employment and Support Allowance;
- Living in England, Scotland or Wales;
- Be between 16 and legal pension age, and at least one of the following:
  - Pregnant;
  - A lone parent (including a lone adoptive parent) with a child under 5;
  - A lone foster parent with a child under 16;
  - A single person looking after a child under 16 before they're adopted;
  - A carer;
  - Be on maternity, paternity or parental leave;
  - Be unable to work and receiving Statutory Sick Pay, Incapacity Benefit or Severe Disablement Allowance;
  - Be in full-time education (not university), aged between 16 and 20, and a parent;
  - Be in full-time education (not university), aged between 16 and 20, and not living with a parent or someone acting as a parent;
  - Be a refugee learning English;
  - Be in custody or due to attend court or a tribunal.

As it is the case with the other countries in scope of this study, the UK provides to poverty-exposed citizens some form of revenue. In the UK, this revenue is called "Standard allowance". For a couple, this amount ranges from 416,45 GBP (for both people) if you live with your partner and are both under 25 years old to 525,72 GBP (for both people) if you live with your partner and either are 25 years old or above[438].

Extra amounts are granted for children, ranging from 244,58 GBP/month to 290,00 GBP per month depending on the birth date for the first child, and limited to 244,58 GBP/month for the second child and any other eligible children[439].

The minimum monthly amount that can be claimed by a household of four people (2 adults and 2 children) with social revenues in the UK is therefore estimated at 905,61 GBP (1.053,52 EUR) for a couple under 25 years old with two small kids whereas the maximum amount reaches 1.060,30 GBP (1.233,48 EUR) for a couple above 25 years old with 2 older children[440].

[433] As data relative to UK are not anymore displayed in reports from Eurostat since 2020, we used for a relevant comparison the 2021 official data provided by the UK government (21.589 GBP) and convert this amount to EUR using the standard ECB 2021 conversion rate of 0,85960 GBP/EUR.
(https://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=120.EXR.A.GBP.EUR.SP00.A)

[434] https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/crxs/ukea

[435] https://theintermediary.co.uk/2022/07/households-hit-as-mortgage-costs-now-account-for-28-of-disposable-income/v

[436] https://www.gov.uk/universal-credit/eligibility

[437] (UK Government, 2020)

[438] https://www.gov.uk/universal-credit/what-youll-get

[439] ibid

[440] We again use here the standard ECB 2021 conversion rate of 0,85960 GBP/EUR for the sake of consistency.

Energy effort rates comparison

Based on the above-mentioned information, we present four charts designed to compare effort rates of residential consumers to pay for their energy bills. The energy effort rate can be understood as “the share of total energy expenditure in the household's disposable income” (ONPE, 2020). The higher this share is, the more effort one makes to pay for the energy and the less can be spent on other goods and services.

It is important to note that the results presented in this section do not take into consideration one-off reductions on energy bill such as energy credit note in Belgium, energy vouchers in France or discount on the energy tax for electricity in the Netherlands. This is because the amount of those allowances can vary a lot depending on the households’ characteristics.

Energy effort rates compared to the average disposable income (housing costs deducted)

Disposable income reflects the purchasing power of households and their ability to invest in goods and services or save for the future, by accounting for taxes and social contributions and monetary or in-kind social benefits. With house prices and rents rising, the cost of housing this represents more than ever a significant share of household spending as it is shown below. To reflect more precisely the weight of the energy bill on household’s disposable incomes, the average share of housing costs is here retrieved from the disposable income as shown in the table below[441].

All data for EU countries were extracted from Eurostat at national level and are figures for 2021 as they represent the most recent data available[442]. For the UK, we had to use official data from the British government[443] and desktop research[444] as Eurostat do not include the UK in its dataset anymore. We then converted the amounts from GBP to EUR using the conversion rate mentioned in the ‘general assumptions’ section of this report. Using such an approach for the UK has some caveats as the amount retrieved cannot directly be adjusted with the purchasing power parities (PPP), but as the analysis is focused on the relative weight of the energy bill compared to the gross disposable income of households, we do not believe it has an impact on the conclusions provided in this study. This analysis allows us to measure the relative weight of the energy bill against the average disposable income for all countries in scope of this study.

Table 132: Adjusted gross disposable income of households per capita in EUR, housing costs deducted

	Belgium	Germany	France	Netherlands	UK
Adj. gross disposable income of households per capita, corrected of PPP[445] (EUR)	27.726,00	30.462,00	27.247,00	28.277,00	25.115,17[446]
Share of housing costs in disposable income (%)	17,60%	23,40%	17,40%	23,90%	27,60%[447]
Adj. gross disposable income of households per capita, housing costs deducted (EUR)	**22.846,22**	**23.333,89**	**22.506,02**	**21.518,80**	**18.183,38**

[441] It must be noted that we do not do the split here between Belgian’s regions. This limitation is dictated by the Eurostat data availability at national level only.

[442] https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-2b.html

[443] Source: https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/crxs/ukea

[444] For the proportion of disposable household income required to cover the share of housing costs, the following source is used : https://theintermediary.co.uk/2022/07/households-hit-as-mortgage-costs-now-account-for-28-of-disposable-income/

[445] https://ec.europa.eu/eurostat/databrowser/view/TEC00113/default/table?lang=en

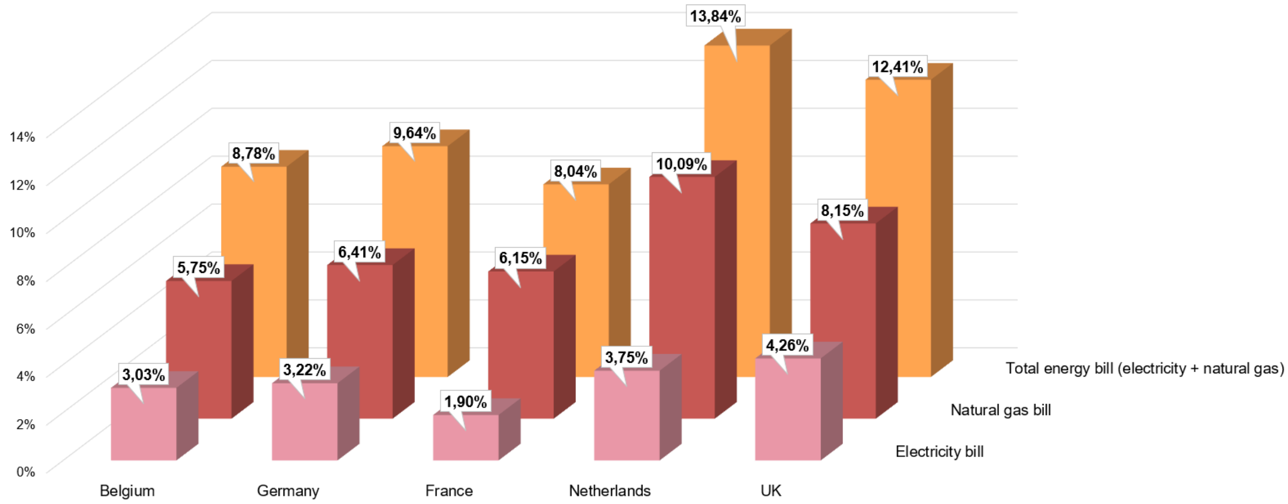
[446] As data relative to UK are not anymore displayed in reports from Eurostat since 2020, we used for a relevant comparison the 2021 official data provided by the UK government (21.589 GBP) and convert this amount to EUR using the standard ECB 2021 conversion rate of 0.85960 GBP/EUR

[447] https://theintermediary.co.uk/2022/07/households-hit-as-mortgage-costs-now-account-for-28-of-disposable-income/v

Taking the disposable income of households – housing costs deducted – as a basis, the figure below looks closer at the weight of the energy bill on a household with an average disposable income (2 working people). A split is done between the weight of electricity and natural gas.

When we compare the weight of the total energy bill against the average disposable income – housing costs deducted – for countries in scope of the study, we can see that for all countries the electricity bill clearly has a lower impact on budget than the natural gas invoice.

Figure 100: Importance of energy bill compared to average disposable income (housing costs deducted, in %)



France is the country where the electricity bill weights the least, with less than 2% of the annual disposable income (housing costs deducted). Belgium comes second with an average of around 3% of the disposable income. Germany and Netherlands come after, while the UK is the country where the electricity bill weights the most with more than 4% of the disposable income.

When looking at natural gas, Belgium is the country where the bill weights the least in comparison with disposable income with an average of less than 6%. France comes second, closely followed by Germany, both being around 6%. The UK, and to a greater extent the Netherlands, have the natural gas bill weighting the most with respectively more than 8% and more than 10% of the disposable income.

All in all, France is the country where the total weight of the energy bill is the lowest in comparison with disposable income (around 8%), mainly due to its competitive advantage regarding electricity. Belgium comes second with a figure around 9%. The UK and the Netherland are the countries where the energy bill is the heaviest, with more than 12% and almost 14% respectively.

Energy effort rates compared to disposable incomes: average income vs. low income

In a second analysis, we aim to compare the countries' average energy bill against:

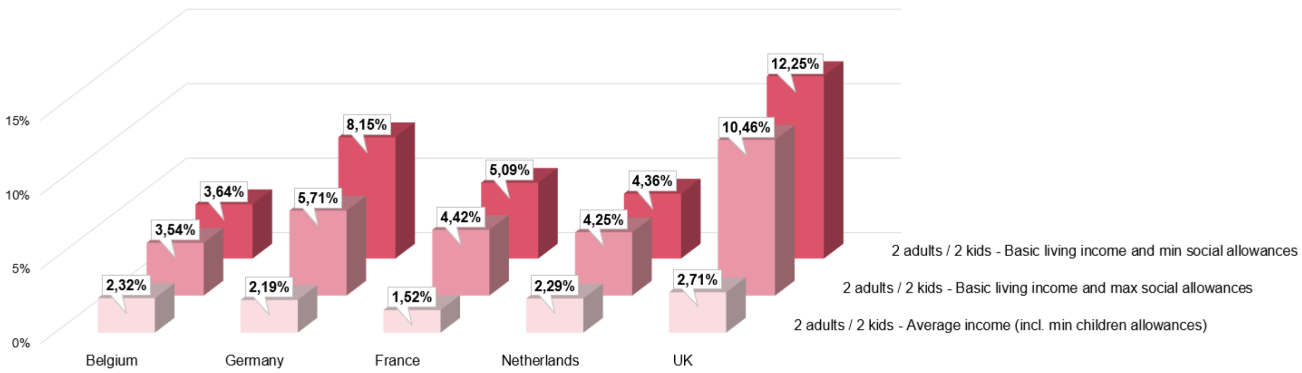
(1) The revenues of a household made of 2 adults perceiving the average country income, and 2 children allowing them to perceive the minimum available level of children allowances;
(2) The revenues of a household made of 2 adults, both perceiving the country's basic living income, and 2 children allowing them to perceive the minimum level of social allowances.
(3) The revenues of a household made of 2 adults, both perceiving the country's basic living income, and 2 children allowing them to perceive the maximum level of social allowances.

This allows us to assess the weight of the average energy bill on people earning the country's average income against the impact it has on the most vulnerable people. To do so, based on the above-mentioned research, all social measures that can be quantified are added to the basic income that our typical household (2 adult parents and 2 children) could earn without having other sources of revenue. We believe that this situation represents a worst-case scenario, but it allows us to provide a rather good overview of the impact on the energy bill on the most exposed consumers.

This time we do not deduct the share of housing from the disposable income. As most households with minimum incomes also often benefit from significant aid in that area too, that would indeed provide a biased picture of reality. By doing so, the relative weight of the energy bill for a household with 2 adults earning the country's average income will therefore decreases compared to the previous figure[448].

Figure below show the electricity effort rate compared to the living income for the 3 scenarios mentioned.

Figure 101: Electricity effort rate compared to living income (in %)



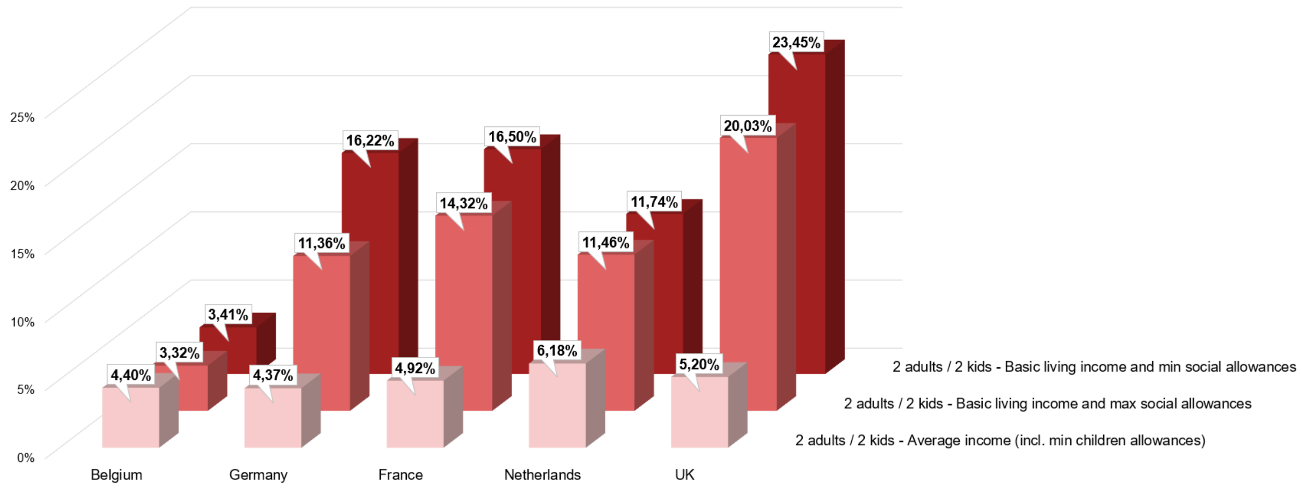
When comparing the effort rate for electricity across countries for a household with an average income, we can see that France is once again the country where the electricity bill weights proportionally the least, followed by Germany. The Netherlands and Belgium stand in the middle of the pack. The UK comes last, with a weight of the electricity bill almost twice as high as is France.

Things change however when we consider households with the lowest incomes. In that case, Belgium is able to maintain a rather low weight of the electricity bill compared to a basic income in the country thanks to an available social tariff, keeping the weight of the electricity bill under 4% of the available income. France and the Netherlands come next, with an electricity bill counting around for 4-5% of the available income depending on the amount of social allowances received. Germany comes next with a higher effort rate ranging from around 6% to 8%. The UK's situation is much worse than before when it comes to low-income households. In this case the electricity bill weighs indeed about 10% to 12% of the household available living income.

[448] On top of that, the minimal social measures associated with the 2 kids also help to increase the total income available, even if often only at a margin.

If we focus on the natural gas bill, the results are quite similar even if the order of magnitude is different. As already mentioned, the gas bill weighs more heavily on the household budget than the electricity bill. The figure below illustrates that.

Figure 102: Natural gas effort rate compared to living income (in %)

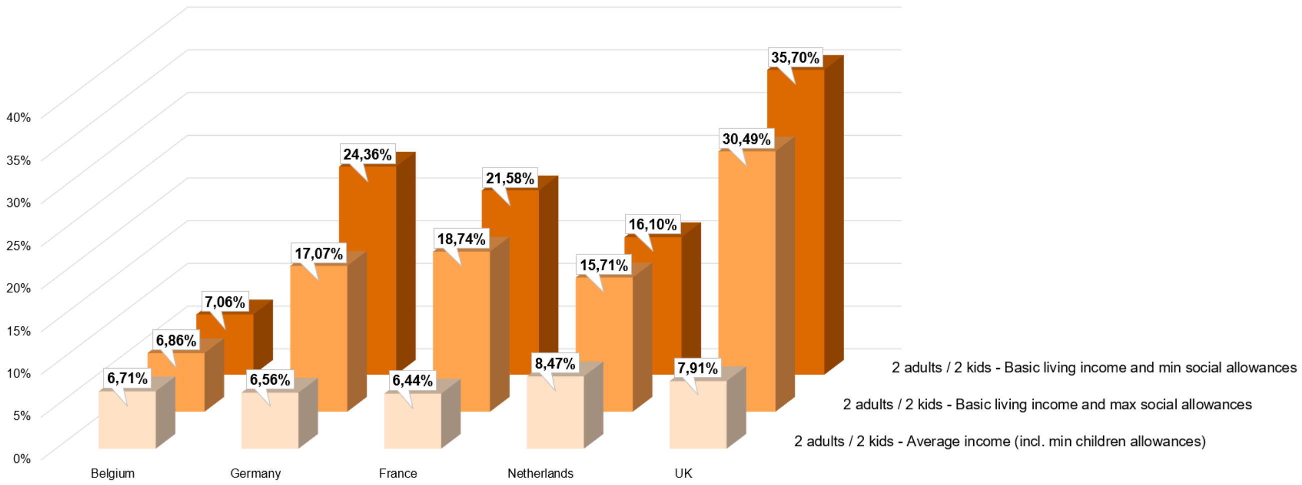


When comparing the effort rate for natural gas across countries for a household with an average income, we can see that Belgium is now the country where the natural gas bill weights proportionally the least, followed by Germany. France comes next, followed by the UK. The Netherlands comes last, with an effort rate for the natural gas weighting around 40% higher than in Belgium.

Things change however when we consider households with the lowest incomes. In that case, Belgium is once again able to maintain a low weight of the natural gas bill compared to a basic income thanks to an available social tariff (the effort rate is even lower than for a household with average income). This social tariff helps to keep the weight of the natural gas bill under 3,5%. Germany and the Netherlands come next, with a natural gas bill counting for a bit more than 11% of the available income depending on whether maximum social allowances are received or not. If the position of the Netherlands doesn't change drastically when minimum social allowances apply (still below 12%), the situation worsens for Germany in such a scenario with a weight of the natural gas bill that can reach more that 16% of the basic living income. France comes next with an effort rate ranging from 14% to 16,5% for households with the lowest incomes. Finally, the UK is once again the country with the heaviest bill in relation to living income for the most exposed households, with figures ranging from 20% to more than 23% of available income. The natural gas bill alone could therefore account for almost a quarter of the available budget for the UK's households most exposed to energy poverty.

All in all, if we look at the total picture by adding up the electricity and natural gas bills, the main observations remain relevant as shown in the figure below:

Figure 103: Total energy bill effort rate compared to living income (in %)



When comparing the effort rate for the total energy bill across countries for a household with an average income, we can see that France is the region where the energy bill weights proportionally the least, closely followed by Germany and Belgium. The UK comes next, followed by the Netherlands, which shows an effort rate around 30% higher than in France.

Unsurprisingly, the situation becomes much more complicated when we look at households with the lowest living incomes. In that case, Belgium is able to maintain a rather low weight of the energy bill compared to a basic income in the country thanks to an available social tariff. This helps to keep the weight of the energy bill almost at the same level as for a household with average income.. The Netherlands come next, with a total energy bill counting for about 16% of the available income depending on whether maximum social allowances are received or not. Germany comes next with a total energy bill weighting for approximately 17% when maximum social allowances can be perceived. The situation is however much worse if only minimum social allowances can be perceived. In that case, the energy bill weights for around a quarter of available living income. France comes next with an effort rate ranging from around 19% to 22% for households with the lowest incomes. Finally, the UK is once again the country with the heaviest bill in relation to living income for the most exposed households, with figures ranging from 30% to more than 35% of available income. The total energy bill in the UK could therefore have a disproportionate burden on households most at risk of energy poverty.

Note: The approach followed in this section has limitations as it does not necessarily correspond to the consumption profile of some people in the situation of energy poverty (such as an isolated person without children for instance). Furthermore, it doesn't take either the fact that some more exposed people would decide to consume less energy to lower their energy bill for example. The ultimate objective of this chapter being to determine the effort rate needed to pay the energy bill (and compare it across countries to assess the impact of the energy bill in relative terms), we believe this approach is however robust enough to draw conclusions.

Conclusion

All countries in scope do provide financial support and/or social measures aimed at helping consumers having difficulties in supporting energy costs. From our analysis, it appears that the position of Belgium is better than other countries under review for the modest revenues thanks to a social tariff which is not available anywhere else. Even when this tariff is not applicable, Belgium remains among the lowest effort rates for both electricity and gas, being only overtaken by France where electricity is much cheaper.

Within Belgium, Flanders is the region where the energy bill weights the less, followed by Brussels and finally Wallonia. At the other end of the spectrum, the UK is the country where the energy bill weights the most, whether a household has a minimum income or an average income.

The governmental intervention through the granting of a living income and social measures aimed at reducing one's energy expenses have a significant impact on lowering the financial burden for households, but the lowest incomes obviously remain the most vulnerable to the current energy crisis.

As Belgium displays the highest living incomes between the countries analysed when housing costs are deducted, it directly helps dilute the efforts made to pay for energy. Besides, the existing and extended social tariff further supports vulnerable households as this significantly reduces their energy expenses.

Within Belgium and considering both living incomes, a tendency can be highlighted as Flanders and Brussels tend to display lower effort rates than Wallonia for both electricity and gas. The effort rates of the three Belgian regions tend to converge once social measures are considered, for both electricity and gas.

Limitations of the analysis

This analysis has potential limitations that were already outlined in the previous pages. The study scope covers the comparison of households' energy effort rates depending on their disposable income. Various scenarios can be elaborated to reflect the weight of energy prices against disposable income. By using figures at national level, we cannot take into consideration the regional differences in disposable incomes. Furthermore, taking the assumption that a standard household is made of two working people that do earn their country's average disposable income is also a shortcut.

Then, minimum and maximum basic living incomes were estimated for each country based on a two-adults and two-children household only earning the minimum income available in the country. If a clear direction was given by considering all basic incomes and potential allowances for this type of household, no real common measure exists between the countries and regions under study and the observed situation may be completely different for people living alone for example. This entails increasing comparison difficulties. Moreover, we do not include here potentially "extreme" cases (e.g. highest level of child disability) as it may not be highly representative of a country or region's situation as few families might be concerned by all the measures in effect simultaneously.

At the reading of this analysis' conclusions, one must bear in mind the limitations mentioned here before. In this regard, complementary research must be conducted to consolidate the results obtained. As such, conducting similar research based on the first deciles of the average household income from the E-SILC study could offer a harmonised measure to derive households' lower incomes. Besides, considering the number of households impacted by each governmental intervention would be necessary. We notably refer to studies from the CEER[449] to do so.

[449] (CEER, 2021)

9. Competitiveness of the Belgian industry in terms of energy prices

9. Competitiveness of the Belgian industry in terms of energy prices

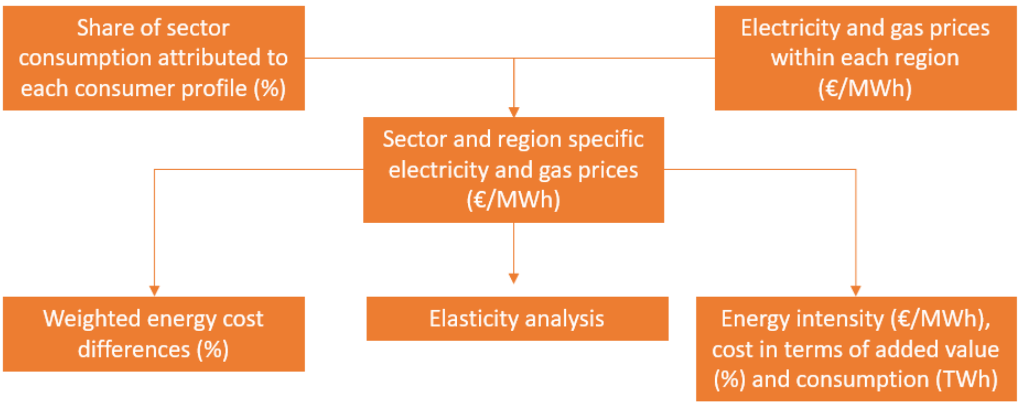
Competitiveness analysis

Methodology

When writing the 2020 edition of this report, the five most prominent industrial sectors in Belgium in the scope of an energy price comparison were selected: the chemical industry (NACE 20), the pharmaceutical industry (NACE 21), the basic metal industry (NACE 24), the food & beverages industry (NACE 10-12) and the coke and petroleum products (NACE 23) industry[450]. In the previous chapters of this report, the gas and electricity prices were compared with those of Belgium's neighbouring countries: Germany, France, the Netherlands, and the UK.

In this chapter, the information gathered in previous chapters is combined to analyse the competitiveness of the five most important sectors in Belgium. The reasoning behind the analysis is detailed in the following figure.

Figure 104: Methodology flowchart



The electricity and natural gas prices in Flanders, Wallonia and Brussels are first combined with the distribution of the different consumer profiles over the five most important sectors, resulting in sector- and region-specific electricity and natural gas prices. Then, these prices are used to calculate two important variables, through two separate pathways. The first pathway computes a weighted energy cost difference, which combines electricity and natural gas prices in one single measure. It makes it possible to compare energy prices of a certain sector (within a certain region) with that of the European average. The second pathway elaborates on the energy intensity, which expresses the energy cost of a certain sector and region in terms of added value.

This chapter is structured around this flow chart, which is further detailed in the following sections.

[450] In this section, we will use this order to present the results, according to the importance order of the mentioned sectors.

Sector- and region-specific electricity and natural gas prices

In the previous chapters, the electricity and natural gas prices for the Belgian three regions were collected. Since the aim of this chapter is to analyse the competitiveness of these prices for the five most important sectors, it is necessary to define a method which uses these regional prices and expresses them at the sectoral level. That is done by combining the regional electricity and natural gas prices with the breakdown of consumer profiles by sector. They are based on data provided by the CREG[451] and show how the consumer profiles are broken down by sector[452], which consumer profile is the most predominant within each sector and therefore which one has the greatest impact on electricity and natural gas prices for that sector.

The relative frequency of each consumer profile per sector (obtained by multiplying the absolute number of profiles by the consumption of each profile[453] [454] and dividing it by the total consumption per sector) is presented in the tables below. As it can be seen in the following table, E4 is the predominant profile in the food and beverages sector (NACE 10-12) and in the manufacture of chemicals (NACE 20), while it is E3 for the petroleum products (NACE 19), pharmaceuticals (NACE 21) and basic metals (NACE 24) sectors. The prices of these predominant consumer profiles have the largest effect on electricity prices for each of the first five sectors in each region. Table 132 shows that in all sectors, the G2 profile is predominant in the chemicals (NACE 20), the pharmaceuticals (NACE 21) and the basic metals (NACE 24) sectors, while G1 profile is preponderant for the food and beverages (NACE 10-12) and the petroleum products (NACE 19).

The first column, for each profile, of the table underneath refers to absolute frequencies (#), while the second column, for each profile, of the same table refers to relative frequencies weighted by consumption profiles (%).

Table 133: Distribution of electric consumer profiles per sector

Code NACE - Sector	E0 (2-10 GWh/year)[455]		E1 (10-17,5 GWh/year)		E2 (17,5-62,5 GWh/year)		E3 (62,5 -300 GWh/year)		E4 (>300 GWh/year)	
	#	%	#	%	#	%	#	%	#	%
NACE–20 - Manufacture of chemicals and chemical products	303	9,2%	19	3,7%	29	13,6%	15	42,7%	2	30,8%
NACE–21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	47	15,2%	1	2,6%	6	25,9%	3	56,2%	0	0,0%
NACE–24 - Manufacture of basic metals	149	6,2%	8	2,1%	9	5,5%	11	36,5%	4	49,7%
NACE 10–12 - Manufacture of food products; beverages and tobacco products	481	27,5%	51	19,6%	47	40,7%	5	12,2%	0	0,0%
NACE–19 - Manufacture of coke and refined petroleum products	42	2,8%	1	0,5%	1	2,0%	2	13,5%	5	81,2%

Source: CREG (2019), PwC Computations

Table 134: Distribution of gas consumer profiles per sector

[451] The calculations were made based on the same data as in the 2022 report.

[452] To identify the proportion of E0 companies, we used a specific methodology. The “Tableau de bord des PME et des entrepreneurs indépendants 2019” states that SMEs represent 99,8% of the total companies (619.414) in Belgium. Thanks to this report, we extrapolated the number of big companies and thanks to the CREG data, we extrapolated the proportion of big companies in the E0 profile.

[453] The data in both tables based on billing data from the CREG for all consumers with an offtake of more than 2 GWh of electricity or 1,25 GWh of natural gas per year.

[454] For electricity – E0: 2GWh, E1: 10GWh, E2: 25 GWh, E3: 100GWh, E4: 500GWh; For natural gas – G0: 1,25GWh, G1: 100GWh, G2: 250 GWh

[455] The split between E0 and E1 is different from the other profiles split, due to a lack of data for companies consuming less than 10 GWh/year. We estimated the E0 number of companies and relative consumption based on the Belgian companies' landscape while the other profiles are based on data given by the CREG

Code NACE - Sector	G0 (2-10 GWh/year)		G1 (10-17,5 GWh/year)		G2 (17,5-62,5 GWh/year)	
	#	%	#	%	#	%
NACE–20 - Manufacture of chemicals and chemical products	219	1,9%	43	29,5%	4	68,6%
NACE–21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	56	1,7%	11	14,0%	1	84,3%
NACE–24 - Manufacture of basic metals	75	2,3%	15	36,6%	1	61,1%
NACE 10–12 - Manufacture of food products; beverages and tobacco products	714	5,5%	153	94,5%	0	0,0%
NACE–19 - Manufacture of coke and refined petroleum products	126	3,0%	26	49,5%	1	47,6%

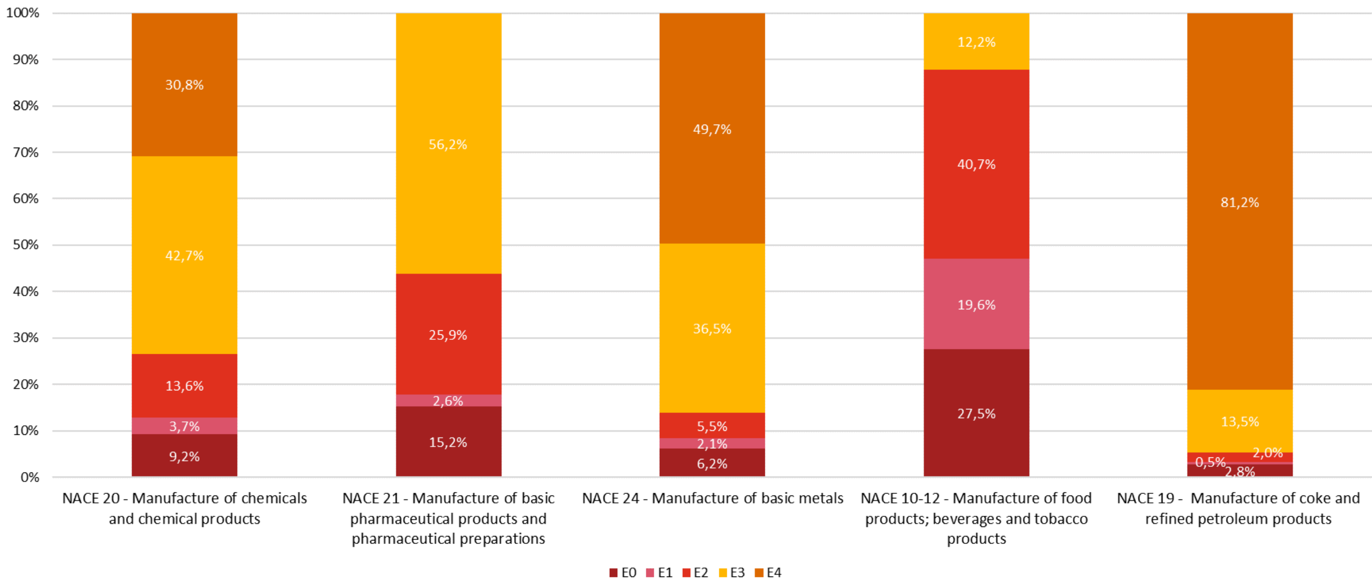
Source: CREG (2019), PwC Computations

As an example, the absolute frequencies for the food and beverage (NACE 10-12) sector are 481 for E0. This means that 481 consumers have a quantity of invoiced electricity like the consumption of profile E0, 51 consumers for E1, 47 consumers for E2, 5 consumers for E3 and 0 consumers for E4. Multiplying these numbers by their respective consumption and summing them, results in theoretical total electricity consumption on the sector level of 3.492 GWh. Expressed in relative frequencies, 27,5% of the total consumption is represented by profile E0, 19,6% by E1, 40,7% by E2, 12,2% by E3 and 0% by E4.

For natural gas, there are 714 consumers of profile G0, 153 for G1 and 0 for G2. Multiplying these numbers by their consumption and summing both up, results in total theoretical consumption for the sector of 16.192 GWh. This reflects a relative frequency of 5,5% for G0, 94,5% for G1 and 0% for G2.

Along with the same logic, the relative frequencies of the consumer profiles for the other sectors have been calculated and are presented again in the two following figures. As it is clear from the figure below, profile E3 is the predominant profile in most of the sectors (NACE 20, 21 and relatively predominant for NACE 24), while for the food and beverages sector (NACE 10-12) it is profile E2 and for the NACE 19 (petroleum products) it is profile E4, easily explained by the energy-intensity nature of the sector.

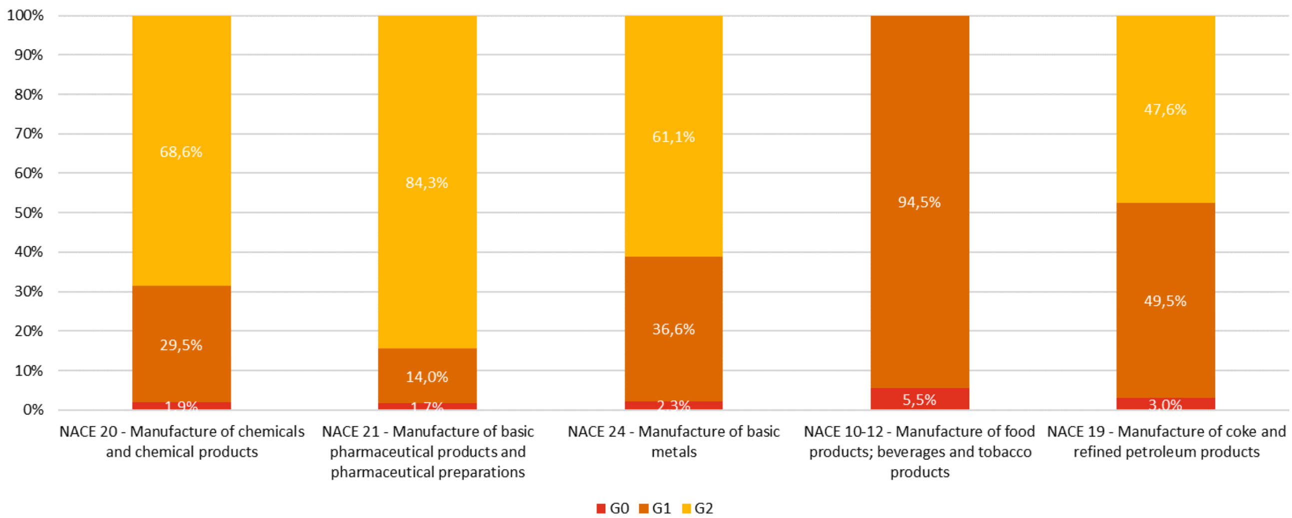
Figure 105: Share of sectoral electricity consumption attributed to each consumer profile



Source: CREG (2019), PwC Computations

From the figure below, it is observed that for half of the sectors, G2 is the profile with the highest relative frequency (NACE 20, 21 and 24). Although there are just a few G2 consumer profiles represented in the different sectors, they can have a substantial relative frequency, caused by their high volume of natural gas consumption; this is observed in the pharmaceuticals sectors where one company accounts for more than 80% of the total consumption of this sector.

Figure 106: Share of sectoral natural gas consumption attributed to each consumer profile



Source: CREG (2019), PwC Calculations

As previously stated, these relative frequencies can be used together with the electricity and natural gas prices for each region to calculate sector and region-specific electricity and natural gas prices (in EUR/MWh). This is done by summing the multiplications of the prices retrieved for each consumer profile and their relative frequencies according to the formulas below:

$$P_{elec}\ for\ Sector_i\ in\ Region_j = \sum_{X=0}^{4} (Price\ for\ E_X\ in\ Region_j * Relative\ frequency\ of\ E_X\ in\ Sector_i)$$

$$P_{gas}\ for\ Sector_i\ in\ Region_j = \sum_{X=0}^{2} (Price\ for\ G_Y\ in\ Region_j * Relative\ frequency\ of\ G_Y\ in\ Sector_i)$$

When comparing those regions and sector-specific prices to the European average[456], they can be expressed as price differences with the European average. We have calculated the average prices of electricity and natural gas in the neighbouring countries according to the following formulas[457]:

$$European\ average\ of\ P_{elec}\ for\ Sector_i = \sum_{X=0}^{4} (Average\ price\ for\ E_X\ in\ neighbouring\ countries * Relative\ frequency\ of\ E_X\ in\ Sector_i)$$

[456] The European average throughout this section refers to the average of Germany (average of the four regions for electricity in Germany), France, the Netherlands, and the United Kingdom, for both electricity and natural gas.

[457] We have used the same share of sectoral electricity and natural gas consumption attributed to each consumer profile to calculate the average price of electricity and natural gas in the neighbouring countries. This way we assume that the different consumer profiles are equally distributed in the sectors under scope of the neighbouring countries.

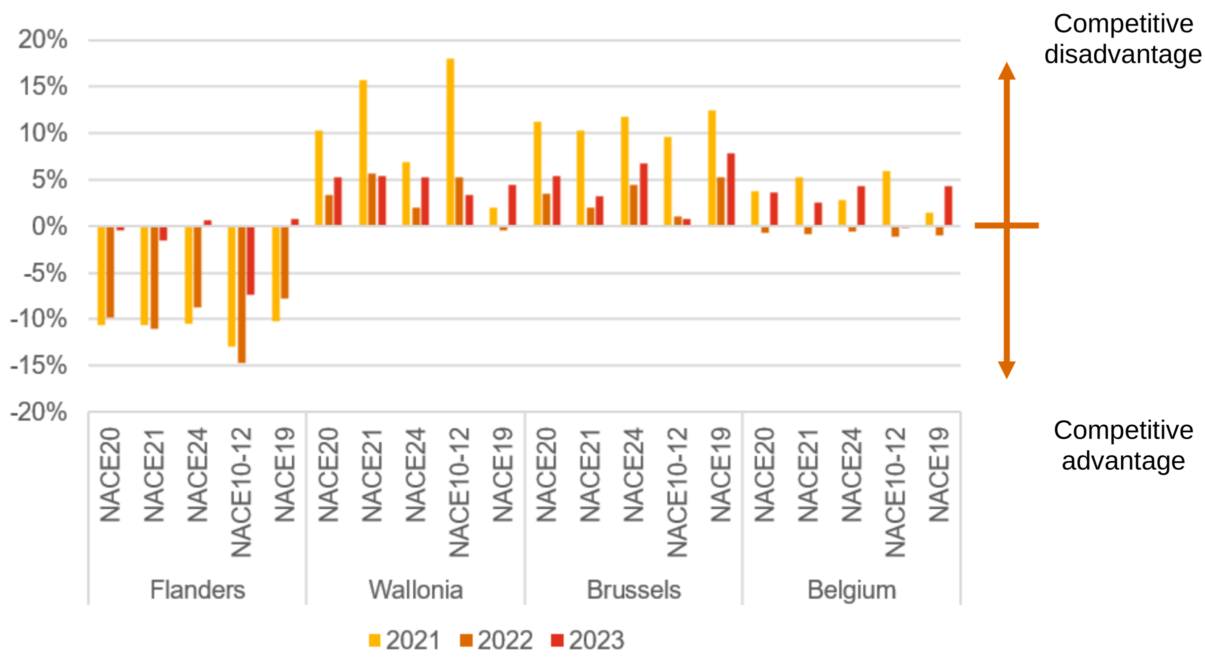
$$European\ average\ of\ P_{gas}\ for\ Sector_i = \sum_{X=0}^{2}(Average\ price\ for\ G_Y\ in\ neighbouring\ countries * Relative\ frequency\ of\ G_Y\ in\ Sector_i)$$

Electricity and natural gas price differences (in %) measure the difference in price for a certain sector *i*, in a certain region *j* with the European average. These electricity and natural gas price differences in relation to the average in Belgium's regions and neighbouring countries, specific to a sector or region, are presented below and are illustrated in Figure 110 (for electro-intensive consumers), Figure 111 (for non-electro-intensive consumers) and Figure 112 for natural gas consumers.

$$X_{ij} = \left(\frac{P_{elec}\ in\ Sector_i\ in\ Region_j\ - European\ average\ of\ P_{elec}\ in\ Sector_i}{European\ average\ of\ P_{elec}\ in\ Sector_i}\right)$$

$$Y_{ij} = \left(\frac{P_{gas}\ in\ Sector_i\ in\ Region_j\ - European\ average\ of\ P_{gas}\ in\ Sector_i}{European\ average\ of\ P_{gas}\ in\ Sector_i}\right)$$

Figure 107: Electricity price differences for electro-intensive consumers compared with the average in the neighbouring countries

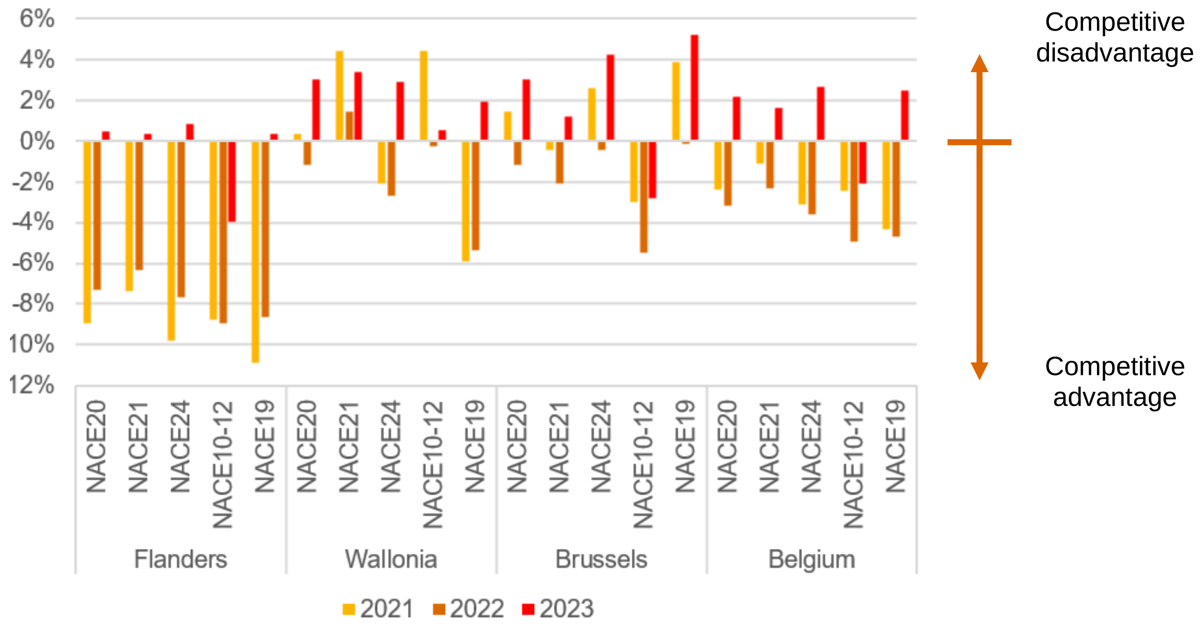


Source: PwC Calculations (2023)

One can observe on the above figure, that electricity price differences differ substantially from sector to sector and region to region. Belgium globally faces a competitive disadvantage when it comes to comparing electro-intensive consumers. Flanders appears to be the most competitive region in 2023 in Belgium, and in most sectors faces a competitive advantage compared to our European average. The reason is the cap on the cost of the green certificates which helps in reducing the electricity bill in Flanders for the industrial profiles. The cap instituted in Flanders leaves the NACE 10-12 as the most significant advantage for Flanders whereas the NACE 19 and 24 sectors are the smallest from all studied sectors. Flanders welcomes relatively more companies in the food manufacturing industry, compared to Wallonia and Brussels. Conversely, Brussels and Wallonia, regarding all sectors, are relatively non-competitive, with NACE 19 being, as in Flanders but with different proportions, the least competitive sector in Brussels, and NACE 21 in Wallonia. In Wallonia the sector NACE 10-12 has a tight competitive advantage in 2023. In the case of Brussels, this region is probably a theoretical case due to the limited number of industries on its territory, but the same outcome is observed.

Regarding the evolution of competitiveness[458], there is an important decrease in competitiveness for all three Belgium's regions, except for some specific sectors where competitiveness slightly increases (one sector in Wallonia and one in Brussels). Like the conclusions already drawn in "Chapter 6: Presentation of results", in 2023 we observe a slight convergence among the European regions/countries under review because of the general increase of the commodity cost. Belgium has seen its situation improving between the years 2021 and 2022, facing a higher competitive advantage in 2022, all sectors included. In 2023, on the other hand, both Wallonia and Brussels have seen their competitive situation decreasing for all sectors, compared the steep increase in competitiveness they benefitted from in 2022.

Figure 108: Electricity price differences for non-electro-intensive consumers compared with the average in the neighbouring countries



Source: PwC Calculations (2023)

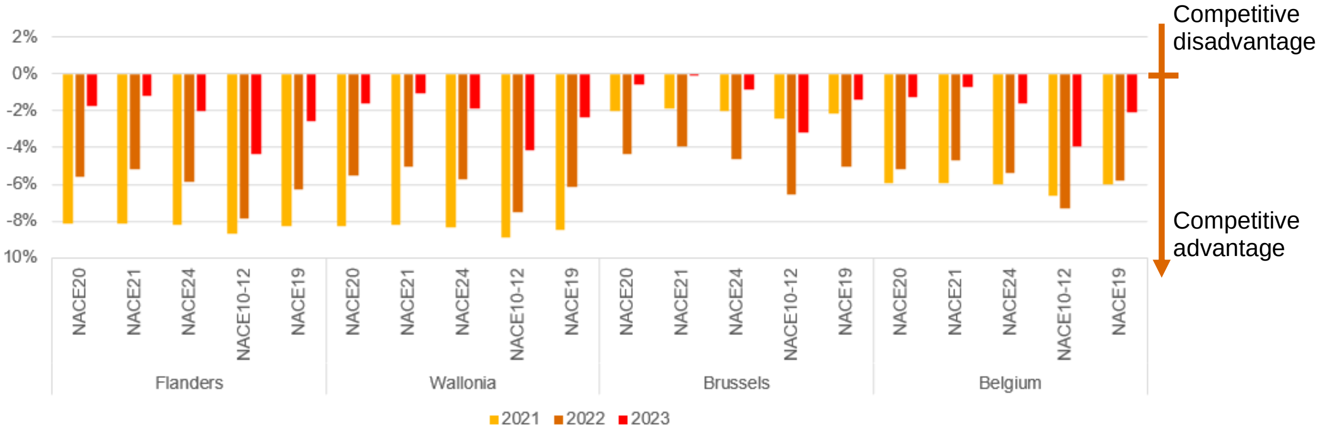
From the figure above, one can observe that Flanders still displays a competitive advantage in 2023, for the NACE 10-12 sectors, when looking at non-electro-intensive industries (similarly to Brussels). However, its competitive position changed to a competitive disadvantage for all other sectors. In Belgium, Flanders remains the most competitive region among all, whereas Wallonia is the least competitive, by a very slight margin, which changed from last year with Brussels being the least overall competitive in 2022. Overall, Belgium is today less competitive than the neighbouring countries.

The most competitive sectors are identical for electro-intensive and non-electro-intensive industries in Flanders, Brussels and Wallonia: NACE 10-12. Overall, Belgium's competitiveness has decreased for non-electro intensive consumers. Like the conclusions drawn for the electro-intensive profiles, in 2023 we observe a slight convergence of the regions/countries under review due to the general increase of the commodity cost.

When comparing the two figures regarding the electricity price differences, we observe that non-electro intensive profiles in Belgium have now a competitive advantage, which was not the case in 2022. This is due to the smaller decreases in Wallonia and Brussels, compensating for the larger decrease in competitiveness of Flanders this year. Regarding electro intensive profiles, we see that competitiveness decreases as well for most of the sectors under review.

[458] When possible data for 2021, 2022 and 2023 has been corrected to include UK in the European average, but other computation adaptations done in this year report might lead to some inconsistencies with the previous years when fixes were not possible to be done retroactively to compute the European average. This remark is valid for all the figures below where a comparison with previous years is shown.

Figure 109: Natural gas price differences for natural gas consumers in comparison with the average in the neighbouring countries



Source: PwC Calculations (2023)

From the figure above, it can be observed that natural gas prices – generalised on a sectoral level - are more competitive in Belgium than in the neighbouring countries, for all sectors and in all regions. Brussels is the region with generally lower competitiveness. However, while Belgium retains a competitive advantage in all sectors, this advantage has decreased over the past three years. This can be explained by the overall convergence of the gas bill among the regions/countries under review due to the general increase in the commodity cost observed in the past years.

Electro-intensive and non-electro-intensive consumers

In the previous and following sections, two different results in terms of energy price differences are presented: one shows the comparison within electro-intensive consumers, and the other shows the comparison within non-electro-intensive consumers. The first, valid for the electro-intensive consumer, compares prices in each region of Belgium with the lower range of prices observed in neighbouring countries; assuming that, in each of the neighbouring countries, the 'competitors' of Belgian industrial consumers meet the national electro-intensity criteria and therefore benefit from significant reductions in several components of the electricity price, as shown in the following table.

Table 135: National electro-intensity criteria

Country/Region	Criteria
Germany	For consumers of most industrial sectors: when electricity cost >14% of gross value added.
The Netherlands	Industrial consumers classified as being energy-intensive and concluded a multiple-year agreement with the Dutch government to save energy by improving their energy efficiency[459].
France	Substantial reductions exist for industrial consumers where the CSPE (of 22,50 EUR/MWh) represents at least 0,50% of their value added. For example, for a consumer of 10 GWh/year, a value added of 45 MEUR or less in the annual accounts is necessary to qualify for this criterion (i.e. the CSPE is at least 0,50% of the value added).
Belgium	Flanders: Reductions exist for industrial consumers with an electro-intensity of more than 20 % for the sectors listed in Annexes 3 and 5 of the EEAG (cap of 0,50 % of gross value added) and for all consumers belonging to the sectors listed only in Annexe 3 of the EEAG (cap of 4 % of gross value added).[460] In addition, industrial consumers from the three regions for both electricity and natural gas can be exempted from the federal special excise duty. In fact, according to Art. 429.§ 1er of the law from 27th December 2004[461] an exemption is foreseen when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures.

[459] An energy-intensive enterprise is an enterprise for which energy or electricity costs represent more than 3 % of the total value of production or for which energy and mineral oil taxes represent at least 0,5 % of the value added. (Overheid.nl, 2020)
[460] Only for industry (NACE 5-33) and deep frost alimentary (46391 and 52100) and Cargo handling in seaports (NACE 52241).
[461] https://www.ejustice.just.fgov.be/eli/loi/2004/12/27/2004021170/justel

The second result, on the contrary, is valid for non-electro-intensive industrial consumers in Belgium. It compares prices in the three Belgian regions with the upper range of prices observed in neighbouring countries, assuming that, in each of the neighbouring countries, the “competitors” of Belgian industrial consumers do not meet the national electro-intensity criteria and therefore pay the maximum price.

Whenever a series of results in neighbouring countries was available, we compared the prices in the three Belgian regions to the middle of the range of neighbouring countries.

At the Belgian level, there is a lack of publicly available information, making it impossible to identify the importance of electro-intensive enterprises in each of the industrial sectors studied. However, it is possible to give an indication at the purely macroeconomic level as to the electro-intensity (and natural gas intensity) of the sector. It must be made clear that behind these figures, at the macroeconomic level, lies a great complexity in terms of specific sub-sectors and consumer profiles. They do, however, highlight the sectoral energy intensity in Belgium and the severity of the criteria in neighbouring countries.

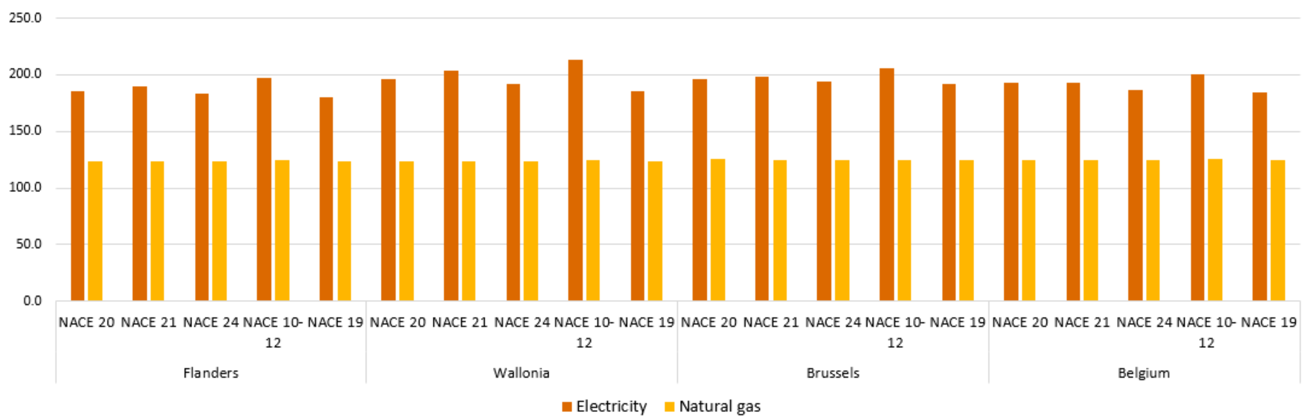
To get an idea of the relationship between the electro-intensity criteria of the neighbouring countries and the level of electro-intensity in Belgium and its 5 main sectors, we first introduce in this section the concept of energy cost based on:

- The electricity and natural gas prices for each sector and region (EUR/MWh) on the one hand (Figure 110);
- Energy intensity or MWh/EUR of value added for both electricity and natural gas per sector on the other hand (Figure 111).

The cost of energy reflects the cost of electricity and natural gas for the sector as a whole in terms of value added.

As it can be seen in the following figure, electricity prices are the highest for the NACE 10-12, followed by NACE 21 due to important energy consumption with a high added value created per MWh for NACE 21. Natural gas prices present a flattened curve with similar price levels among sectors. NACE 10-12 is highest for natural gas too, with NACE 19 on second place.

Figure 110: Sector and region-specific electricity and natural gas prices in 2023[462]

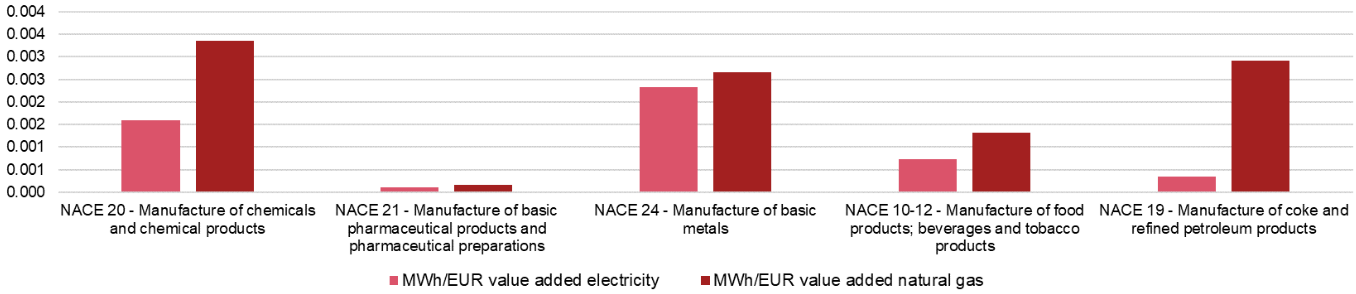


Source: PwC Calculations (2023)

[462] This graph is based on average price values between electro-intensive consumers and non-electro-intensive consumers

As shown in Figure 111, the energy intensity is higher for natural gas than for electricity and varies depending on the sector. Sectors with high values in MWh/EUR value added are considered as energy-intensive, as is the case for NACE 24 and NACE 20 regarding natural gas. NACE 19 seems to be a contrasting case: it is the most natural gas-intensive sector, whereas it is one of the lowest electricity-intensive sectors when talking about these 5 sectors.

Figure 111: Energy intensity per sector in Belgium in 2022[463]



Source: Federal Planning Bureau, Eurostat (2022), PwC Calculations

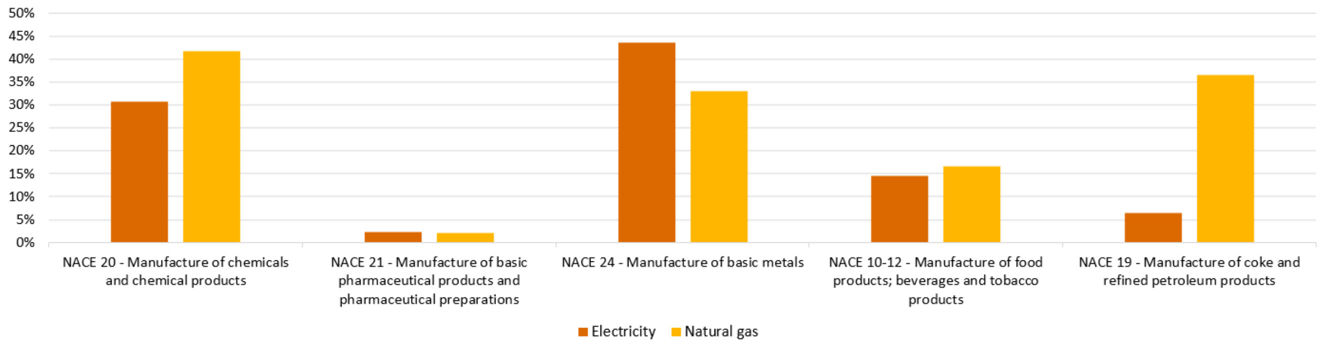
Combining sector- and region-specific electricity and natural gas prices with energy intensity figures produces a measure that represents the cost of electricity or natural gas as a percentage of value added (presented in

Figure 112). These data are extracted according to the following formulas:

$$Electricity\ cost\ for\ Sector\ i\ in\ Region\ j\ (\%\ of\ added\ value) \\ = P_{elec}\ for\ Sector\ i\ in\ Region\ j * Energy\ intensity\ (electricity)\ for\ Sector\ i$$

$$Natural\ gas\ cost\ for\ Sector\ i\ in\ Region\ j\ (\%\ of\ added\ value) \\ = P_{gas}\ for\ Sector\ i\ in\ Region\ j * Energy\ intensit\ (natural\ gas) for\ Sector\ i$$

Figure 112: Energy cost as % of value added in Belgium in 2022



Source: Federal Planning Bureau, Eurostat (2022), PwC Calculations

Similarly to the previous year, the figure above shows that natural gas cost as a percentage of value added is now higher than that of electricity, knowing that natural gas is relatively more consumed in the production process than electricity. This is due to the same relative increase of prices for natural gas compared to electricity in 2023, and the fact that the consumption of natural gas per euro of value added is slightly higher than that of electricity. Furthermore, it can be observed that the cost of gas in relation to value added is highest for the NACE 20 and NACE 19 sectors in all regions, while the cost of energy, in general, is lowest for the NACE 21 sectors in Belgium.

As mentioned above, in Flanders, Germany, France and the Netherlands, certain industrial consumers can claim reductions or exemptions from their energy taxes, based on national criteria. Most of these criteria are related to

[463] The data gathered in 2022 were kept for this instance of the report.

the cost of energy as a percentage of value added. For example, in Germany, the criterion for a lower tax regime is the cost of electricity exceeding 14% of value added. As shown in the above figure, the sectors NACE 10-12, NACE 20 and NACE 24 are the three sectors in Belgium which achieve an electricity cost of more than 10% at sector level. However, as these are aggregated figures that hide information on the level of industrial consumers, some individual industrial consumers may have a higher-than-average electricity intensity and therefore must compete with the so-called electro-intensive consumers in neighbouring countries. As will be seen in the next section, these energy-intensive companies could be at a significant disadvantage compared to their European competitors.

Weighted energy cost differences

The graphical representation of the energy prices in the regions/countries under review are interesting to see what the origin of the cost differences are. However, they cannot tell us whether or not the cost of energy as a whole is advantageous. It depends on the amount of electricity and natural gas consumed throughout the production process. As this information is publicly available, we detail in this section how to combine the differences in electricity and natural gas prices with the consumption volumes of both types of energy into a single measure: the weighted energy cost difference. This measure compares the overall cost of energy in each sector and region with the European average[464]. If an industrial company consumes a lot of electricity and almost no natural gas during its process, it is highly likely that electricity prices will have a significant impact on its energy bill.

The weighted energy cost difference is calculated according to the below formulas[465]. The two first formulas are helpful to better understand the final computation, which is the relative energy cost difference expressed in percentage

$$Energy\ cost\ difference\ for\ Sector_i\ in\ Region_j\ \left(in\ \frac{EUR}{MWh}\right)$$

$$= \frac{(European\ average\ of\ P_{elec}\ for\ Sector_i\ *\ X_{ij}) *\ C_i + (European\ average\ of\ P_{gas}\ for\ Sector_i\ *\ Y_{ij})}{C_i + 1}$$

$$Energy\ cost\ difference\ for\ P_{energy}\ for\ Sector_i\ \left(in\ \frac{EUR}{MWh}\right)$$

$$= \frac{(European\ average\ of\ P_{elec}\ for\ Sector_i\ *\ C_i + European\ average\ of\ P_{gas}\ for\ Sector_i}{C_i + 1}$$

As mentioned previously, using the two formulas above, we compute the energy cost difference thanks to the following formula:

$$Weighted\ energy\ cost\ difference\ for\ Sector_i\ for\ Region_j\ (in\ \%)$$

$$= \frac{European\ cost\ difference\ for\ Sector_i\ in\ Region\ _j}{European\ average\ of\ P_{energy}\ for\ Sector_i}$$

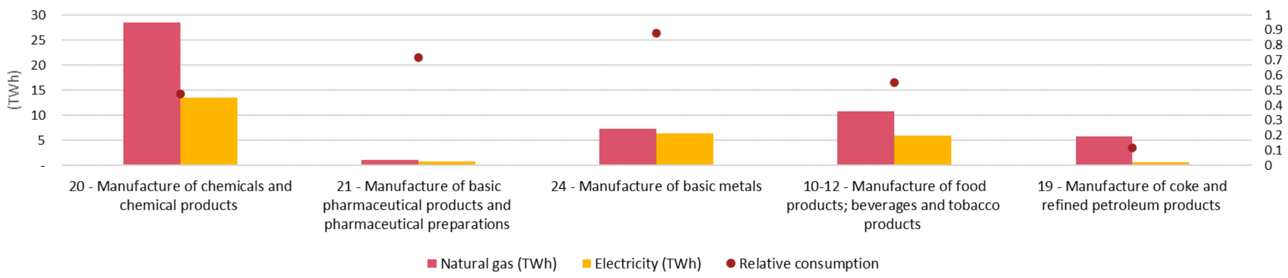
The relative consumption (C_i) used in the first equation to calculate the energy cost difference is the ratio of the total volume of electricity to the total volume of natural gas consumed in each sector. It represents which of the two types of energy is used more intensively during the production process. It is calculated based on the macro-economic data from the energy consumption accounts that we have recovered for each sector (from the Federal Planning Bureau). The following figure gives an overview of relative consumption by sector.

[464] The European average throughout this section refers to the average of the neighbouring countries under scope in this report: Germany, France, the Netherlands and the United Kingdom

[465] Where X_{ij} refers to the electricity price for Sector i in Region j and Y_{ij} refers to the natural gas price for Sector i in Region j

The volume of each energy type consumer by sector is presented on the left axis, while the relative consumption (volume of electricity divided by the volume of natural gas) is presented on the right axis. It is clear that the 5 most important sectors have a relative consumption of less than 1, which means that the 5 most important sectors consume more natural gas than electricity during the production process. For NACE 24, consumption is relatively balanced (relative consumption of 0,87), but within NACE 20 and NACE 19, natural gas consumption is almost double compared to electricity consumption.

Figure 113: Energy consumption per sector



Source: Federal Planning Bureau, PwC Calculations

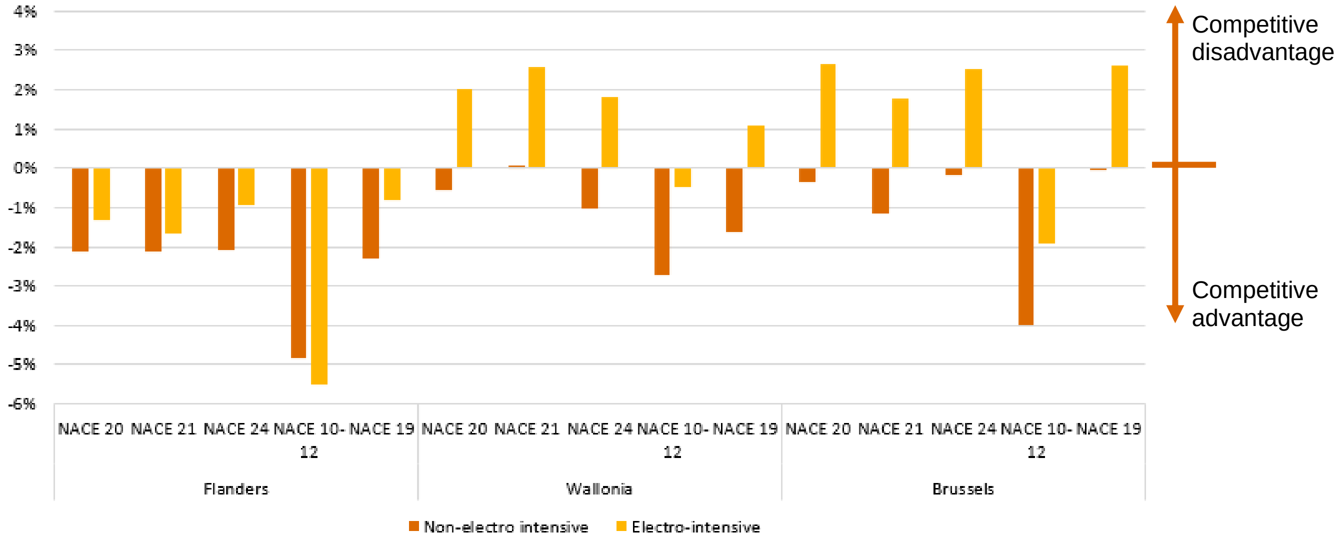
Relative consumption plays an important role in the calculation of the weighted energy cost differences since the lower the value of C_i (i.e. the more natural gas is consumed compared to electricity fed during the production process), the greater the importance of natural gas prices in the total cost of energy and in the calculation of the weighted energy cost differences is.

The results of the electricity and natural gas price differences for electro-intensive and non-electro-intensive consumers and the calculation of the weighted energy cost differences are presented in Table 134. These electricity and natural gas price differences have been calculated for the whole sector. As they are presented at a macro level, they may hide important differences between industrial consumers in the same sector.

Table 136: Results for every industrial sector in Flanders, Wallonia and Brussels compared to the average prices in Germany, France, the Netherlands and the UK (2022)

Region	Sector	Electricity price difference (electro-intensive)	Electricity price difference (non-electro-intensive)	Natural gas price difference	Relative consumption	Weighted energy cost difference (electro-intensive)	Weighted energy cost difference (non-electro-intensive)
Flanders	NACE 20	-2.63%	-0.69%	-2.05%	0.48	-1.30%	-2.14%
	NACE 21	-4.40%	-1.21%	-1.52%	0.72	-1.65%	-2.10%
	NACE 24	-1.21%	-0.15%	-2.33%	0.88	-0.93%	-2.07%
	NACE 10-12	-7.99%	-4.40%	-4.53%	0.55	-5.53%	-4.83%
	NACE 19	0.04%	-0.04%	-2.83%	0.12	-0.82%	-2.28%
Wallonia	NACE 20	5.14%	2.83%	-1.88%	0.48	2.03%	-0.57%
	NACE 21	5.28%	3.09%	-1.36%	0.72	2.56%	0.07%
	NACE 24	5.22%	2.80%	-2.15%	0.88	1.81%	-1.03%
	NACE 10-12	3.42%	0.38%	-4.29%	0.55	-0.49%	-2.71%
	NACE 19	4.47%	1.90%	-2.64%	0.12	1.08%	-1.63%
Brussels	NACE 20	4.91%	2.61%	-0.82%	0.48	2.66%	-0.36%
	NACE 21	2.80%	0.73%	-0.67%	0.72	1.78%	-1.13%
	NACE 24	6.44%	3.97%	-1.54%	0.88	2.55%	-0.19%
	NACE 10-12	-0.22%	-3.05%	-3.86%	0.55	-1.93%	-3.98%
	NACE 19	7.73%	5.05%	-2.06%	0.12	2.61%	-0.02%

Figure 114: Sectoral weighted energy costs differences (electricity) between the Belgian regions and the average of 4 European countries (Germany, France and the Netherlands, including the UK) for electro-intensive and non-electro-intensive consumption



All sectors in Flanders enjoy a competitive advantage in terms of differences in weighted energy costs when comparing electro-intensive consumers. For Wallonia and Brussels, only the NACE 10-12 sector enjoy a competitive advantage. For non-electro-intensive consumers, all sectors present a significant competitive advantage in Belgium, to higher degree than electro intensive ones for most sectors and regions except for NACE 10-12 in Flanders. Compared to 2022, the NACE 21 sector in Wallonia is the only one in Belgium this year to be categorized as “low competitive advantage”.

- Electro-intensive consumers: industrial consumers in all sectors in Flanders who compete with electro-intensive consumers in neighbouring countries have a competitive advantage from 0,5% to 5,5%. Regarding Wallonia, electro-intensive consumers face low competitive advantages in all sectors, though they benefit from a competitive advantage of around 0,5% for the NACE 10-12 consumers.

  The same situation as in Wallonia applied for Brussels, while the competitive advantage for the same segment is of almost 2%.

- Non-electro-intensive consumers: for industrial consumers in the three Belgian regions which are in competition with non-electro-intensive competitors in Germany, France, the Netherlands and the UK, the situation remains particularly competitive. In Flanders, the manufacture of food products (NACE 10-12) has the most advantageous weighted energy cost, which represent the same reality in Brussels and Wallonia. This is due mainly to the importance of the E4 profiles, less expensive profiles than E0-E3.

The differences in weighted energy costs for non-electro-intensive consumers remain negative (advantageous) for most regions and sectors in Belgium, except for the production of chemicals (NACE 20) and pharmaceuticals (NACE 21) in Wallonia. Compared with non-electro intensive consumers in neighbouring countries, weighted energy prices in Belgium are up to 5% lower than the average in neighbouring countries (decrease of 3% of the maximum competitiveness compared to 2022).

Weighted energy cost differences when excluding the UK

A comparison of energy prices in the Belgian regions in relation to the average of the four neighbouring countries studied enables us to address some of the complexity of the results presented in previous sections. Most importantly, we observed that the UK was a distinctive high-end outlier for all four electricity consumer profiles, particularly in the case of electro-intensive consumers. Therefore, it is also interesting and relevant to do the same exercise in terms of total energy price differences between the Belgian regions and neighbouring countries without taking the UK into account.

If the UK is excluded from the price comparisons, the situation at the sectoral level is different for consumers in Belgium who are competing with the so-called electro-intensive consumers in neighbouring countries: all three regions only have competitive disadvantages, while Flanders and Brussels showed at least one competitive advantage in 2022. For consumers in Belgium who compete with non-electro-intensive consumers in neighbouring countries, the situation is exactly the same though the impact is 50% less significant and does not affect the general conclusion that they are affected by a significant competitive disadvantage.

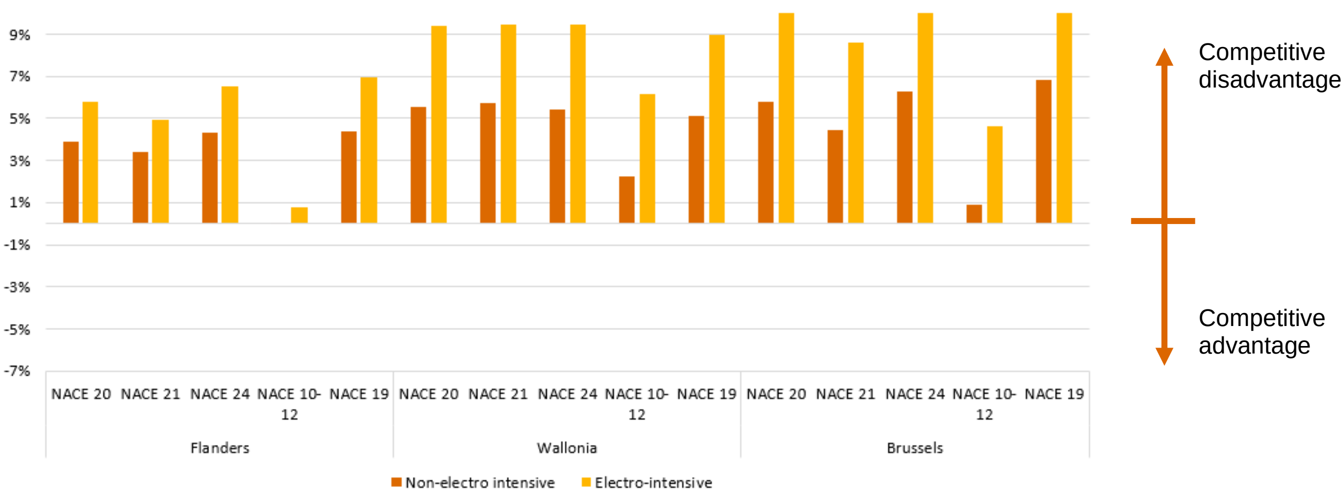
For both electro and non-electro-intensive industries, the competitiveness of all sectors in all regions is negatively affected when the UK is not considered, with a larger relative difference for electro intensive consumers.

The results of the comparison for (non-)electro-intensive consumers are shown in the below table. The differences in weighted energy costs for electro-intensive and non-electro-intensive consumers are shown in the below figure.

Table 137: Results for every industrial sector in Flanders, Wallonia and Brussels compared to the average prices in Germany, France and the Netherlands, excluding the UK (2022)

Region	Sector	Electricity price difference (electro-intensive)	Electricity price difference (non-electro-intensive)	Natural gas price difference	Relative consumption	Weighted energy cost difference (electro-intensive)	Weighted energy cost difference (non-electro-intensive)
Flanders	NACE 20	14.42%	13.95%	-6,01%	0,48	5.82%	3.89%
	NACE 21	10.98%	11.80%	-5,56%	0,72	4.96%	3.43%
	NACE 24	17.10%	15.75%	-6,25%	0,88	6.52%	4.31%
	NACE 10-12	4.84%	5.69%	-8,15%	0,55	0.80%	0.03%
	NACE 19	19.52%	17.00%	-6,68%	0,12	6.95%	4.41%
Wallonia	NACE 20	23.55%	17.99%	-5,88%	0,48	9.38%	5.56%
	NACE 21	22.22%	16.67%	-5,46%	0,72	9.46%	5.73%
	NACE 24	24.72%	19.16%	-6,10%	0,88	9.46%	5.41%
	NACE 10-12	17.85%	10.97%	-7,82%	0,55	6.17%	2.26%
	NACE 19	24.81%	19.28%	-6,49%	0,12	9.00%	5.10%
Brussels	NACE 20	23.28%	17.74%	-4,08%	0,48	10.06%	5.79%
	NACE 21	19.34%	14.00%	-4,38%	0,72	8.62%	4.46%
	NACE 24	26.17%	20.52%	-5,12%	0,88	10.26%	6.30%
	NACE 10-12	13.70%	7.18%	-7,13%	0,55	4.65%	0.93%
	NACE 19	28.71%	22.96%	-5,57%	0,12	10.65%	6.82%

Figure 115: Sectoral weighted energy costs differences (electricity) between the Belgian regions and the average of 3 European countries (Germany, France and the Netherlands, excluding the UK) for electro-intensive and non-electro-intensive consumption



Elasticity

In this section, Belgium's relative competitiveness in terms of electricity and natural gas prices is further explored through the elasticity of demand. Previously, prices charged to industrial consumers in the 3 Belgian regions (Brussels, Flanders and Wallonia) and in 4 countries (France, Germany, the Netherlands and the UK) were estimated. The concept of elasticity of demand aims at depicting the expected reaction in terms of demand, following a change in prices or consumed quantities. This exercise becomes particularly interesting in order to help design efficient energy policies. The elasticity of demand, in this study, is evaluated from a price perspective. This reaction can be transcribed into the following equation[466]:

$$\text{The elasticity of demand} = \frac{\%\ \text{change in quantity demand}}{\%\ \text{change in price demand}} = \frac{\frac{\Delta\, Quantity}{Quantity} * 100}{\frac{\Delta\, Price}{Price} * 100}$$

Conceptually, the price elasticity of demand helps to assess how demand adapts to price variations. Changes can be looked at from two time-horizon perspectives: in the short term and in the long-term. In the short-term, price elasticity of demand attempts to reflect energy consumption changes resulting from new prices. In the long-term, price elasticity of demand, which generally tends to be higher (more elastic demand) aims at reflecting rather structural changes in behaviour from the considered industrial consumers. However, when prices are high and regardless of the elasticity and the short-term or long-term changes in behaviours, a limit to adaptation and adjustments in energy demand exists from where industries would potentially consider shutting down or relocating their activity elsewhere with lower prices.

This section aims at assessing industrial consumers' price elasticity with regards to energy demand. By doing so, it is assumed to observe how industrial consumers react to price and adapt quantities.

As such, regardless of other factors that may contribute to the decision, the objective of this exercise is two-fold: it intends to evaluate the likelihood for a company to either leave or come to Belgium[467] because of energy prices differences. Concretely, this section tries to answer the following questions:

1. Is Belgium attractive to foreign industrial consumers with regards to power and natural gas prices?
2. Are other countries attractive to Belgian industrial consumers with regards to power and natural gas prices?

To that end, the elasticity of demand based on the price paid for both electricity and natural gas is used to observe the potential reaction of our industrial consumers. Based on the literature review that is later explained, it is assumed to consider the energy bills as a whole, thereby aggregating electricity and natural gas bills as both elasticity estimates (inelastic demand) are relatively similar. However, previously derived results led us to understand that significant price differences exist between non-electro-intensive and electro-intensive consumers.

When considering electricity, non-electro-intensive companies currently face relatively higher prices in Belgium than in other countries considered in this study. This means that these consumers should have, at the moment, low incentives to come to Belgium from an electricity price perspective only. With this in mind, we attempt to grasp the consumption variation they could face between abroad and Belgium, given the current price differences and up to what maximum price, they are expected to remain in Belgium. Conversely, electro-intensive consumers are here looked at as companies that could potentially relocate their activity from neighbouring countries to Belgium in case prices appear to be lower in Belgium. As several countries under study implemented financial measures to support such consumers, they often benefit from more advantageous conditions abroad than in Belgium. Concretely, we assess what consumption adjustments these consumers would benefit from if they were to leave these countries and how important would their price change should they consider operating a move in Belgium.

[466] This formula means that for every increase in energy prices of 1%, energy consumption falls by the respective proportion identified.

[467] Given that the competitivity analysis highlighted the top five sectors in Belgium, it was decided to assess the impact of elasticity at the Belgium level. However, this exercise could be more nuanced, would it be conducted considering the economic fabric of each region specifically.

Considering the two different questions we want to answer, which are to evaluate to what extent consumers are either inclined to come to Belgium or at risk of leaving Belgium, prices employed play a significant role[468]. Given the different observation angles, different prices derived from previously detailed results are used. Maximum applying prices are used to estimate the probability to come to Belgium due to sufficiently low prices. Therefore, we use maximum prices paid by non-electro-intensive and natural gas consumers for consumers potentially coming to Belgium. Inversely, we employ minimum applying prices for electro-intensive consumers and natural gas consumers for consumers at risk of leaving Belgium. Our approach thus distinguishes two types of consumers that are categorised into two consumers categories based on the prices paid:

- ***High range consumers***: maximum prices paid by non-electro-intensive consumers for electricity + maximum price paid for natural gas;
- ***Low range consumers***: minimum prices paid by electro-intensive consumers for electricity + minimum price paid for natural gas.

In this context, Belgium's top five sectors used in the competitivity analysis are considered[469].

Methodology

This exercise was conducted through a four-step approach:

(1) Through a literature review, presented below, elasticity rates are determined.

(2) Based on existing results, the difference between countries in the average total energy bills is computed per sector. To do so, we aggregate the final electricity and natural gas bills as elasticity rates employed to apply for energy considered as a whole. The total consumption volumes and the distribution of companies per profile were identified through data provided by the Federal Planning Bureau. For each sector, each country's final bill was ultimately evaluated considering the average electricity and natural gas consumer weighted by the proportion of energy used per profile and the associated price per unit of energy (EUR/MWh)[470].

(3) Then, for each sector, we compute the magnitude of energy demand variation that would exist for the two consumer groups. This variation is estimated both in absolute and relative terms based on countries' price differences and considering the elasticity of demand. While results for high range consumers (i.e. non electro-intensive) depict their energy demand variation in Belgium if a foreign consumer were to leave Belgium, results for low range consumers (i.e. electro-intensive) represent Belgian companies' energy demand variation if they were to leave Belgium. In both cases, companies would face lower energy consumption, given the current price differences.

(4) Finally, for each sector, we estimate the maximum price up to which a company is expected to remain in its current country following a variation in the quantity of consumed energy. As such, a high range of consumers' figures displays the maximum foreign price that foreign non-electro-intensive consumers are ready to accept while facing a decrease in their energy consumption. Conversely, we estimate the maximum rise in Belgian prices that Belgian consumers are willing to accept prior to considering leaving the country due to a decrease in their energy consumption. To derive the maximum price, a fixed threshold is set to determine the maximum decrease in quantity, which can be understood as the maximum acceptable company's consumption reduction due to multiple reasons such as energy efficiency, lower activity, etc. From that maximum price, it is assumed that industrial consumers start considering shutting down or relocating their activities in case they can find lower energy prices elsewhere.

Through this methodology, we expect to determine how sensitive companies are to price changes considering the sector they are active in and the existing prices in countries under study.

[468] One could assume that a company might only transfer part of its production volume or production assets to another country to benefit from more advantageous prices. However, given the macro-level of this analysis, we do not have enough information to consider partial transfers and consider the risk for a company to relocate.

[469] The identification of these five sectors was performed in chapter 3.3.

[470] Considering a specific sector - NACE 20 for instance - there are 19 E1-like consumers out of 368. Knowing that they consume about 247 GWh out of 6.616 GWh consumed by industrial consumers from the sector, it represents 3,7% of the total industrial consumption. With an estimated maximum price of 136,44 EUR/MWh in Brussels (see profile E1 in chapter 6) the electricity bill per company weighted by the profile's relative consumption in the total sector consumption is computed as follows: 136,44*(368/19)*3,7% or 977.772 EUR electricity bill. Replicating this for each industrial profile, the sector total energy (electricity and natural gas) bill is eventually computed by including the natural gas bill.

Literature review

Various academic papers have worked on energy price elasticity, providing a wide literature on the topic. While many research studies are relevant to this report, none identified could exactly meet our needs. Consequently, a selection of studies covering related topics was selected and used to derive values that could be used as proxies for this exercise. As research studies on elasticity are usually conducted at a macro-level and tend to aggregate large amounts of data from several countries, it was also decided to select papers covering industrialised or European countries in the priority given the considered countries for this study.

Most papers consider energy as a whole without narrowing it down to types of energy goods. As such, Labandeira et al. (2017)[471], a meta-analysis of 416 papers from 1990 to 2014, estimated price elasticity of demand for energy to be ranging from -0,22 to -0,224 in the short-term (ST), from -0,6 to -0,652 in the long-term (LT)[472]. However, the latter figures are not specific to industrial consumers whose energy price elasticity of demand would be of -0,166 on the short-term and of -0,508 on the long-term. Therefore, it can be understood that industrial consumers' price elasticity tends to be lower than when considering all consumers (e.g. households). Considering energy as a whole regardless of the time horizon, Trinomics (2018)[473] derive similar results with a relatively inelastic price demand for industrial consumers of -0,2 where Adeyemi & Hunt (2007)[474] estimate an elasticity of -0,22.

As this study focuses on both electricity and natural gas demand, it was decided to further detail elasticities to reflect differences in terms of industrial consumers' dependence towards both types of energy goods rather than sole energy. As no specific study could be found doing this, particularly for industrial consumers, figures were approximated from existing research studies. Labandeira et al. (2017)[475] observed short-term and long-term price elasticities for both electricity and natural gas. While the former is estimated to range from -0,209 to -0,231 (ST) or from -0,677 to -0,686 (LT), natural gas price elasticity is estimated to range from -0,216 to -0,239 (ST) or from -0,614 to -0,850 (LT). As mentioned here-above, this study reflects price elasticity on an economy-wide perspective. Consequently, we expect those figures to be lower (i.e. relatively less elastic demand in the short run) for industrial consumers, as suggested in previously introduced papers. Both short-term tendencies can be confirmed through other studies such as Horáček (2014)[476], benchmarking 36 studies, which evaluates electricity price elasticities to range from -0,16 to -0,21 and Bilgili (2013)[477], conducted on OECD countries, that deems that price elasticity of natural gas on the economy is of -0,318 to -0,345.

Additional attention was brought to identify papers that would assess the elasticity of demand for industrial consumers specifically and on those making the distinction between energy-intensive and non-energy-intensive sectors when possible. In this perspective, Chang et al. (2019) conducted this analysis of data from 20 OECD countries in 16 industries. Authors classified industries as follows:

Table 138: Classification of industry according to energy-intensity by Chang et al. (2019)

Energy Intensity	Industry
Energy-Intensive	Non-ferrous metals; Iron and steel; Chemical and petrochemical; Non-metallic minerals; and Paper, pulp, and printing
Non-energy-intensive	Fishing, Mining and quarrying, Commercial and public services, Non-specified (industry), Wood and wood products, Agriculture/forestry, Transport equipment, Textile and leather, Construction, Machinery, and Food and Tobacco

[471] (Labandeira, Labeaga, & López-Oteroa, 2017)

[472] While no specific definition is provided for short-term or long-term, it is assumed to be based on several papers to be of 1-2 years for the short-term and about 5 years for the long-term.

[473] (Trinomics, 2018)

[474] Adeyemi, O.I. and L.C. Hunt, 2007. Modelling OECD industrial energy demand: Asymmetric price responses and energy-saving technical change

[475] (Labandeira, Labeaga, & López-Oteroa, 2017)

[476] (Horáček, 2014)

[477] (Bilgili, 2013)

Their estimates resulted in price elasticity for energy demand for:

- ***Energy-intensive group***: in the ST, values range from -0,029 to -0,200 and, in the LT, values range from -0,128 to -0,529.
- ***Non-energy-intensive group***: in the ST, values range from -0,078 to -0,165 and, in the LT, values range from -0,210 to -0,594.

As we observed, results differ from one paper to another. This can be due to models used, data employed or scope of the study. Even if absolute values are different, tendencies observed are similar and serve as the basis for our choices of parameters. The following table synthesizes study scopes and estimated values:

Table 139: Summary of elasticities of price demand from the literature review

Articles	Focus	Energy good	Energy-intensity	Short-term elasticity	Long-term elasticity
Labandeira et al. (2017)	Economy	Energy	All	[-0,224; -0,22]	[-0,652; -0,6]
	Economy	Electricity	All	[-0,231; -0,209]	[-0,686; -0,677]
	Economy	Natural Gas	All	[-0,239; -0,216]	[-0,85; -0,614]
	Industrial consumers	Energy	All	-0,166	-0,508
Trinomics (2018)	Industrial consumers	Energy	All	-0,2	/
Adeyemi & Hunt (2007)	Industrial consumers	Energy	All	-0,22	/
Horáček (2014)	Economy	Electricity	All	[-0,21; -0,16]	-0,43
Bilgili (2013)	Economy	Natural Gas	All	-0,318	-0,345
Chang et al. (2019)	Industrial consumers	Energy	Energy-intensive	[-0,2; -0,029]	[-0,529; -0,128]
	Industrial consumers	Energy	Non-energy-intensive	[-0,165; -0,078]	[-0,594; -0,210]

From this literature review, it appears clear that setting a fixed value on elasticity is sensitive and largely variable. Therefore, to limit bias from the determination of parameters values, we use the average from values observed in the literature for both time-horizons. Estimated parameters are as follows:

- Average short-term price elasticity of demand: **-0,193**;
- Average long-term price elasticity of demand: **-0,525**.

As short-term price elasticity of demand appears to be relatively inelastic, companies are less likely to relocate because of energy price changes in the short run. While this statement does hold in the long-term as well, the suspected impact is already much more significant. Therefore, this exercise only makes use of the average long-term price elasticity value as the parameter. Concretely, this means that for every 1% increase in energy prices, energy consumption falls by 0,525%.

Results

Consumption changes due to price variations

First and foremost, the total energy bills for an average industrial consumer in each specific sector were computed. To do so, the distribution of companies per profile and per sector, the proportion of energy they consume in the total volume of energy consumed per sector and the associated cost per unit per profile were used. Table 140 indicates average energy bills that were identified both in absolute and proportional terms. For high range consumers, foreign prices are compared to Belgium's average bill as we evaluate Belgium's attractivity towards foreign consumers (i.e. a positive percentage indicates financial incentive to move to Belgium because of higher foreign prices). Conversely, we evaluate the risk for Belgian low range consumers to relocate due to lower foreign prices (i.e. a negative percentage indicates financial incentive to leave Belgium because of lower foreign prices compared to Belgium's). Colour codes are used to ease the reading of the table. Green highlights positive situations for Belgium – either a price-based interest to come to or remain in Belgium - whereas red depicts negative cases for Belgium – either a price-based interest to leave Belgium or to remain abroad.

Table 140: Total energy (electricity and natural gas) bills in absolute and relative terms (compared to Belgium average)[478]

Sector	Consumer range	Belgium (average)	Germany		France		The Netherlands		The UK	
		(EUR)	(EUR)	%	(EUR)	%	(EUR)	%	(EUR)	%
Nace 20	High range	291,888,559	294.881.781	1%	281.141.118	-4%	293.081.743	0%	329.794.756	13%
	Low range	288,956,352	267.803.969	-7%	253.948.473	-12%	287.619.514	0%	320.332.114	11%
Nace 24	High range	261,755,310	264.593.728	1%	251.997.826	-4%	262.838.994	0%	296.080.181	13%
	Low range	259,230,996	240.250.804	-7%	227.584.502	-12%	258.055.064	0%	287.657.332	11%
Nace 10,11 & 12	High range	17,103,610	16.972.124	-1%	17.194.949	1%	17.905.029	5%	19.771.980	16%
	Low range	16,742,697	15.489.042	-7%	15.724.602	-6%	17.541.359	5%	19.771.980	18%
Nace 21	High range	382,720,388	387.617.702	1%	379.863.539	-1%	391.769.174	2%	400.559.131	5%
	Low range	379,617,477	371.826.116	-2,1%	352.802.455	-7%	383.109.966	1%	384.265.751	1%
Nace 19	High range	234,390,521	236.988.862	1%	223.026.206	-5%	233.551.667	-0,4%	273.237.104	17%
	Low range	232,128,938	210.392.405	-9%	199.064.316	-14%	229.769.680	-1%	266.679.324	15%

Overall, Belgium seems to offer higher prices than most other countries for high range consumers for all sectors, apart from the Netherlands and the UK. For instance, Germany's prices are only 1% higher than Belgium's with regards to sector 20, sector 24, sector 21 and sector 19. The case is even more extreme in France, where only prices of sectors 10, 11 and 12 are 1% higher than those of Belgium. On the other hand, Belgium is still more attractive for all sectors in the UK, and for all sectors except sector 19 in the Netherlands. The biggest differences can be seen in the UK, where for sectors 10, 11 and 12 the UK has 18% higher prices.

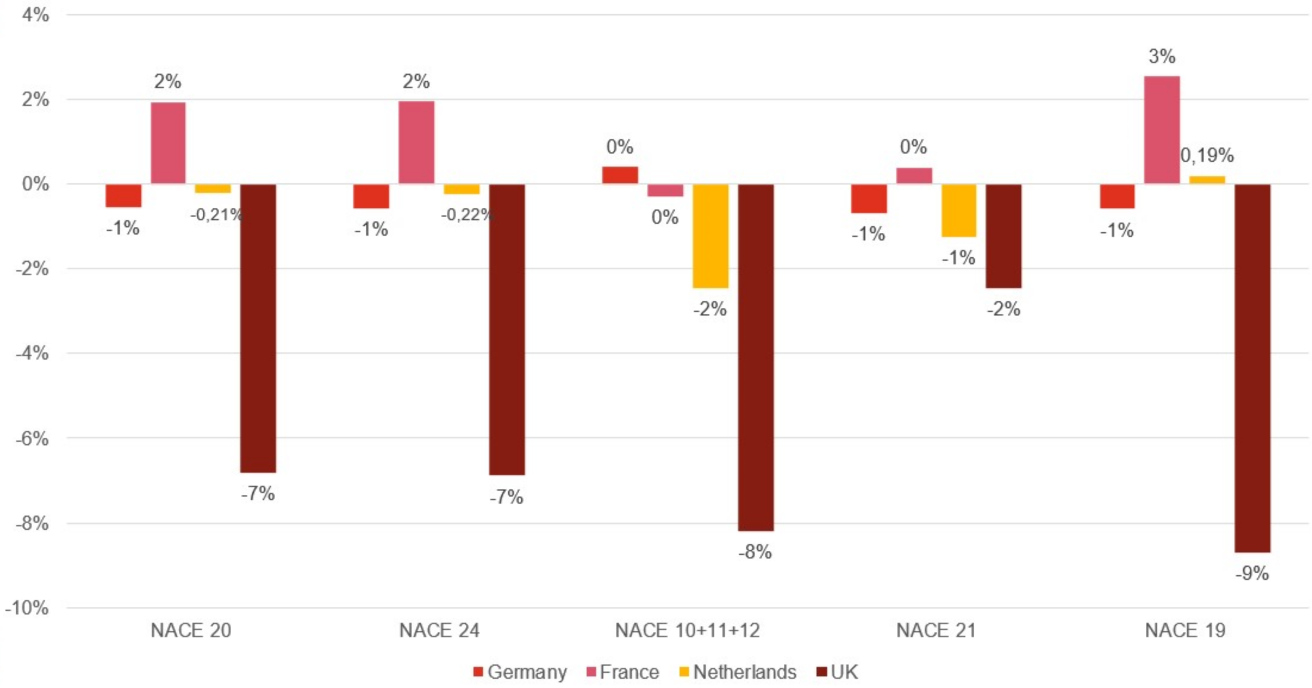
Compared to 2022, one of the most noticeable differences is that low range consumers now benefit from more competitive prices in Belgium than the Netherlands. Another big change in 2023 is that Germany has way more competitive prices; whereas last year the whole German column was highlighted green – depicting a positive situation for Belgium.

In addition, like the conclusions drawn in the previous sections, the rise in the already increased commodity costs across the regions/countries under review therefore keeps the trend of 2022 where there was a convergence among the different territories with regards to the total energy bills.

[478] As reminder, high range consumers are composed of non-electro-intensive and natural gas consumers for which we use the maximum applying prices. Low range are composed of electro-intensive and natural gas consumers for which we use the minimum applying prices.

From these price differences, we can derive consumption variation given the assumed price elasticity of demand of -0,525 (see Literature review from the elasticity section). Figure 119 attests for these variations (in %) for high range consumers (i.e., the maximum applicable price range for non-electro-intensive and natural gas consumers) whereas Figure 120 details consumption changes for low range consumers (i.e., the minimum applicable price range for electro-intensive and natural gas consumers) compared to Belgium average.

Figure 116: Change in energy (electricity and natural gas) consumption for "high range" consumers in the neighbouring countries compared to Belgium (i.e. maximum applicable prices for non-electro-intensive and natural gas consumers)



Results depicted here-above demonstrate the increased competitivity in the high range of the foreign companies' consumption. As prices are usually slightly lower in Belgium, foreign companies usually observe positive price differences compared to Belgium. Given that the elasticity term displayed preceding is negative, a negative change in consumption is expected for foreign high range consumers regardless of the sector considered. Only France stands out with a positive 2%.

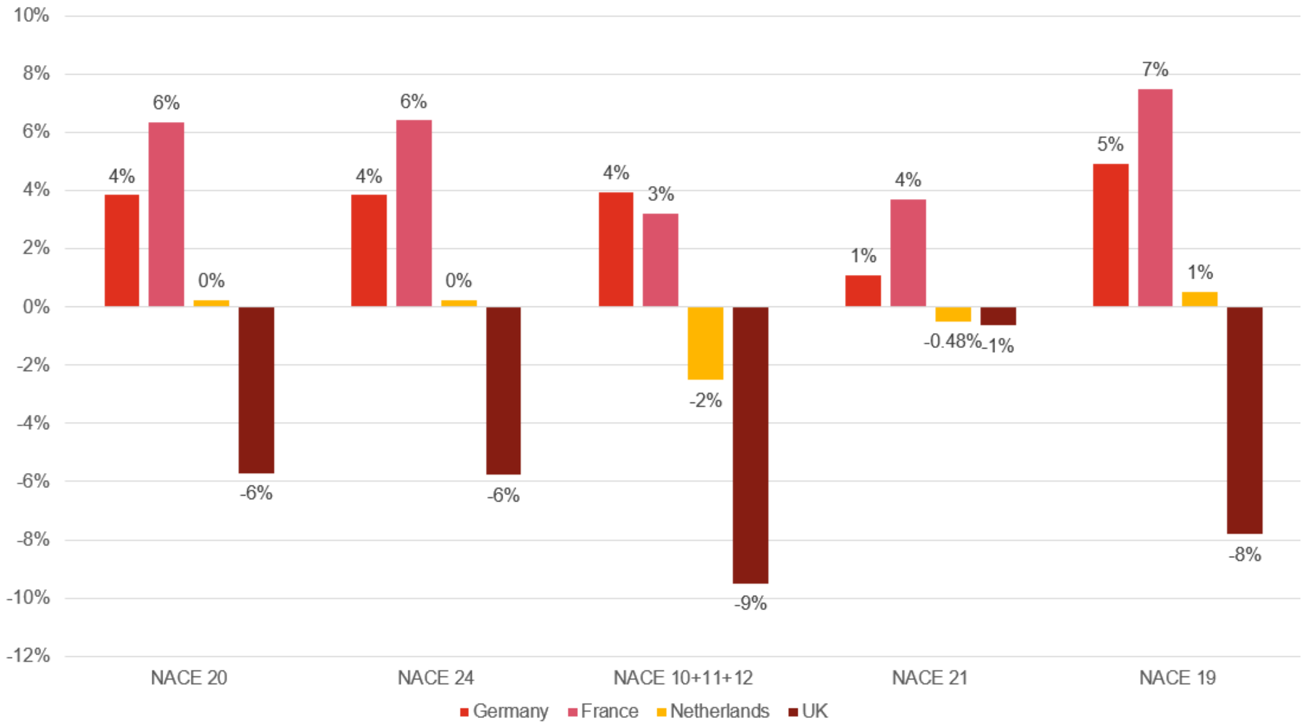
The UK appears to be the country from where consumers are currently the most affected by higher UK prices (from -2% to -9% change in demand depending on the sector) whereas France constitute the least impacted as French prices are more aligned to Belgium's (from 0% to +3% change in demand).

Figure 116 demonstrates that high range of consumers would not necessarily be better off in Belgium in most cases. Except in France, it can be asserted that lower consumption levels are reached abroad compared to what they could consume in Belgium. In terms of sectors, results are variable depending on the country but, overall, sectors 19 would be one of the most affected (except in France and to a lesser extent the Netherlands) whereas sector 21 (pharmaceuticals) would be the least impacted. This is similar to last year. Also similar to last year, we observe more convergence between the countries under review. In fact, even if UK industries are still facing the highest prices, these are less far away from the Belgian levels, mainly due to the large increase in commodity prices observed in 2022.

As opposed to high range results, low range results expose a more fragmented image. If we consider all the sectors in the UK, all Belgian consumers would experience higher consumption price levels if they were to leave Belgium. The Netherlands is very competitive with Belgium, ranging from -2% (NACE 10, 11 and 12) to 1% (NACE 19). Germany and France showcase the lower prices existing: both regions are more attractive than Belgium for all the sectors analysed.

The below graph depicts the situation with regards to the low range of consumers. Compared to 2022, we again observe also for this figure a convergence of energy bills among the regions/countries under review. For example, the UK is still less competitive than Belgium, but the variation in consumption is now between 6% to 9%, while it was between 3% to 8% last year.

Figure 117: Change in energy (electricity and natural gas) consumption for "low range" consumers in the neighbouring countries compared to Belgium (i.e., the applicable minimum price for energy-intensive and natural gas consumers)



The potential relocation of high/low range consumers

So far, we have derived potential consumption change because of price variations. This was estimated through the price differences in energy bills across countries and the application of the elasticity term based on the elasticity formula previously detailed. The opposite exercise is now conducted.

From a determined change in consumption, we estimate the maximum prices that are acceptable for one consumer prior to deciding to leave their country. In addition to short-term and long-term adjustments of consumption, it is considered that a demand reduction limit applies, above which we assume that the industry will start considering shutting down activities or relocating, provided that a location with lower prices exists. Therefore, we identify the maximum acceptable demand reduction limit, from which a bigger reduction in demand would imply more than energy efficiency measures and output adaptation changes. As Figure 119 and Figure 120 identify the resulting change in consumption from the currently estimated energy bills, we assume that it also indicates the maximum acceptable change in consumption. Taking the average from values displayed in Figure 119 and Figure 120, we obtain -3%. Therefore, we decided to set a consumption reduction threshold of 4% (i.e. a consumer is ready to accept a 4% reduction in consumption before deciding to leave the country).

Since we intend to determine structural price differences resulting from reductions granted by public authorities on taxes or transmission tariffs as observed in this study, the applicable elasticity for this exercise is the long-term price elasticity of demand.

Consequently, both Belgian and foreign companies are expected not to relocate when the maximum acceptable prices reach an increase up to 9,5% of current prices:

$$Elasticity\ of\ demand = \frac{\%\ change\ in\ quantity\ demand}{\%\ change\ in\ price\ demand}$$

$$-0{,}525 = \frac{-4\%}{\%\ change\ in\ price\ demand}$$

$$\%\ change\ in\ price\ demand = \frac{-4\%}{-0{,}525} = 7{,}6\%$$

High range foreign consumers might consider it economically rational to relocate in Belgium because of lower energy prices. Foreign prices should be higher by more than 7,6% than Belgian prices as foreign consumers are likely to remain abroad up to that maximum acceptable price. Table 140 casts light on the current price differences across countries and Table 141 synthesises countries where high range consumers are likely to be inclined to move to Belgium. The latter countries are highlighted in green, whereas red indicates that Belgium has no relocation option for the considered country based on the 7,6% maximum acceptable price.

Table 141: Relocation possibilities for high range consumers

Sector	Germany	France	Netherlands	The UK
NACE 20				
NACE 24				
NACE 10+11+12				
NACE 21				
NACE 19				

Contrary to what was observed in previous years, Belgium would now represent an attractive location for relocation for industries from all sectors only in the UK. The convergence of the energy bill observed in the regions/countries under review in 2023, due to the general increase of the commodity price, would explain that German, French and Dutch industries now face prices that are not that much higher to justify a relocation to Belgium.

Conversely, low range consumers would relocate outside Belgium once they find a country where they can benefit from a price difference higher than 7,6% (i.e. prices abroad are at least 7,6% lower than in Belgium).

Table 142: Relocation possibilities for low range consumers

Sector	Germany	France	Netherlands	The UK
NACE 20				
NACE 24				
NACE 10+11+12				
NACE 21				
NACE 19				

Differently from last year, in 2023 it appears that low range Belgian consumers do have financial incentive to leave the country. In fact, the prices observed in the neighbouring countries are only higher for the UK compared to the Belgian average to justify a relocation on a purely price-based decision. Table 140 shows, indeed, that none of the sectors in the neighbouring countries could benefit from prices 7.6% lower than the Belgian average. Like high range consumers, these conclusions can be explained by the convergence of energy bills observed at European level in 2023 due to the general increase of the commodity cost.

Key findings

It results from this analysis that we can answer to our first two questions originally set:

1. **Is Belgium attractive to foreign high range industrial consumers?**

   In 2023 Belgium appears to be less attractive for non-energy intensive industries than other countries, compared to 2022. The price differences are rather competitive, except for the UK. The price difference might be sufficient as a financial incentive to generate industry relocation towards Belgium, should this decision only be based on power and natural gas prices and ignoring all other potential decision factors. As such, high range consumers from all sectors in the UK are particularly likely to find prices lower enough in Belgium to consider relocating to Belgium as they all are getting closer to their maximum acceptable price. On the other hand, French industries cannot justify a relocation to Belgium on a purely price-based decision. For Germany and the Netherlands the situations seem the same, but less obvious than for France.

2. **Are other countries attractive for Belgian low range industrial consumers?**

   Belgium can benefit from more attractive fares for energy-intensive industries given that prices observed in neighbouring countries are higher or not lower enough to justify a relocation. This is valid for all sectors in all countries under review. Therefore, in 2023 low range industrial consumers in Belgium do not have enough financial incentive to relocate to any of its neighbouring countries.

Conclusions and recommendations

Conclusions on the competitiveness of the economy

While it is necessary to be cautious about the exact impact of the results highlighted in that chapter since they are based on a multitude of data at the macro level, some conclusions can nevertheless be drawn:

(1) The most striking conclusion is the less beneficial situation for all important industrial sectors in Belgium when they are in competition with electro-intensive consumers in neighbouring countries than when they compete with non-electro intensive consumers in neighbouring countries[479]. However, it is important to mention that the price gap between Belgium and the other countries under review has largely decreased compared to the previous years. Different conclusions can be made for non-electro-intensive consumers and electro-intensive consumers.

First, we will discuss the non-electro-intensive consumers. Industrial consumers in Belgium, that compete with non-electro-intensive consumers in neighbouring countries, including the UK, have a lower competitive advantage in terms of the total cost of energy (natural gas and electricity combined). This is the case even when excluding the UK (high outlier) from the equation, even if the competitiveness decreases for all sectors and regions. The situation in Belgium is less beneficial for non-electro-intensive consumers than in 2022.

Secondly, we observe a different competitive situation when comparing the cost of electro-intensive consumers with their counterparts in neighbouring countries that benefit from reductions and/or exemptions. When the UK is excluded, in Brussels and Wallonia electro-intensive consumers suffer from a price disadvantage compared to those in neighbouring countries. In this situation, the more competitive the neighbouring countries, the greater the risk of relocation. This risk has decreased significantly between 2021 and 2022 due to the high growth rate of commodity prices in all countries. However, with and without the UK, Flanders offers a competitive advantage in all its sectors for electro-intensive consumers, even if this advantage has decreased compared to last year.

Thirdly, Belgium's competitive position subsequently changed compared to last year, the competitive advantage for Flanders is getting even smaller, but, at the same time, the competitive disadvantage for Brussels and Wallonia is decreasing.

In countries where discounts are granted to electro-intensive consumers, the government shifts investment from non-electro-intensive to electro-intensive sectors, as required by the European Commission's Guidelines on State aid for energy and the environment. This change is the (indirect) result of an economic protection measure (authorised by the EC) aimed at electricity-intensive consumers. In the scenarios with entry criteria (German and Flemish systems), where individual electro-intensity targets at company level must be met, this change benefits only certain electro-intensive legal entities within Annexes 3 and 5 of the EEAG.

(2) Regarding **natural gas**, we observe that the overall position of Belgium compared to its neighbouring countries is still advantageous in 2023 for professional customers. In fact, this year Belgium can still offer lower prices than most other countries for the professional customers, but the overall increase in commodity cost of natural gas explains the convergence of the natural gas bills between the countries analysed.

(3) The position of **Wallonia and Brussels** in terms of total energy costs for the industry generally remains **less advantageous than in Flanders**. This situation is particularly striking for industrial sectors with a large number of small industrial electricity consumers (E0-E1), such as the food and drink sector (NACE 10-12). Wallonia now faces a competitive disadvantage for most of its sectors.

[479] Although a cap and super cap on the cost of Green Certificates was introduced in Flanders in 2018.

Recommendations

The **problem of competitiveness** on the total cost of energy that we observe in this report applies to electro-intensive industrial consumers in all sectors and in all regions. As shown in the presentation of the results, its origin lies in the cost of electricity, and in the three components of the cost of electricity: commodity price, grid charges for the E3 and E4 profiles (mainly due to the reductions granted in Germany, France and the Netherlands) and taxes, levies and certificate systems.

As recommended above, the most direct and tangible impact can be exerted on the third strand: taxes, charges and certificate systems. Currently, in all three regions, significant efforts are being made to mitigate the impact of taxes, levies and certificate systems on competitiveness. In contrast to France, Germany and the Netherlands, these efforts are generally made without considering the electro-intensity of industrial consumers. In 2023, the quantity of electricity taken off the grid remained the overriding criterion that has been used at the federal level and at regional level (quota of green certificates, public service obligations) - to protect the competitiveness of the cost of electricity for industrial consumers. Nevertheless, Flanders now considers electro-intensity since the introduction in 2018 of a cap on the amount due to the costs related to the financing of renewable energy for electro-intensive consumers. In addition, as of 1st January 2022 electricity and natural gas industrial consumers from the three Belgian regions can also be exempted from the federal special excise duty when electricity and gas are not used only for heating and transport, but also for metallurgic or chemical industrial procedures that are by definition electro-intensive. This federal special excise duty was, in 2023, reduced to its bare minimum as a measure to alleviate the bill price.

In other words, from a fiscal point of view, in addition to the cap system introduced in Flanders in 2018 and the exemption of special excise duty introduced by the federal State in 2022 and updated in 2023, the Belgian federal and regional authorities mainly grant tax reductions and/or exemptions based on the quantity of electricity taken off the grid, and not on the electro-intensity level of an industrial consumer.

Consequently, this results in significant competitive advantages for companies competing with non-electro-intensive consumers in France and Germany, while at the same time these reductions may not have a sufficient impact on the total cost of energy to protect electro-intensive industrial consumers in Wallonia and Brussels from competition from their counterparts in France, the Netherlands and Germany.

Our economic impact analysis leads us to support this assertion: **consumers that are not particularly affected by a lack of competitiveness of electricity prices are somewhat protected in Belgium given the tax schemes designed in Flanders, Brussels and Wallonia (also valid for federal taxes), while electro-intensive consumers are more at risk and they could suffer in Wallonia and Brussels from a disadvantage compared to their electro-intensive counterparts in neighbouring countries, even if this gap has increased compared to last year due to exceptional price cap measures undertaken by neighbouring countries.**

It is therefore very interesting to reflect on the possibility of adapting the current tax reductions for industrial consumers that have been introduced by the federal and regional governments. The general objective should be to generate a move towards more competitive total energy prices for industrial electro-intensive consumers, while (partly) preserving the current competitive advantage for non-electro-intensive consumers. Considering the recent events, such as the economic turmoil due to the pandemic and the war in Ukraine, this objective should be further pursued as electro-intensive consumers are likely to be more impacted by the rise in energy prices.

We would like to reiterate several points that have been previously stated and that are takeaways of the analysis:

(1) In the case of Belgium, in view of the competitive natural gas prices for the professional customers, it seems important to focus on electricity intensity and not on energy intensity as a whole.

(2) The introduction of electro-intensity criteria can be combined with a minimum offtake condition under which no reduction is allowed.

(3) The introduction of too many layers of different access criteria and levels of reduction (as is the case for the Energy excise in France) may have a negative influence on the assessment of the effectiveness of the measures. This may also reduce the predictability of tax revenues.

(4) One should be aware of possible negative side-effects. Granting access to certain reductions depending on the load profile (as is the case for reductions in network charges in Germany and the Netherlands) may have the negative effect of discouraging the development of demand response and energy efficiency.

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