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Final report

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

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Executive Summary

1. Executive Summary

1.1. Executive Summary – English

This study compares the energy prices of two residential and two small professional consumer profiles between the three Belgian regions and four other countries (Germany, France, the Netherlands and the United Kingdom) in February 2018. The comparison deals with four components for residential consumers and three components for small professional consumers.

The consumption profiles are:

- Residential consumer:
 - Electricity: 3.500 kWh/year, single meter, low-voltage network;
 - Natural gas: 23.260 kWh/year.
- Professional consumer:
 - Electricity: 50.000 kWh/year, single meter, low-voltage network;
 - Natural gas: 100.000 kWh/year.

The components are:

- Component 1: pure energy component (electricity/natural gas) excluding any other costs such as, for example in Belgium, the cogeneration & renewable energy contributions (component 3);
- Component 2: network component (transport and distribution) excluding any other costs, such as, for example in Belgium, costs related to PSOs (component 3);
- Component 3: all other costs charged to the consumer and which cannot be attributed to the first two components (taxes, levies, costs related to public service obligations (PSOs), costs related to efficient energy usage (EEU), etc.);
- Component 4: VAT (only for residential consumers)

The price comparison is preceded by an **elaborate description** of the build-up of prices and price components. General hypotheses are adopted and their application across different countries is carefully described in order to maximize the objectivity of the comparison. Energy costs are analysed from the bottom-up, and the different price components are described in a detailed way in order to offer a clear view of the origins of the observed results.

For **both electricity and natural gas**, this report notes that the components vary greatly between the different regions and countries under study, and especially the ways in which the network costs are determined and tax regimes showed to be very different in each country.

For **electricity** large differences between the regions and zones under study were found. For both residential and small professional consumers, France has the lowest annual invoice, while the annual invoice in Germany is eighty percent higher. The Netherlands and the United Kingdom have an annual invoice that is slightly higher than in France. Belgium is the second most expensive country, with large differences between the regions: the Flemish Region presents the highest annual invoice and approaches German levels, followed by the Walloon Region and the Brussels Capital Region.

As a result of the very different network costs and taxes, the proportion of each component shows strong differences between countries and regions.

The results of the comparison for **natural gas** differ. For residential consumers, the United Kingdom is the least expensive country, while the Netherlands is the most

expensive country. Belgium is the second cheapest country, even though significant differences between the regions are observed. For small professional consumers, the Flemish Region shows the lowest total invoice of all countries and regions under study. However, the average invoice from the Belgian regions is higher than the invoice in the United Kingdom, due to the higher prices in the Brussels Capital Region and to an even larger extent the Walloon Region.

The report ends with some conclusions:

- Belgian consumers are presented with a high electricity cost, which can be partly explained by network costs but mainly by taxes, surcharges, certificate schemes (component 3). On the other hand, Belgium has relatively low natural gas prices. There exist significant differences between the regions for both electricity and natural gas.
- In general, small professional consumers pay less per kWh than residential consumers, both for electricity and natural gas. This is partly explained by the VAT, which is not a real cost for small professional consumers, but small professional consumers generally also pay a lower commodity and network component.
- There are major differences between countries for both electricity and natural gas. However, the differences are relatively smaller for small professional consumers than for residential consumers.
- Finally, having a relatively low electricity cost does not imply a relatively low cost for natural gas and vice versa. The link even seems to go in the opposite direction: countries or regions with a relatively low cost for electricity generally have a relatively high cost for natural gas and vice versa (with the exception of the United Kingdom).

1.2. Executive Summary – Netherlands

Deze studie vergelijkt de energieprijzen van twee residentiële en twee kleine professionele verbruikers tussen de drie Belgische regio's en vier andere landen (Duitsland, Frankrijk, Nederland en het Verenigd Koninkrijk) in februari 2018. De vergelijking behandelt vier componenten voor de residentiële verbruikers en drie componenten voor kleine professionele verbruikers.

De consumptieprofielen zijn:

- Residentiële verbruiker:
 - Elektriciteit: 3.500 kWh/jaar, enkelvoudige meter, laagspanningsnet;
 - Aardgas: 23.260 kWh/jaar.
- Professionele verbruiker:
 - Elektriciteit: 50.000 kWh/jaar, enkelvoudige meter, laagspanningsnet;
 - Aardgas: 100.000 kWh/jaar.

De verschillende componenten die worden vergeleken zijn:

- Component 1: Zuivere energiecomponent (elektriciteit/aardgas), exclusief enige andere kosten zoals bijvoorbeeld in België de bijdragen WKK & GS (component 3);
- Component 2: Netvergoedingen (transport & distributie), exclusief enige andere kosten zoals bijvoorbeeld in België kosten in verband met openbare dienstverplichtingen (ODV's) (component 3);
- Component 3: Alle andere kosten die aan de verbruiker worden aangerekend en die niet tot de vorige 2 componenten kunnen worden gerekend (taksen, heffingen, kosten met betrekking tot ODV's, kosten met betrekking tot rationeel energie gebruik (REG),...;
- Component 4: BTW (enkel voor residentiële verbruikers)

De prijsvergelijking wordt voorafgegaan door een uitgebreide **beschrijving van de opbouw van de prijscomponenten**. Om een zo objectief mogelijke vergelijking te realiseren worden een aantal algemene hypothesen aangenomen en de toepassing ervan wordt zorgvuldig beschreven. De totale energiekost wordt bottom-up geanalyseerd en de verschillende componenten worden in detail beschreven om een duidelijk zicht te houden op de oorsprong van de eindresultaten.

Voor **zowel elektriciteit als aardgas** stelt dit rapport vast dat de opbouw sterk uiteenloopt tussen de verschillende regio's en landen onder studie, door een grote variëteit aan manieren waarop de netwerkkosten worden vastgesteld, en de belastingregimes die in elk land verschillend zijn.

De resultaten van de vergelijking voor **elektriciteit** tonen aan dat zeer grote verschillen bestaan tussen de regio's en zones onder studie. Voor zowel residentiële als kleine professionele verbruikers heeft Frankrijk de goedkoopste prijzen, terwijl prijzen in Duitsland tachtig procent hoger liggen. Nederland en het Verenigd Koninkrijk hebben prijzen die licht hoger zijn dan deze van Frankrijk. België is het op één na duurste land, met grote verschillen tussen de gewesten: het Vlaams Gewest heeft de duurste prijzen en benadert het niveau van Duitsland, gevolgd door het Waals en het Brussels Hoofdstedelijk Gewest.

Als gevolg van de sterk verschillende netwerkkosten en belastingen vertoont de opbouw van de prijzen sterke verschillen tussen de landen en regio's.

De resultaten van de vergelijking voor **aardgas** verschillen. Hier is het Verenigd Koninkrijk het goedkoopste land voor residentiële verbruikers, terwijl Nederland het duurste land is. België is het op één na goedkoopste land, met ook hier

verschillen tussen de gewesten. Wat betreft kleine professionele verbruikers is het Vlaams Gewest de goedkoopste regio van alle landen en regio's onder studie. De gemiddelde factuur van de Belgische gewesten is echter duurder dan de factuur in het Verenigd Koninkrijk, door de hogere prijzen in het Brussels Hoofdstedelijk Gewest en in nog sterkere mate het Waals Gewest.

Het rapport eindigt met enkele conclusies:

- België heeft hoge elektriciteitsprijzen, wat gedeeltelijk door netwerkkosten maar vooral door belastingen, heffingen, certificaten (component 3) kan worden verklaard. Daarentegen heeft België relatief lage aardgasprijzen. Voor zowel elektriciteit als aardgas bestaan significante verschillen tussen de gewesten.
- In het algemeen betalen kleine professionele verbruikers minder per kWh dan residentiële verbruikers, zowel voor elektriciteit als aardgas. Dit wordt gedeeltelijk verklaard door het ontbreken van de BTW, maar kleine professionele verbruikers betalen in het algemeen ook minder voor de commodity en netwerkcomponent.
- Voor zowel elektriciteit als aardgas bestaan grote verschillen tussen de landen. De verschillen zijn echter relatief kleiner voor kleine professionele verbruikers dan voor residentiële verbruikers.
- Ten slotte is het opmerkelijk dat het hebben van een relatief lage elektriciteitskost geen relatief lage kost voor aardgas of omgekeerd impliceert, en dat het verband eerder in de omgekeerde richting lijkt te gaan, en dat landen of regio's met een relatief lage kost voor elektriciteit eerder een relatief hoge kost voor aardgas hebben en omgekeerd (met uitzondering van het Verenigd Koninkrijk).

1.3. Executive Summary – Français

Cette étude compare les prix de l'énergie de deux profils de consommateurs résidentiels et deux profils de petits consommateurs professionnels entre les trois régions belges et quatre autres pays (Allemagne, France, les Pays-Bas et le Royaume-Uni). L'étude compare quatre composantes pour les consommateurs résidentiels et trois composantes pour les petits consommateurs professionnels.

Les profils de consommation sont:

- Consommateur résidentiel :
 - Electricité : 3 500 kWh/an, compteur simple, réseau de basse tension;
 - Gaz naturel : 23 260 kWh/an.
- Consommateur professionnel :
 - Electricité : 50 000 kWh/an, compteur simple, réseau de basse tension ;
 - Gaz naturel : 100 000 kWh/an.

Les différentes composantes de la facture totale sont :

- Composante 1 : Composante énergétique pure (électricité/gaz naturel), à l'exclusion de tous les autres coûts comme en Belgique la cotisation cogénération et énergie renouvelable (composante 3) ;
- Composante 2 : Tarifs de réseau (transport et distribution), à l'exclusion de tous les autres coûts comme en Belgique les coûts liés aux obligations de service public (OSP) (composante 3) ;
- Composante 3 : Tous les autres coûts facturés au consommateur et ne relevant pas des deux composantes précédentes (taxes, prélèvements, coûts liés aux OSP, coûts liés à l'utilisation rationnelle de l'énergie (URE), etc.);
- Composante 4 : TVA (uniquement pour les consommateurs résidentiels)

La comparaison des prix est précédée par une **description élaborée des composantes** détaillées du prix et de la méthodologie suivie. Des hypothèses générales ont été adoptées et leur application à travers différents pays est soigneusement décrite afin de maximiser l'objectivité de la comparaison. Le coût total de l'énergie est analysé et reconstruit complètement, tout en décrivant les différentes composantes de façon détaillée afin d'offrir une vue aussi claire que possible sur l'origine des résultats observés.

Pour ce qui concerne **l'électricité et le gaz naturel**, ce rapport note que les composantes varient considérablement entre les différentes régions et pays étudiés, et notamment que les modalités de détermination des coûts de réseau et des régimes fiscaux sont très différents selon les pays.

Pour **l'électricité**, de grandes différences entre les régions et pays étudiés ont été identifiées. Pour les consommateurs résidentiels et les petits consommateurs professionnels, la facture annuelle est la plus basse en France, tandis que la facture annuelle en Allemagne est supérieure de 80% à celle en France. Les Pays-Bas et le Royaume-Uni ont, quant à eux, une facture annuelle légèrement supérieure à celle en France. Après l'Allemagne, la Belgique est le pays le plus cher, avec de grandes différences entre les régions: la Région flamande a la facture annuelle la plus élevée (s'approchant des niveaux de prix allemands), suivie par la Région wallonne et la Région de Bruxelles-Capitale.

En conséquence des coûts de réseau et des taxes très différents, la proportion de chaque composante montre de fortes différences entre les pays et les régions.

Les résultats de la comparaison pour le **gaz naturel** diffèrent toutefois. Pour les consommateurs résidentiels, le Royaume-Uni est le pays le moins cher, tandis que les Pays-Bas sont le pays le plus cher. Après le Royaume-Uni, la Belgique est le pays le moins cher, bien qu'ici aussi, des différences significatives existent entre les régions. Pour les petits consommateurs professionnels, la Région flamande est la région la moins chère de tous les pays et régions étudiés. Cependant, la facture moyenne des régions belges est supérieure à la facture au Royaume-Uni, parce que la facture de la Région Wallonne, et celle en Région Bruxelles-Capitale, dans une moindre mesure, sont plus élevées.

Le rapport se termine par quelques conclusions:

- La Belgique a des factures élevées d'électricité, ce qui peut s'expliquer en partie par les coûts du réseau mais surtout par les taxes, surcharges et certificats (composante 3). A l'inverse, la Belgique a des factures de gaz naturel relativement basses. A une échelle plus petite, il existe également des différences significatives entre les régions pour l'électricité et le gaz naturel.
- En général, les petits consommateurs professionnels paient moins par kWh que les consommateurs résidentiels, tant pour l'électricité que pour le gaz naturel. Cela s'explique en partie par la TVA, qui n'est pas un coût réel pour les petits consommateurs professionnels, qui paient généralement moins pour les produits et les réseaux.
- Il existe des différences majeures entre les pays pour ce qui concerne l'électricité et le gaz naturel. Cependant, les différences sont relativement plus petites pour les petits consommateurs professionnels que pour les consommateurs résidentiels.
- Enfin, avoir un coût de l'électricité relativement bas n'implique pas que le coût soit également bas pour le gaz naturel et vice versa. La corrélation semble même aller dans la direction opposée: les pays ou les régions où le coût de l'électricité est relativement faible ont généralement un coût relativement élevé pour le gaz naturel et vice versa (à l'exception du Royaume-Uni).

2. Introduction

2. *Introduction*

This report is commissioned by the CREG, the Belgian federal regulator for Energy and natural Gas. In the framework of the CREG's larger mission of supervising transparency and competition on the market, ensuring market conditions serve the public interest and safeguarding consumers' essential interests, PricewaterhouseCoopers was asked to conduct a study comparing energy prices for residential and small professional consumers in Belgium and the neighbouring countries.

The purpose of this study is to compare the natural gas and electricity prices, in total as well as per component, invoiced to residential and small professional consumers in the three Belgian regions (Wallonia, Flanders, Brussels Capital Region) with those in Germany, France, the Netherlands and the United Kingdom. This report contains electricity and natural gas prices observed in February 2018. In addition to this price analysis, the purpose of this study is also to make an assessment of the impact of the observed price differences in Belgium.

This report consists of two different sections and general conclusions.

The **first section** (described in chapter 3 to 5) consists in the actual price comparison. In terms of methodology, we built up the energy cost from the bottom up, identifying four main components: the commodity price, the network cost, all other costs exclusive VAT (taxes, levies and certificate schemes) and VAT. In terms of structure, this report first describes the dataset and then the general assumptions in terms of consumer profiles and consumer behaviour, a detailed methodology on how supplier products are selected, completed by an overview of the different zones identified in all five countries under review. We then move on to a detailed description of the deconstructed energy cost for electricity and natural gas, carefully describing the observed regulatory framework, where we pay attention to certain trends regarding electricity and natural gas prices in Belgium and the neighbouring countries.

In the **second section** (described in chapter 6), we present the results per consumer profile, using a double analysis approach: how energy prices in Belgium compare to the other four countries, and how the four components of the energy price explain the observed final results.

The report ends with several general **conclusions** that can be drawn from the analysis.

3. Description of the dataset

3. Description of the dataset

3.1. General Assumptions

The general assumptions, applicable to all compared consumer profiles and countries, are outlined below.

1. *February 2018.* This study gives an overview of the price levels in February 2018.
2. *Commodity prices level.* Some countries (such as Germany), are divided into zones to compare differences in commodity prices. For those countries we have used a normal average to weigh the commodity element over the different zones.
3. *Exchange rates.* For the UK comparison, we have always used the average of all daily exchange rates over February to convert from Pound Sterling to Euro.¹
4. *VAT.* Following the terms of reference provided by the CREG, we take into account Value Added Tax for the residential profiles but not for the small professional profiles (as this tax is deductible for professional clients) in this study. All prices mentioned in the document are therefore excluding VAT.
5. *UK.* Wherever this study mentions the UK, Northern Ireland is not taken into account.
6. *Auto-production.* We assume that the profiles under study do not produce electricity themselves.
7. *Climate change agreement.* It is assumed that professional users are not part of a climate change agreement.
8. *Ownership of the meter.* It is assumed that consumers do not own their own meter.
9. *Unique contracts.* It is assumed that consumers have one contract with their supplier which covers all costs.
10. *Payment method.* In case multiple payment methods exist, the mostly used option will be taken into account.
11. *Reductions.* Reductions are not taken into consideration.
12. *Exclusion of products.* As a general rule, each product should be available for any type of consumers. For example, 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 and as a result, a replacement product will be selected.

¹ Source: *National Bank of Belgium.*

3.2. Consumer profiles

Table 1 – Description of electricity profiles

		E1	E2
When?		February 2018	February 2018
Annual demand	kWh	3.500	50.000
Connection	kV	Single meter, low-voltage network	Single meter, low-voltage network
Grid operator		DSO	DSO
Contracted capacity	kW	6	36

Table 2 – Description of natural gas profiles

		G1	G2
When?		February 2018	February 2018
Annual demand	kWh	23.260	100.000
Grid operator		DSO	DSO

3.3. Electricity: Countries/zone(s) identified

Belgium

Belgium is divided into three regions, respectively the Flemish region, the Walloon region and the Brussels Capital Region as mapped below.

Figure 1 – Regions of Belgium



It is decided to analyse the three regions separately because of the existence of (i) differing distribution charges across the three zones and (ii) a double regional impact on the third price component: taxes, levies and certificate schemes. In the Flemish region, 11 DSOs are active for electricity, operated by Eandis (Gaselwest, Imea, Imewo, Intergem, Iveka, Iverlek, Sibelgas) and Infrax (Infrax West, Inter-Energa, Iveg, PBE). For network costs - transmission and distribution tariffs - we will therefore present a weighted average value for all 11 DSOs. The calculation of those market shares is based on the number of EAN connections of each DSO and is presented in the table below.

Table 3 – Market shares of Flemish electricity DSOs

DSO	Number of EAN connections (2017) ²	Market share
Gaselwest	453.207	13,00 %
Imewo	609.654	17,49 %
Iverlek	532.325	15,27 %
Iveka	389.678	11,18 %
Inter-Energa	476.996	13,68 %
Intergem	310.918	8,92 %
Imea	320.936	9,21 %
Infrax West	141.924	4,07 %
Iveg	94.701	2,72 %
Sibelgas	63.138	1,81 %
PBE	92.872	2,66 %
Total	3.486.349	100,00%

² Latest available information on the number of EAN connections of electricity DSOs in Flanders (situation on 31st of December 2017), retrieved from the CREG.

The Walloon region has 12 DSOs³: most of them are operated by ORES (ORES Brabant Wallon, ORES Est, ORES Hainaut, ORES Luxembourg, ORES Mouscron, ORES Namur, ORES Verviers) and RESA, alongside some smaller operators: AIEG, AIESH, Gaselwest, Régie de Wavre. We will present a weighted average value for all 12 DSOs. As is the case for the Flemish DSOs, the calculation of those market shares is based on the number of EAN connections of each DSO.

Table 4 – Market shares of Walloon electricity DSOs

DSO	Number of EAN connections (2017) ⁴	Market share
Ores Hainaut	574.987	31,09%
RESA	442.589	23,93%
Ores Namur	235.850	12,75%
Ores Brabant Wallon	189.472	10,24%
Ores Luxembourg	153.945	8,32%
Ores Verviers	79.690	4,31%
Ores Mouscron	36.768	1,99%
Ores Est	58.022	3,14%
Gaselwest	14.488	0,78%
AIEG	24.929	1,35%
AIESH	21.094	1,14%
Régie de Wavre	17.818	0,96%
Total	1.849.652	100,00%

There is only one DSO active for electricity in the Brussels Capital Region, Sibelga.

The first driver of regional differences is caused by so-called *regional public service obligations* that are a consequence of the grid connection levels. The regions can impose public service obligations on grid operators below or equal to 70 kV located on their territory (which includes both profiles).

The second regional impact within Belgium is caused by the certificate schemes that stem from the regional competence in terms of renewable energy obligations on their territory. Flanders, Wallonia and the Brussels Capital Region each impose their own green certificate scheme on all electricity consumers within their region (both profiles under review).

Germany

Within the German territory, consumers can take part in one electricity market, but the standard contract (“*Grundversorgung*”) depends on the DSO region. For this reason, the commodity cost will be determined per selected DSO (see below).

As to taxes, levies and certificate schemes, most taxes are determined on the national level. The only tax that can vary is the “*Konzessionsabgabe*”, which differs on the type of contract as well as on the size of the city. Therefore, the average “*Konzessionsabgabe*” paid is considered.⁵

³ In 2017, ORES Brabant Wallon has replaced PBE as the DSO in the region. Therefore, the market share of PBE (based on 2016 figures) has been added to that of ORES BW to reflect this change.

⁴ Latest available information on the number of EAN connections of electricity DSOs in the Walloon region (situation on 31st of December 2017), retrieved from the CREG.

⁵ The *Konzessionsabgabe* is a local tax that applies to all electricity consumers connected to the distribution grid (*Konzessionsabgabenverordnung, § 1-2*).

The transmission and distribution tariffs are integrated for Germany. Yet, Germany counts about 880 distribution system operators.⁶ Therefore, it is necessary to make a relevant selection of DSOs in order to obtain representative results. After an analysis of German DSO zones, it was found that there exist an impact of the TSO zone on the network tariffs. More specifically, four different TSOs are active in Germany; their corresponding geographical coverage is depicted below.

Figure 2 – TSO regions in Germany



1. The West region which is made of Nordrhein-Westfalen, Rheinland-Pfalz Saarland, and parts of Hesse and Bayern, where Amprion is the TSO.
2. The South-West region which is made of Baden-Württemberg where Transnet BW is the TSO.
3. The Central region which is made of Niedersachsen, the other part of Hesse and Bayern, Schleswig-Holstein, Bremen and where Tennet operates the transmission grid.
4. The East region which is made of former East-Germany and Hamburg; 50 Hertz operates the transmission grid in this region.

Given the differences in underlying transmission tariffs, these zones will be analysed separately.

Regarding the choice of DSOs, differences in tariffs were found between urban DSOs and rural DSOs. Therefore, the largest urban and the largest rural DSO of each transmission zone will be selected, for which then a weighted average is calculated to integrate these DSOs in a German tariff. A similar approach is taken for the natural gas market.

⁶ Monitoringsbericht 2017, Bundesnetzagentur, 2017, p. 36.

Table 5 – Normalised market shares of German electricity DSOs

TSO	DSOs	Number of EAN connections (2018) ⁷	Normalised market share
TenneT	Bayernwerk	2.379.726	71,13%
	SWM Infrastruktur, Stammgebiet	965.955	28,87%
	Total	3.345.681	100,00%
50 Hertz	E-Dis	1.407.334	37,57%
	Stromnetz Berlin	2.339.003	62,43%
	Total	3.746.337	100,00%
Amprion	Westnetz	4.965.607	82,44%
	RNG-Netz 2 - Köln	1.057.479	17,56%
	Total	6.023.086	100,00%
Transnet BW	Netze BW	2.300.226	85,78%
	Stuttgart Netze	381.165	14,22%
	Total	2.681.391	100,00%

As stated before, the commodity cost differs between DSO-regions. The commodity cost will therefore be calculated for each DSO zone, and will be weighted according to the same weighing as the DSO tariffs.

France

In terms of electricity market, France will be treated as one single zone. The same commodity cost and network charges apply everywhere on the national territory for the two consumer profiles under review. Concerning network tariffs, Enedis, the largest DSO of France has a market share of over 95%. Therefore, only this DSO will be taken into consideration. Municipalities and departments have the option to differentiate local electricity taxes. However, almost 80% of all municipalities and almost 90% of all departments apply the maximum tax rate. Therefore, this maximum tax is considered for the entirety of the French territory.

The Netherlands

The Netherlands will also be treated as one single zone in this study. In terms of commodity costs and taxes, levies and certificates schemes, no regional differences are observed: there is one single electricity market and the taxes on electricity are only imposed on a national basis.

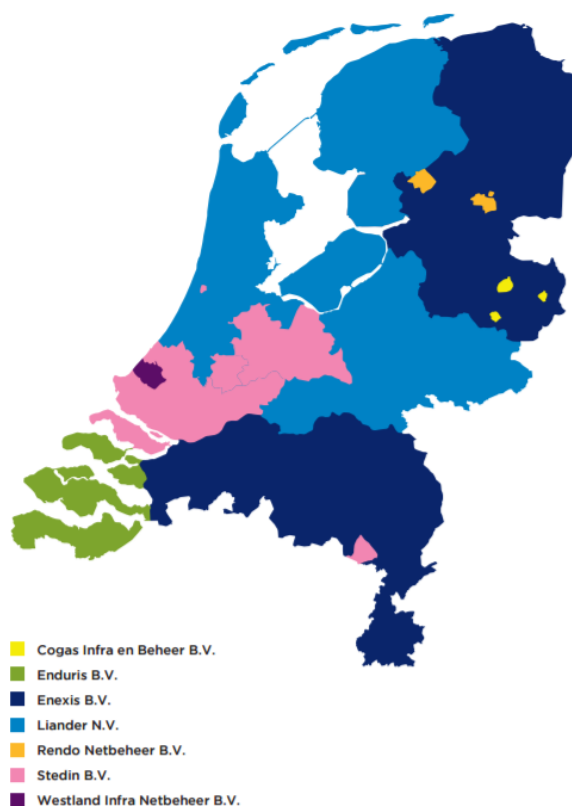
On the network cost level, the situation is somewhat more complicated. The network cost for profiles E1 and E2 consists out of the distribution tariffs imposed by the DSOs.

The Dutch distribution network counts seven different DSOs⁸ of different size and importance (see map below), who each apply different tariffs. As is the case in Germany, these distribution costs are integrated with transmission costs (two layers integrated in one cumulative tariff).

⁷ Every DSO publishes the number of EAN connections on its website. The considered data is the “entnahmestellen bzw. Anschlusspunkte Niederspannung”.

⁸ Endinet Eindhoven has been integrated in Enexis as of 1st of January 2017.

Figure 3 – DSO regions in the Netherlands



These DSOs are characterised by differences in size and number/type of clients. For profiles E1 and E2, we will therefore present a weighted average of distribution tariffs in accordance with the number of grid connections for every DSO. An overview of their number of connections (and hence their market share) can be found in the table below.

Table 6 – Market shares of Dutch electricity DSOs

DSO	Number of connections (2016) ⁹	Market share
Liander	2.950.296	36,13%
Enexis¹⁰	2.778.347	34,02%
Stedin	2.081.144	25,49%
Enduris	213.280	2,61%
Westland	57.224	0,70%
Cogas	53.155	0,65%
Rendo	32.248	0,39%
Total	8.165.694	100,00%

⁹ The number of connections are those from 2016, collected by Netbeheer Nederland and Gasunie Transport Services. For more details: <https://energiecijfers.info/hoofdstuk-1/>

¹⁰ The number of connections of Endinet Eindhoven are added to those of Enexis.

Liander, Enexis and Stedin have a combined market share of almost 95%. Therefore their tariffs have a high impact on the weighted average for distribution tariffs for profiles E1 and E2.

United Kingdom

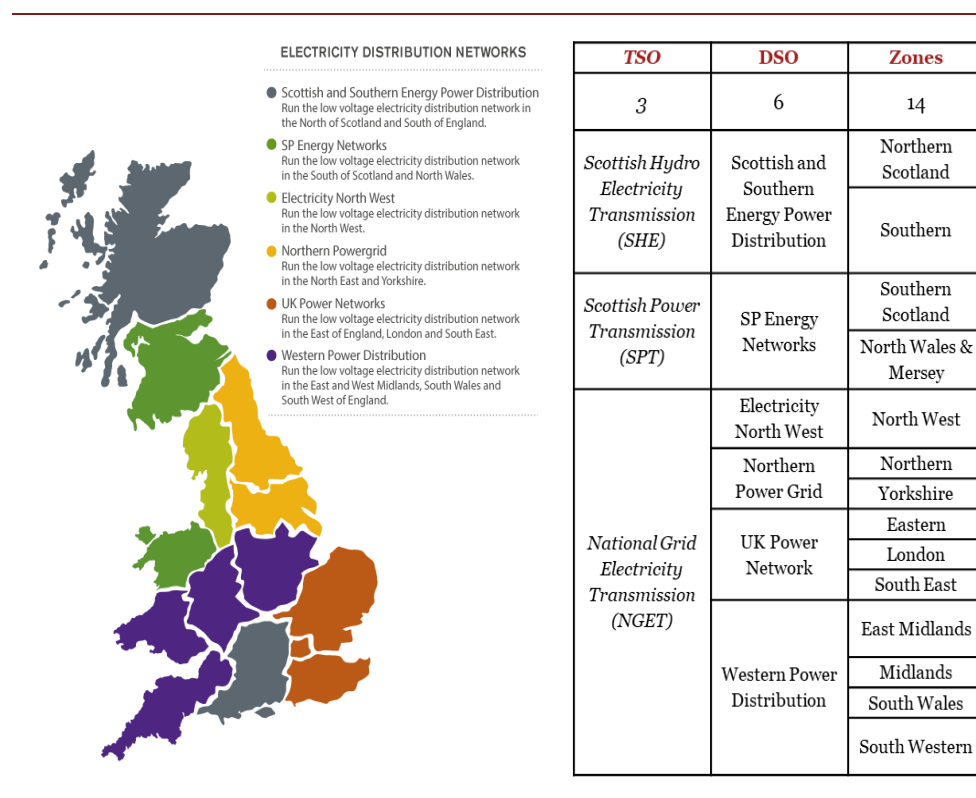
As is the case for France and the Netherlands, the United Kingdom will also be treated as one single zone in this study. In terms of commodity costs and taxes, levies and certificates schemes, no regional differences are observed: there is one single electricity market and the only taxes on electricity are imposed on a national basis.

In terms of network costs, the United Kingdom has three transmission system operators:

1. National Grid (for England and Wales);
2. Scottish Hydro Electric Transmission (SHET);
3. Scottish Power Transmission (SPT).

On top of these three transmission system operators, six distribution system operator groups are active.¹¹ The TSOs and DSOs all charge different tariffs in the same fourteen tariff zones in the UK (without Northern Ireland).

Figure 4 – DSO zones of the United Kingdom



For network costs - transmission and distribution tariffs for profiles E1 and E2 - we will once again present weighted average values for all fourteen zones.

¹¹ In addition to these large DSOs, the UK also has some smaller Independent Network Operators (IDNO's). These are not taken into account in this study.

Table 7 - Market shares of United Kingdom electricity DSOs

DSO	Number of connections points (2016)¹²	Market share
SHEPD (Northern Scotland)	762.398	2,58%
SPD (Southern Scotland)	2.002.257	6,78%
ENWL (North West)	2.381.080	8,06%
NPg (Northern)	1.596.374	5,40%
NPg (Yorkshire)	2.291.522	7,76%
SPMW (North Wales & Mersey)	1.503.914	5,09%
WPD (East Midlands)	2.622.449	8,88%
WPD (West Midlands)	2.463.217	8,34%
WPD (South Wales)	1.122.920	3,80%
WPD (South Western)	1.590.050	5,38%
SEPD (Southern)	3.016.250	10,21%
UKPN (Eastern)	3.599.594	12,18%
UKPN (South East)	2.281.009	7,72%
UKPN (London)	2.311.906	7,83%
Total	25.544.940	100,00%

¹² Figures from
<http://www.energynetworks.org/assets/files/news/publications/Energy%20Networks%20Performance.pdf>

3.4. Natural gas: Countries/zone(s) identified

Belgium

In terms of commodity cost and transmission cost, there are often no regional differences observed in Belgium¹³. The same commodity prices on the natural gas market are available to all consumers. Belgium counts only one Transmission System Operator: Fluxys Belgium.

Figure 5 – Regions of Belgium



We take as assumption that both profiles are connected to the lowest operational pressure of the distribution grid (T2). The Flemish region has 11 DSOs¹⁴ for natural gas that are operated by Eandis and Infrax, whilst in the Walloon region (7 DSOs) the distribution grid is mainly operated by ORES and RESA. We will present a weighted average of the distribution tariffs in each of the regions, based on the number of EAN connections on each of their grids. The DSO for natural gas in the Brussels Capital Region is Sibelga.

¹³ In some cases, energy suppliers do differentiate the price of their commodity element between regions, but this was not the case for the suppliers under review in the study.

¹⁴ Enexis, active in the Belgian enclave of Baarle-Hertog, is not considered in the study.

Table 8 – Market shares of Flemish natural gas DSOs

DSO	Number of EAN connections (2017) ¹⁵	Market share
Gaselwest	300.406	13,55 %
Intergem	199.711	9,01 %
Iveka	267.417	12,07 %
Iverlek	347.289	15,67 %
Imewo	405.063	18,28 %
IMEA	240.839	10,87 %
Inter-Energa	264.141	11,92 %
IVEG	86.332	3,90%
Sibelgas	46.049	2,08 %
Infrax West	59.120	2,67%
Total	2.216.367	100,00%

Table 9 – Market shares of Walloon natural gas DSOs

DSO	Number of EAN connections (2017) ¹⁶	Market share
Ores Hainaut	307.034	42,53%
RESA	238.574	33,05%
Ores Brabant Wallon	89.003	12,33%
Ores Mouscron	27.167	3,76%
Ores Namur	41.811	5,79%
Gaselwest	7.324	1,01%
Ores Luxembourg	11.047	1,53%
Total	721.960	100,00%

In terms of taxes and levies, however, some minor differences exist between regions. This is why we present the results for Belgium in the same way as we did for electricity: a separate analysis for Wallonia, Flanders and the Brussels Capital Region.

Germany

As is the case for electricity, the standard contract (“*Grundversorgung*”) of natural gas consumers depends on the DSO of its region. For this reason, the commodity cost will be determined per selected DSO (see below).

As there are over 800 different DSOs in Germany¹⁷ we will once again present a weighted average of the distribution tariffs of two large rural and two large urban DSOs from each of the four previously defined market areas, similar to what has been done for the electricity market, which will be weighed based on their respective

¹⁵ Latest available information on the number of EAN connections of natural gas DSOs in Flanders (situation on 31st of December 2017), retrieved from the CREG.

¹⁶ Latest available information on the number of EAN connections of natural gas DSOs in the Walloon region (situation on 31st of December 2017), retrieved from the CREG.

¹⁷ From Distribution networks to smart Distribution systems: rethinking the regulation of European electricity DSOs, European University Institute, THINK paper topic 12, Final report, 2013, pgs. 12-13.

normalised market shares. The DSOs that were selected¹⁸ to calculate the network cost and their market shares are presented in the table below.

Table 10 – Normalised market shares of German natural gas DSOs

DSO	Number of EAN connections ¹⁹ (2018)	Normalised market share
Bayernwerk	86.632	50,98%
SWM	83.302	49,02%
Total	169.934	100,00%
E-Dis	33.023	15,91%
NBB	174.497	84,09%
Total	207.520	100,00%
Westnetz	448.436	65,55%
RNG-Netz 2 - Köln	235.712	34,45%
Total	684.148	100,00%
Netze BW	146.223	84,07%
Karlsruhe Netz	27.697	15,93%
Total	173.920	100,00%

France

France has six different price zones for residential and small professional natural gas contracts.²⁰ As no information regarding the number of EAN connections per zone could be identified, the median zone is taken. In terms of the network costs, the distribution and transmission costs are integrated. GrDF (Gaz Réseau Distribution France) distributes 96% of all natural gas in France.²¹ No regional differences in taxes could be identified. Therefore, France is considered as one zone.

The Netherlands

Concerning the commodity costs, suppliers have the option to apply a regional surcharge, based on how far the region is situated from Groningen. In this regard, ten regions exist. However, the consulted suppliers in the selection of underlying report do not apply differentiated tariffs according to region. Therefore, the commodity component is assumed to be equal in the whole country. The Netherlands have one Transmission System Operator: Gasunie Transport Services. There are 7 DSOs in the Netherlands, whose tariffs will be weighted according to their number of EAN connections, which can be found below. Therefore, the Netherlands will be treated as one zone, with weighted averages regarding distribution tariffs.

¹⁸ These DSOs that were selected are slightly different from the DSOs that were selected for electricity. This is due to the fact that 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.

¹⁹ Every DSO publishes the number of EAN connections on its website. The number considered is the Anzahl der Ausspeisepunkte which can be retrieved from the Netzstrukturdaten section of each DSO.

²⁰ <https://particuliers.engie.fr/gaz-naturel/conseils/prix-du-gaz-naturel/zones-tarifaires.html>

²¹ <http://www.cre.fr/reseaux/infrastructures-gazieres/description-generale#section3>

Figure 6 – DSO regions in the Netherlands

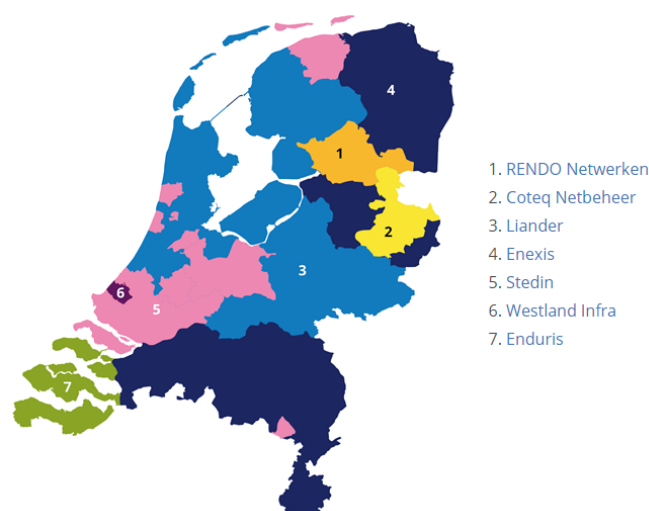


Table 11 – Market shares of Dutch natural gas DSOs

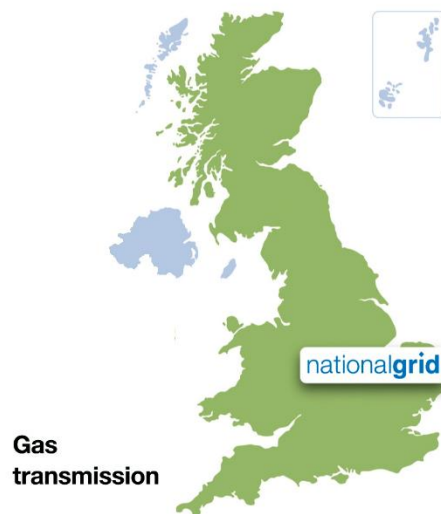
DSO	Number of EAN connections ²² (2016)	Market share
RENDONetwerken	104.062	1,45%
Coteq Netbeheer	140.165	1,95%
Liander	2.256.085	31,38%
Enexis	2.485.126	34,57%
Stedin	1.958.462	27,24%
Westland Infra	53.646	0,75%
Enduris	190.626	2,65%
Total	7.189.272	100,00%

United Kingdom

The United Kingdom will be presented as one single zone for natural gas in this study (leaving out Northern Ireland). There are no regional taxes, and there is one single natural gas transmission system operator, *National Grid Gas plc*.

²² The number of connections are those from 2016, collected by Netbeheer Nederland and Gasunie Transport Services. For more details: <https://energiecijfers.info/hoofdstuk-1/>

Figure 7 – TSO region in the United Kingdom



On top of the transmission system operator, there are eight natural gas distribution networks²³. These eight networks are owned and managed by the following four DSOs:

1. Cadent Gas Ltd:
 - West Midlands;
 - North West;
 - East of England and North London;
2. Northern Gas Networks Ltd.:
 - North East England (including Yorkshire and Northern Cumbria);
3. Wales & West Utilities Ltd.:
 - Wales;
 - South West England;
4. Southern Gas Networks
 - Scotland;
 - Southern England (including South London).

²³ <https://www.ofgem.gov.uk/gas/distribution-networks/gb-gas-distribution-network>

In addition, there are a number of smaller networks owned and operated by Independent natural Gas Transporters. These will not be taken into account.²⁴ As no information is available on the level of the eight natural gas distribution operators, we will use the market shares of the natural gas distribution companies to weigh the network tariffs, which are presented in the table below²⁵.

Table 12 – Market shares of United Kingdom natural gas DSOs

DSO	Number of EAN connections ²⁶	Market share
Cadent Gas²⁷	10.900.000	49,55%
Northern Gas Networks	2.700.000	12,27%
Wales and West Utilities	2.500.000	11,36%
Scotland and Southern England	5.900.000	26,82%
Total	22.000.000	100,00%

3.5. Commodity component

This section describes the general methodology that has been used to collect the data that was used to construct the European comparison of electricity and natural gas prices for residential and small professional consumers.

Defining the number of products

The number of products will be selected based on the market concentration of the retail market (HHI-index) for each of the countries under review. This methodology allows to select a variety of products, which can differ country by country and could be even different for electricity and natural gas. The more concentrated a market (large combined market share of few suppliers), the less products will be taken into account. The less concentrated a market (several suppliers with rather low market shares), the more products will be taken into account to reflect the market dynamics.

The number of products based on the HHI-index that will be selected are presented in the table below:

Table 13 – Defining the number of products

HHI-Index	Description	Number of products
HHI ≤ 1.000	Little concentrated market	5
1.000 < HHI ≤ 2.000	Concentrated market	4
HHI > 2.000	Very concentrated market	3

The HHI-index for each country and each utility was retrieved from the 2017 Retail Markets Monitoring Report from the Council of European Energy Regulators and needs to be updated with each release of the report.²⁸

²⁴ On top of the transmission system operator, there are eight gas distribution networks.

²⁵ Only a rough estimate of the number of EAN connections is available.

²⁶ The number of EAN connections for each of the four gas distribution companies were retrieved (rounded figures) from their websites.

²⁷ In 2017, National Grid Distribution began business under a new brand, Cadent.

²⁸ With the exception of Germany, as German authorities do not report HHI indices anymore. Therefore an older HHI index is used for Germany. However, as German authorities plan to calculate HHI indices in the future, future updates will contain the German HHI published in the CEER report from the moment it is published.

Selection of products portfolio

Based on the HHI-index for each country, and each utility, a number of products to be selected has been defined. In order to define which products will be taken into account for the price comparison, the following rule of thumb needs to be followed:

- The first product to be taken into account is the standard product of the market incumbent;
- The second product to be taken into account is the cheapest product on the market, not taken into account any lump-sum reductions. The cheapest product will be retrieved through a price comparison tool in each country²⁹;
- The third product to be taken into account is the cheapest product of the market incumbent through the price comparison tool of each respective country. In certain cases, it is possible that these comparison websites are not up to date and are presenting prices of contracts from a previous month³⁰.
- The fourth/fifth product to be taken into account are one/two of the cheapest products of the second largest supplier that has not been taken into account yet.

It might happen that a product of the market incumbent might be the cheapest product of the market. In that case, this product will be weighted equally with the other product of the market incumbent, and the cheapest product will be omitted. As the total number of products doesn't change, the next product (e.g. instead of the third the fourth product) will be selected.

In case a supplier has only one product. In this case also the next product will be selected.

Weight of each product within the product portfolio

The selected products will be weighed as followed:

- The switching rate (in %) for each utility in each country will be the weight that will be attached to the cheapest product (second product to be taken into account)
- The remaining share (100% - switching rate) will then be used to weigh the other products as follows:
 - If the remaining products are two products of the market incumbent, the weight of both products will simply be the remaining share (100% - switching rate), divided by two³¹.

²⁹ A limitation of this method exist 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.

³⁰ It is possible that in the beginning of the month (or even later), price comparison tools do not publish the most recent information available at that moment in time. In those cases, prices of contracts from previous months could be taken into account.

³¹ Example: if the switching rate amounts to 20%, the remaining 80% will be used to weigh the two remaining products of the market incumbent, which each account for 40%.

-
- If there are products of other market players taken into account, the normalised market shares of the selected market players will be extrapolated to the remaining share (100% - switching rate)³².
 - In case more than one product of a certain supplier is selected, each of them will receive the same weight (and hence has the previously determined weight of the supplier, divided by two).^{33 34}
 - Switching rates were retrieved on the Retail Markets Monitoring Report by the Council of European Energy Regulators and make the distinction between residential and small professional consumers.³⁵

³² Example: if the switching rate amounts to 20%, the remaining 80% will be 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 will be '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 $33,33*80\% = 26,67\%$.)

³³ 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 will have a weight of $53,33\%/2 = 26,66\%$.

³⁴ 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.

³⁵ Yet, the Netherlands and Belgium don't publish separate data for residential and non-residential consumers. For these countries, the combined annual switching rate was therefore used as published by the Energy fact sheets from the European Commission.

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

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

4.1. Belgium

Electricity suppliers in Belgium are known to have quite transparent tariff sheets. Most suppliers publish their current and previous tariff sheets online and give a detailed view on how the final tariff is built up. In general, most products detail all elements of the following charges: energy prices, distribution and transport charges, taxes, levies and surcharges and VAT.

Component 1 – Commodity price

The HHI of the retail market in Belgium was over 2.000 in 2017.³⁶ Therefore, only three products will be considered: the standard product, the cheapest product of the market incumbent, and the cheapest offer on the market³⁷. The switching rate for Belgium is 12,2%.³⁸ The products of the market incumbent have thus a weight of $(100 \% - 12,20 \%) / 2$ or 43,90 % each. The weight of the products for profiles E1 and E2 are presented in the table below.³⁹

Table 14 – Weights attached to the selected products for E1 and E2 in Belgium

Product	Weight E1	Weight E2
Standard product of market incumbent	43,90 %	43,90 %
Cheapest product on the market	12,20 %	12,20 %
Cheapest product of the market incumbent	43,90 %	43,90 %
Total	100,00 %	100,00 %

³⁶ However the interval is known, the exact HHI index is not reported by the CEER. Please see <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f> for more information.

³⁷ When the standard product of the incumbent was also its cheapest product, we took the cheapest product of the second largest supplier³⁷ for each of the regions into account.

³⁸ Please see https://ec.europa.eu/commission/sites/beta-political/files/energy-union-factsheet-belgium_en.pdf, p7 for more information on the switching rate.

³⁹ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

An overview of the products we have selected per region and their annual cost is presented in the table below. The cheapest products have been selected through the price comparison websites of the respective regional regulators:

<https://vtest.vreg.be> for Flanders, www.compacwape.be for Wallonia and www.brusim.be for Brussels. All prices reported are VAT excluded.

Table 15 – Selected products for profile E1 in Belgium

Region	Supplier - Product	Fixed component (€/year)	Price per kWh (c€/kWh)
Flanders	Engie - Easy Indexed	50,00	6,70
	Energy People - Elektriciteit	12,40	4,65
	Groen 2	22,60	5,75
	ENGIE - Direct		
Wallonia	ENGIE - Easy Indexed	50,00	6,70
	Klinkenberg - Eco	8,26	4,67
	ENGIE - Direct	22,60	5,75
Brussels	ENGIE - Easy Indexed	50,00	6,70
	Mega - Super	8,26	5,01
	ENGIE - Direct	22,60	5,75

Table 16 – Selected products for profile E2 in Belgium

Region	Supplier - Product	Fixed component (€/year)	Price per kWh (c€/kWh)
Flanders	ENGIE – Easy Pro Indexed	48,50	7,09
	EBEM – V@St	33,06	4,70
	ENGIE - Direct Pro	14,81	6,04
Wallonia	ENGIE – Easy Pro Indexed	48,50	7,09
	Luminus – Optifix Pro	35,00	4,75
	ENGIE - Direct Pro	14,81	6,04
Brussels	ENGIE – Easy Pro Indexed	48,50	7,09
	Luminus – Optifix Pro	35,00	4,57
	ENGIE - Direct Pro	14,81	6,04

Component 2 – Network costs

Transmission costs

The same transmission tariff structure applies to all profiles under review in this study and varies between regions from DSO to DSO. In our study, we have selected the transmission tariffs for the low-voltage networks (i.e. “*LS zonder piekmeting*” or “*BT sans mesurage de pointe*”). Transmission costs for residential and small professional consumers in Belgium have four components:

1. *Tariffs for the management and the development of the grid infrastructure:* this cost consists out of a tariff for the electricity being consumed;
2. *Tariffs for the management of the electric system;*
3. *Tariffs for the power reserves and black-start;*
4. *Tariffs for market integration:* this cost relates to services provided by Elia 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.

Distribution costs

Distribution tariffs have to be added on top of the transmission tariffs. In our study, we select the tariffs for the low-voltage networks on the distribution grid (i.e. “*LS zonder piekmeting*” or “*BT sans mesure de pointe*”). For each Belgian region, distribution tariffs typically have four components⁴⁰:

1. *Tariffs for network put at disposal;*
2. *Tariffs for system management;*
3. *Tariffs for measuring and invoicing* (for which we have taken the annual cost of a meter with yearly measuring into account);
4. *Tariffs for network losses.*

For each region of Belgium, we compute the tariff through a weighted average of each component across all DSOs active in the region (weights are given in terms of EAN connection points per DSO in 2017). As stated above, for the Flemish region, all DSOs operated by INFRAX or EANDIS were taken into account (representing 100% of distributed EAN connections points in the region in 2017). For the Walloon region, all DSOs operated by ORES and RESA as well as Gaselwest, Régie de Wavre, AIEG and AIESH were taken into account (representing 100% of EAN connection points in the region in 2017).

It should be noted that regional regulators have different timings in terms of adoption of transmission tariffs.

Table 17 – Overview of adoption of new tariffs by regional regulators

Adoption of new tariffs by regional regulators	Transmission
VREG	1/3/2018
BRUGEL	1/1/2018
CWAPE	1/3/2018

Hence, as the period analysed in the scope of this study is the month of February 2018, some transmission tariffs (Flanders, Wallonia) were taken into account at their 2017 level, as this is the tariff applicable in February 2018. This is the case for the adoption of transmission tariffs by the VREG and the CWaPE.⁴¹ Another element to be highlighted is the fact that for both profiles, federal public service obligations

⁴⁰ Tariffs for Flanders can be found on the website of the VREG, see <http://www.vreg.be/nl/distributienettarieven-elektriciteit-en-aardgas-2018> ; for Wallonia on the website of the CWaPE, see <https://www.cwape.be/?lg=1&dir=7.3.6> and for Brussels on the website of Sibelga, see <https://www.sibelga.be/nl/tarieven/tarieven-netgebruik/distributiekosten/elektriciteit>

⁴¹ Since a change in legislation in March 2018, DSO's can no longer apply different rates for the federal contribution than the ones issued by the CREG. Therefore, the same federal contribution has been used for all three regions.

as well as federal taxes and levies vary across the three regions due to DSO network losses, which vary between different individual DSOs.

Component 3 – Taxes and levies (excluding VAT)

In Belgium, several additional costs apply to electricity, which can be summarized in four categories, as detailed below:

1. **Federal Public Service Obligations (Federal PSOs)** on the transport grid, applicable to all regions⁴²:
 - a. Financing of the connection of offshore wind turbine parks;
 - b. Financing of green certificates;
 - c. Financing of strategic reserves;
2. **Regional Public Service Obligations (Regional PSOs)**
 - a. Regional PSOs on the local transport grid (30-36-70 kV)
 - i. Financing of support measures for energy and cogeneration in Flanders (0,14849 c€/kWh);
 - ii. Financing measures for the promotion of rational energy use in Flanders (0,0308 c€/kWh);
 - iii. Financing of support measures for renewable energy in Wallonia (1,373 c€/kWh);
 - iv. Financing of regional energy policies in Brussels (0,81 €/month for profile E1 and 3,25 €/month for profile E2);
 - b. Regional PSOs for consumers connected to the distribution grid⁴³ which comprise:
 - i. A general tariff for regional PSOs (Flanders);
 - ii. Financing of expenses and unfunded pensions;
 - iii. Financing of tax on legal entities (in Flanders) and income tax (in Wallonia and Brussels);
 - iv. Financing for use of pylons and trenches (in Flanders) occupying the public domain (in Wallonia) and use of the network (in Brussels);
 - v. Other local, provincial, state and federal taxes, levies, charges, contributions and payments.

⁴² Financing of support measures for renewable energy, green certificate, strategic reserves and others are combined in one single tariff by Sibelga in Brussels and is called the 'Elia surcharge for Brussels'.

⁴³ 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 volume of distributed electricity per DSO).

Table 18 – Overview of distribution taxes and levies for electricity

Region	Flanders	Wallonia	Brussels
Public Service Obligations	✓	✓	✓
Expenses for unfunded pensions	✓	✓	✓
Financing of tax on legal entities	✓		
Financing of income tax		✓	✓
Financing for use of pylons and trenches	✓		
Financing for occupying public domain		✓	
Financing for use of public domain			✓
Other local, provincial or regional taxes (for example for the occupation of the road network)	✓	✓	✓

3. **Taxes and levies** on the federal and on the regional level:

- Federal contribution (0,34474 c€/kWh), increased by 1,1% to pay for supplier administrative costs;
- Energy contribution (0,19261 c€/kWh);
- “Contribution for the energy fund” in Flanders⁴⁴ (0,42 €/month for profile E1 and 7,87 €/month for profile E2);
- Connection fee in Wallonia (0,075 c€/kWh)⁴⁵;

4. **Certificate schemes and other indirect costs.** The three regions have a green certificate system for renewable energies, Flanders also has a certificate system for combined heat/power. Each region has its own quatum for green certificates and can fine suppliers for not reaching the quatum. Therefore, the cost that is charged from the supplier upon the consumer varies as well. We take into account the additional “Green Certificate costs” surcharge published by each of the selected suppliers on their tariff sheets in each of the regions.

Component 4 – VAT

VAT on electricity for residential consumers in Belgium amounts to 21% and will be presented as a different price component. On the federal contribution, contribution for the energy fund in Flanders and the connection fee in Wallonia, no VAT is due.

⁴⁴ <https://www.vlaanderen.be/nl/bouwen-wonen-en-energie/elektriciteit-aardgas-en-verwarming/energieheffing-bijdrage-energiefonds>

⁴⁵ <https://energie.wallonie.be/servlet/Repository/agw-du-19-06-2003.pdf?ID=42299>

4.2. Germany

Component 1 – Commodity price

The HHI of the retail market in Germany was 2.021 in 2014.⁴⁶ Therefore, three products will be considered. For E1 and E2, these are the standard product, the cheapest product of the market incumbent, and the cheapest offer on the market. The weights are as presented in the table below. The annual switching rate was 9,6% for household consumers and 12,7% for non-household consumers in 2016.⁴⁷ The products of the market incumbent have thus a weight of $(100 \% - 9,60 \%) / 2$ or 45,20 % each for household consumers and a weight of $(100 \% - 12,70 \%) / 2$ or 43,65 % each for non-household consumers. The weight of the products for profiles E1 and E2 are presented in the table below.⁴⁸

Table 19 – Weights attached to the selected products for profiles E1 and E2 in Germany

Product	Weight E1	Weight E2
Standard product of the market incumbent	45,20%	43,65%
Cheapest product on the market	9,60%	12,70%
Cheapest product of the market incumbent	45,20%	43,65%
Total	100,00%	100,00%

German suppliers offer consumers an ‘all-in tariff’. In order to retrieve the commodity element of the price for Germany, we therefore needed to deduct the network charges, taxes and VAT from these ‘all-in tariffs’.

The cheapest product was obtained through the website www.stromvergleich.de. The standard product (“Grundversorgung” product) is offered by a standard supplier, which varies in every DSO region. Therefore, for every DSO, the standard product was determined, as well as the most competitive product of the standard product. The products selected for profile E1 and profile E2 and their prices are stated in the two tables below and are shown including taxes and network charges, but excluding VAT.

⁴⁶

https://ec.europa.eu/energy/sites/ener/files/documents/2014_energy_market_en_o.pdf
p.50

⁴⁷ <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f>
p. 37 for household switching rates and p.41 for non-household switching rates.

⁴⁸ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

Table 20 – Selected products for profile E1 in Germany

DSO	Supplier – Product	Grundpreis (€/year)	Arbeitspreis (c€/kWh)
Bayernwerk Netz	E.ON – Grundversorgung Strom	100,00	25,86
	Immergrün! Energie – SparKlassikPremium12	76,84	22,89
	E.ON – KlassikStrom	100,00	23,19
SWM Infrastruktur, Stammgebiet	SWM – Grund- und Ersatzversorgung	93,08	22,71
	Immergrün! Energie – SparKlassikPremium12	91,06	22,10
	SWM – M-Strom Garant	89,18	22,13
E.DIS Netz, gesamtes Netzgebiet	E.ON – Grundversorgung Strom	100,00	25,86
	Immergrün! Energie – SparKlassikPremium12	92,97	25,76
	E.ON – KlassikStrom	100,00	27,90
Stromnetz Berlin GmbH, gesamtes Stromnetz	Vattenfall – Tarif Berlin Basis Privatstrom	82,69	25,03
	Vattenfall – Easy24 Strom für Berlin	88,74	22,08
	Immergrün! Energie – SparKlassikPremium12	67,66	22,31
Westnetz GmbH-GV innogy SE	Innogy – Strom Klassik	84,00	23,99
	Innogy – Strom Stabil	104,00	23,99
	Immergrün! Energie – SparKlassikPremium12	85,82	22,33
RNG-Netz 2 - Köln	RheinEnergie – FairRegio Strom Basis	120,80	21,20

	Immergrün! Energie – SparKlassikPremium12	108,50	20,53
	RheinEnergie – Stromtarif FairRegio Strom plus Konstant 2018 XL-Option	113,60	20,75
Netze BW GmbH	EnBW – Komfort Haushalt	79,46	24,13
	Immergrün! Energie – SparKlassikPremium12	57,18	21,95
	EnBW – Online	116,37	22,42
Stuttgart Netze, gesamtes Netzgebiet	EnBW – Komfort Haushalt	79,46	24,13
	Immergrün! Energie – SparKlassikPremium12	40,84	24,46
	EnBW – Online	78,15	21,93

Table 21 – Selected products for profile E2 in Germany

DSO	Supplier – Product	Grundpreis (€/year)	Arbeitspreis (c€/kWh)
Bayernwerk Netz	E.ON – UnternehmerStrom Fix 12 Öko	107,71	21,69
	123Energie – 123Strom Profi	207,68	20,83
	E.ON – UnternehmerStrom Online	87,71	21,29
SWM Infrastruktur, Stammgebiet	SWM – M-Strom business Garant	89,18	22,13
	123Energie – 123Strom Profi	207,68	20,83
	SWM – M-Strom Business Direkt	76,18	21,58
E.DIS Netz, gesamtes Netzgebiet	E.ON – UnternehmerStrom Fix 12 Öko	100,00	24,50

	123Energie – 123Strom Profi	228,69	21,94
	E.ON – UnternehmerStrom Online	95,00	24,00
Stromnetz Berlin GmbH, gesamtes Stromnetz	Profi strom	105,00	21,30
	123Energie – 123Strom Profi	196,24	20,19
	Berlin – Gewerbe Strom	82,20	25,33
Westnetz GmbH-GV innogy SE	Innogy – Strom Klassik	82,11	23,99
	123Energie – 123Strom Profi	221,53	20,55
	Innogy – Strom Stabil	104,00	23,99
RNG-Netz 2 - Köln	RheinEnergie – Gewerbestrom plus	156,00	22,11
	123Energie – 123Strom Profi	258,69	18,69
	RheinEnergie – TradeRegio Strom plus	174,00	22,63
Netze BW GmbH	Relax Profi	289,11	22,03
	123Energie – 123Strom Profi	201,60	20,31
	Direktstrom Gewerbe	176,07	23,00
Stuttgart Netze, gesamtes Netzgebiet	Relax Profi	268,03	21,42
	123Energie – 123Strom Profi	163,84	21,08
	Direktstrom Gewerbe	138,05	22,73

Component 2 – Network costs

The German electricity grid organisation is fairly different from the Belgian one. The four transmission grid operators only operate on the (extra-) high voltage grid, while everything else (often, but not always, up to 110 kV) is operated by the distribution system operators.

Transmission and distribution tariffs in Germany are integrated and presented as one single tariff to the consumers on the distribution grid. As stated in the description of the dataset, we present results for the four transmission zones in Germany. As Germany counts about 880 distribution system operators⁴⁹, the network cost we present for profiles E1 and E2 is a weighted average of two large DSOs in each transmission zone (one rural, one urban DSO).

German distribution grid fees follow a similar methodology as those of the transmission grid but have a different terminology. Although every DSO imposes different rates for different ranges of both maximum capacity contracted and electricity consumer, their tariffs involve the same three components:

1. *Capacity charge* (i.e. “*Leistungspreis*”): depends upon the maximum capacity in kW contracted, expressed in € per year;
2. *Consumption charge* (i.e. “*Arbeitspreis*”): depends upon the volume of energy consumed in kWh per year, expressed in c€/kWh per year;
3. *Metering costs*: charges related to the cost of metering and invoicing, fixed prices expressed in € per year.

Component 3 – Taxes and levies (excluding VAT)

In Germany, seven taxes/surcharges apply on electricity:

1. The §9 *Umlage KWK-G Aufschlag* is a surcharge that pays for CHP-plant subsidies. The calculation is based on present forecast data of DSOs and the Federal office for Economic Affairs and Export Control (BAFA). The rate for the profiles E1 and E2 is 0,345 c€/kWh.⁵⁰
2. The “*StromNEV*” §19-*Umlage*, which is a digressive levy to compensate for the §19 transmission tariff reductions. The rate for profiles E1 and E2 is 0,370 c€/kWh.⁵¹
3. The §7 *Umlage*, which is a digressive levy, except for the first band which is negative, to pay for offshore wind power generation units. Different rates apply to different bands of total electricity consumption. There exist reductions for this levy for the consumption above 1 GWh. As this is higher than the consumption of the profiles under study, the standard rate of 0,037 c€/kWh applies for both profiles.⁵²
4. The “*EEG-Umlage*” contributes to the financing of all renewable energies other than offshore wind power generation units. Reductions are not applicable for the profiles under study, and hence the standard rate of 6,792 c€/kWh applies for both profiles.⁵³

⁴⁹ Monitoringsbericht 2017, Bundesnetzagentur, 2017, p. 36.

⁵⁰ <https://www.netztransparenz.de/KWKG/KWKG-Umlagen-Uebersicht>

⁵¹ <https://www.netztransparenz.de/EnWG/-19-StromNEV-Umlage/-19-StromNEV-Umlagen-Uebersicht>

⁵² <https://www.netztransparenz.de/EnWG/Offshore-Haftungsumlage/Offshore-Haftungsumlagen-Uebersicht>

⁵³ Reductions start at consumption of over 1 GWh/year. The EEG-Umlage is only partially due on the consumption of self-generated electricity, depending on the nature and the quantity of self-generated electricity (Eigenversorgung). As we do throughout the entire report, we assume here as well that the profiles under review do not produce any electricity

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5. The “*Stromsteuer*” is an electricity tax. Since 2003, the normal tax rate equals 2,05 c€/kWh.⁵⁴
 6. The “*Konzessionsabgabe*” or concession fee is an energy tax that is imposed on all users to fund local governments. The basic rate depends on the size of the municipality as well as on whether the consumer has a “*Grundversorgung*” contract or not. The value for the profiles under study is taken is 1,66 c€/kWh, which is an estimation by Bundesverband der Energie- und Wasserwirtschaft (BDEW) of the average *Konzessionsabgabe* for the profiles under study.⁵⁵
 7. The “*AblV §18 Umlage*” is a levy to finance interruptible load agreements. In 2018 it contributed to the electricity invoice at a value of 0,011 c€/kWh.⁵⁶

Component 4 – VAT

Germany has a VAT of 19% on electricity.⁵⁷

themselves and are hence not concerned by the regulations regarding EEG-Umlage on self-generated electricity.

⁵⁴ Stromsteuergesetz (StromStG) §3 <https://www.gesetze-im-internet.de/stromstg/BJNR037810999.html>

⁵⁵ https://www.bdew.de/media/documents/180109_BDEW_Strompreisanalyse_Januar_2018.pdf p.10

⁵⁶ <https://www.netztransparenz.de/EnWG/Abschaltbare-Lasten-Umlage/Abschaltbare-Lasten-Umlagen-Uebersicht>

⁵⁷ http://www.energieverbraucher.de/de/steuer-auf-gas_2859/

4.3. France

Component 1 – Commodity price

The HHI of the retail market in France is over 6.000 in 2017.⁵⁸ Therefore, only three products will be considered: the standard product, the cheapest product of the market incumbent, and the cheapest offer on the market. The switching rate for household products in France is 5,4%, and the switching rate for non-household consumers was 9,7%.⁵⁹ However, as in France most consumers have the regulated product, an adaptation to the methodology for France is made: the market share for the regulated product is taken as its weight, and the third product has the remainder of the weights.⁶⁰⁶¹

Table 22– Weights attached to the selected products for profiles E1 and E2 in France

Product	Weight E1	Weight E2
Standard product of the market incumbent	80,00%	80,00%
Cheapest product on the market	5,40%	9,70%
Cheapest product of the market incumbent	14,60%	10,30%
Total	100,00%	100,00%

French suppliers offer consumers an ‘all-in tariff’. In order to retrieve the commodity element of the price for France, we therefore needed to deduct the network charges, taxes and VAT from these ‘all-in tariffs’.

The cheapest product was obtained through the price comparison website <http://comparateur-offres.energie-info.fr>. The products selected for profiles E1 and E2 are presented in the tables below. In these prices, taxes (excl. VAT) and charges are included.

Table 23 – Selected products for profile E1 in France

Supplier – Product	Fixed price (€/year)	Electricity cost (c€/kWh)
EDF – Tarif Bleu	101,00	12,23
Cdiscount énergie	101,00	10,82
EDF – Vert électrique	116,00	11,75

⁵⁸ However the interval is known, the exact HHI index is not reported by the CEER. Please see <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f> for more information.

⁵⁹ « Le fonctionnement des marchés de détail français de l’électricité et du gaz naturel rapport 2016-2017 »

⁶⁰ The market share can be found here: “Les marchés de détail de l’électricité et du gaz naturel”, 4ième trimestre 2017, rapport 2016-2017, p.66 for non-residential consumers.

⁶¹ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

Table 24 – Selected products for profile E2 in France

Supplier – Product	Fixed price (€/year)	Electricity cost (c€/kWh)
EDF – Tarif Bleu	335,00	12,23
Total – Prix Fixe	335,00	11,94
EDF – Contrat Garanti	492,00	11,96

Component 2 – Network costs

In France, transmission and distribution costs are integrated. There exist several Distribution System Operators, with Enedis having a market share of 95,00% for continental France.⁶² Therefore, only one DSO will be considered for France.

Distribution tariffs in France are known as the *tarif d'utilisation du réseau public d'électricité* (TURPE). On the first of August 2017, the TURPE 5 tariffs came into force. TURPE 5 consists of 4 tariffs:⁶³

1. *Management component*: The management component depends on whether a consumer has a unique contract or not. For users with a unique contract, the cost is 11,88 €/year.
2. *Component for the access to public distribution grids for clients with a unique contract*: This negative tariff is only applicable for customers with a unique contract, integrating commodity and network charges. The tariff is -6,8€/connection/year for market contracts and -4,5€/connection/year for regulated tariffs.
3. *Metering tariff*: The metering tariff depends on whether the meter is owned by the consumer or not. As the assumption is made that the users don't own their meter, the cost is 19,80 €/year.
4. *Component for taking off electricity*: For this component, three tariff options exist: short utilisation, medium utilisation with a temporal differentiation between peak and off peak hours, and a long utilisation. As temporal differentiation is not possible with a single meter, this option is not considered.

Both short and long utilisation were calculated. This component consists of a part for the electricity taken off and a part for the capacity. The cost for profile E1 is 154,37 €/year for short utilisation and 399,66 €/year for long utilisation, and the cost for profile E2 is 1.990,52 €/year for short utilisation and 2.798,16 €/year for long utilisation. As consumers are considered to be rational, the short utilisation tariff is considered.

Component 3 – Taxes and levies (excluding VAT)

In France, three different surcharges apply to electricity. They are detailed as follows.⁶⁴

1. The “*Contribution tarifaire d'acheminement*” (CTA) is a surcharge for energy sector pensions. For the profiles under study, the CTA amounts to 27,04% of the fixed part of the network tariff.

⁶² <http://www.enedis.fr/english>

⁶³

http://www.enedis.fr/sites/default/files/TURPE_5_plaquette_tarifaire_janvier_2018.pdf

⁶⁴ <http://www.energie-info.fr/Pro/Fiches-pratiques/Ma-facture-mon-compteur/CSPE-TICGN-CTA-TVA-Toutes-les-taxes-sur-ma-facture>

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2. The *Taxes sur la Consommation Finale d'Electricité (TCFE)* is a departmental and municipal tax. A default tax is set on 0,075 c€/kWh, and can be changed by every department with a factor between 2 and 4,25 and by every municipality with a factor between 0 and 8,5.⁶⁵ The possible factors are limited to 0; 2; 4; 6; 8 et 8,50 for municipalities and to 2; 4 and 4,25 for the departments. Almost 80% of the municipalities set the factor at 8,5, leading to a tax of 0,6375 c€/kWh, while almost 90% of all departments set the factor at 4,25, leading to a tax of 0,31875 c€/kWh. As a consequence, these values will be taken into consideration.
 3. The “*Contribution au service public d’électricité*” (CSPE)^{66,67} is a surcharge which feeds a special budgetary program “Public service of energy” that pays (amongst other things) for the cost of support for the production of electricity from natural gas-fired cogeneration plants, the *péréquation tarifaire* (including a small part of cost of renewables) and social tariffs. In 2018, the CSPE is 2,25 c€/kWh.

Component 4 – VAT

A reduced VAT of 5,5% applies on the amount of the subscription as well as on the CTA for the sites whose subscribed power is lower or equal to 36 kVA. A 20% VAT applies on the amount of consumption as well as on the CSPE and on the TCFE.⁶⁸

⁶⁵ <https://www.impots.gouv.fr/portail/taxe-sur-la-consommation-finale-delectricite-tcfe>

⁶⁶ In 2015, the “*Contribution au service public d’électricité*” (CSPE) and « *Taxe intérieure sur la consommation finale*” merged, and were renamed CSPE.

⁶⁷ *Code des douanes*, article 266 quinquies C.

⁶⁸ <http://www.energie-info.fr/Pro/Fiches-pratiques/Ma-facture-mon-compteur/CSPE-TICGN-CTA-TVA-Toutes-les-taxes-sur-ma-facture>

4.4. The Netherlands

Component 1 – Commodity price

The HHI of the retail market in the Netherlands is between 1.500 and 2.000 in 2017.⁶⁹ Therefore, four products will be considered. For E1, these are the standard product, the cheapest product on the market, the cheapest product of the market incumbent and the cheapest product of the second largest supplier. The weight of the cheapest product equals the annual switching rate and was 15,1% in 2016.⁷⁰ As described in the methodology, for countries with more than four products, the normalised markets shares need to be calculated. These can be found in the table below.⁷¹

Table 25– Normalised market shares in the Netherlands

Electricity company	Customers ⁷²	Normalised market share (%)
Essent	3.100.000	59,62%
Eneco	2.100.000	40,38%
Total	5.200.000	100,00%

For E1, the weight of the cheapest product equals the annual switching rate, and was 15,1% for the Netherlands in 2016.⁷³ As the normalised market share of the market incumbent is $3.100.000 / (3.100.000 + 2.100.000) = 59,62\%$, and that of the second largest supplier 40,38%, the product of the market incumbent thus has a weight of $(100\% - 15,1\%) * 59,62\% / 2 = 25,31\%$ and the products of the second largest supplier has thus a weight of $(100\% - 15,1\%) * 40,38\% = 34,28\%$ as is presented in the table below.

For E2, the cheapest product was also a product of the market incumbent. Therefore, conform to the methodology described in section 3.5, the cheapest product was omitted and the two products of the incumbent were weighted equally. The two other products are from the second largest player. The weight of the products for profiles E1 and E2 are presented in the table below.

Table 26– Weights attached to the selected products for profile E1 in the Netherlands

Product	Weight
Standard product of the market incumbent	25,31%
Cheapest product on the market	15,10%
Cheapest product of the market incumbent	25,31%
Cheapest product of the second largest player	34,28%
Total	100,00%

⁶⁹However the interval is known, the exact HHI index is not reported by the CEER. Please see <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aao-0f321b196f9f>
⁷⁰ https://ec.europa.eu/commission/sites/beta-political/files/energy-union-factsheet-netherlands_en.pdf

⁷¹ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

⁷² The number of customers is an approximation. <https://www.energieportal.nl/wp-content/uploads/2016/02/Energieleveranciers-werkzaam-in-Nederland.jpg>

⁷³ https://ec.europa.eu/commission/sites/beta-political/files/energy-union-factsheet-netherlands_en.pdf

Table 27– Weights attached to the selected products for profile E2 in the Netherlands

Product	Weight
Standard product of the market incumbent	29,80%
Cheapest product of the market incumbent	29,80%
Cheapest product of the second largest player (fixed or variable)	20,20%
Cheapest product of the second largest player (variable or fixed)	20,20%
Total	100,00%

The cheapest product was obtained through consulting the price comparison website <https://www.energieleveranciers.nl/>. The products selected for profiles E1 and E2 and their prices are stated in the next tables. The prices are without charges and taxes.

Table 28 – Selected products for profile E1 in the Netherlands

Supplier – Product	Abonnement (€/year)	Electricity cost (c€/kWh)
Essent – Modelcontract Elek. & Gas Variabel	41,52	5,27
LEON – Zeewolde Modeltarief	25,00	5,69
Energiedirect (Essent) – Groene Stroom 1 jaar Vast	37,20	5,37
Eneco – EcoStroom 3 jaar Vast	47,50	6,65

Table 29 – Selected products for profile E2 in the Netherlands

Supplier – Product	Abonnement (€/year)	Electricity cost (c€/kWh)
Essent – Modelcontract Elek. Zakelijk Variabel	83,88	5,77
Energiedirect (Essent) – Groene Stroom 1 jaar Vast	83,88	4,99
Eneco – EcoStroom Variabel	71,88	4,83
Eneco – EcoStroom 3 jaar Vast	71,88	5,69

The cheapest product was the product of the second largest supplier (EcoStroom 3 jaar vast). Energiedirect is a subsidiary of Essent.

Component 2 – Network costs

In the Netherlands, the network costs involve four components⁷⁴:

1. *Standing charge*;
2. *Metering charge*;

⁷⁴ <https://www.acm.nl/nl/onderwerpen/energie/afnemers-van-energie/energiecontracten--/waar-betaalt-u-voor>

3. *Periodical connection tariff;*
4. *Transport service tariff (capacity tariff).*

For profile E1, > 1 x 10A t/m 3 x 25A tariff was used, while for profile E2, the 3 x 63A t/m 3 x 80A tariff was used.

As is the case in Germany, the distribution and transmission tariffs are integrated. As explained before, we will present a weighted average of the seven distribution zones.

Component 3 – Taxes and levies (excluding VAT)

In general, two surcharges apply to the electricity invoice for the profiles under study:

1. The *Energy Tax* (Regulerende Energie Belasting (REB)) is a digressive tax on all energy carriers. A reduction of taxes of 308,54 €/year is granted to every electricity connection for residential purposes.
2. The *ODE Levy* (Opslag Duurzame Energie (ODE)) is a digressive levy, except for the first 10 MWh, on natural gas and electricity that pays for renewable capacity.

The rates for the Energy Tax and ODE Levy for electricity in 2018 are presented in the tables below.

Table 30 – Tariffs for Energy Tax (Regulerende Energie Belasting (REB))⁷⁵

Band	Consumption	c€/kWh
A	up to 10.000 kWh	10,458
B	10.000-50.000 kWh	5,274
C	50.000-10.000.000 kWh	1,404
D	above 10.000.000 kWh (residential)	0,116
E	above 10.000.000 kWh (professional)	0,057

⁷⁵

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen/tarieven_milieubelastingen?projectid=6750bae7-383b-4c97-bc7a-802790bd1110

Table 31 – Tariffs for ODE Levy (Opslag Duurzame Energie (ODE))⁷⁶

Band	Consumption	c€/kWh
A	up to 10.000 kWh	1,3200
B	10.000-50.000 kWh	1,8000
C	50.000-10.000.000 kWh	0,4800
D	above 10.000.000 kWh (residential and professional)	0,0194

Component 4 – VAT

Residential customers need to pay 21 % over their electricity invoice.⁷⁷

⁷⁶

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen_tarieven_milieubelastingen?projectid=6750bae7-383b-4c97-bc7a-802790bd1110

⁷⁷

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/btw/tarieven_en_vrijstellingen/goederen_diensten_21_btw/goederen_diensten_21_btw

4.5. United Kingdom

Suppliers in the UK often offer their clients a so-called dual fuel tariff which is a contract that combines electricity and natural gas in one product. To be consistent with the methodology we have used for the other countries, we consider only products in which electricity is offered by itself. Tariffs of suppliers in the UK are not very transparent as the tariffs are generally presented as ‘all-in tariffs’ (including commodity prices, network charges, taxes and VAT) which consist of:

- A fixed element, *Standing Charge*, expressed in p/day that covers the fixed costs of the energy supplier and is the same for any consumer in any region of the UK and;
- A variable element, *Unit Rate Charge*, expressed in p/kWh, which differs according to the region in which the supplier has contracted the consumer.

In order to retrieve the commodity element of the price for the United Kingdom, we therefore needed to deduct the network charges, taxes and VAT from these ‘all-in tariffs’⁷⁸. As commodity prices are not very different between regions and for sake of simplicity⁷⁹, a median commodity price will be used for all 14 DSO regions. Based on an Ofgem study from 2015, Yorkshire is the median zone in terms of commodity price. In order to obtain the commodity price for the Yorkshire region, we deduct the Yorkshire region network cost from the all in tariff, together with the VAT and taxes.

The weighted average of network tariffs for all DSOs will be used to determine the network cost (similar to other countries under review).

When considering products from various suppliers, we have always taken the monthly direct debit option into account, as it seems to be often the mostly used option. Most suppliers don’t publish different tariffs for domestic and small professional consumers, but tend to negotiate tariffs with small professional consumers directly. As tariffs for small professional consumers are not publicly available, we assume that small professional consumers pay the same ‘all-in’ tariffs as domestic consumers.

Component 1 – Commodity price

The HHI of the retail market in the United Kingdom is below 2.000 in 2017.⁸⁰ Therefore, four products will 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. As the standard product of the incumbent is also its cheapest product, we took the second cheapest product of the second largest supplier into account as the fourth product.⁸¹

⁷⁸ For more information on the different components of a electricity invoice in the United Kingdom, see

https://www.ofgem.gov.uk/system/files/docs/2017/03/supplier_cost_index_-_methodology_v1.1_0.pdf

⁷⁹ According to a study of October 2015 by Ofgem, commodity prices, including taxes, range between £354 and £373 annually between the 14 DSOs. Taking the median commodity price over- or underestimates the commodity price with maximum £10 pounds. See https://www.ofgem.gov.uk/sites/default/files/docs/2015/10/reg_charges_final_master_version_23_october_2015.pdf

⁸⁰ However the interval is known, the exact HHI index is not reported by the CEER. Please see <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f>

⁸¹ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

The table below presents the market shares⁸² of the two largest electricity suppliers in the United Kingdom, for which we have normalised the market shares of the suppliers taken into account (British Gas and SSE).

Table 32 – Electricity supply market shares by company (Q3 2017) for residential consumers

Electricity company	Market share ⁸³ (%)	Normalised market share (%)
British Gas	21%	60,00%
SSE	14%	40,00%
Other	65%	
Total	100%	100,00%

For E1, the weight of the cheapest option equals the annual retail switching rate, and the annual switching rate for electricity is 15,8% for household customers and 15,6% for non-household customers in the United Kingdom.⁸⁴ For E1, as the normalised market share of the market incumbent is $(21\%/35\%) = 60,00\%$, and that of the second largest supplier $(14\%/35\%) = 40,00\%$, the product of the market incumbent thus has a weight of $(100\% - 15,80\%) * 60,00\% = 50,52\%$ and the products of the second largest supplier has thus a weight of $((100\% - 15,80\%) * 40\%)/2 = 16,84\%$ as is presented in the table below. The weights of E2 are calculated accordingly.

Table 33 – Weights attached to the selected products for profiles E1 and E2 in the UK

Product	Weight E1	Weight E2
Standard product of market incumbent	50,52%	50,64%
Cheapest product on the market	15,80%	15,60%
Cheapest product of the second largest market player	16,84%	16,88%
Second cheapest product of the second largest market player	16,84%	16,88%
Total	100,00%	100,00%

An overview of the products we have selected per region and their respective tariff elements are presented in the following table. The cheapest product has been selected through the price comparison website of www.uswitch.co.uk.

⁸² <https://www.ofgem.gov.uk/data-portal/electricity-supply-market-shares-company-domestic-gb>

⁸³ Only rounded figures available, see section on market structure on the website of Ofgem <https://www.ofgem.gov.uk/data-portal/retail-market-indicators>

⁸⁴ <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aao-9f321b196f9f> p. 37 for household switching rates and p.41 for non-household switching rates.

Table 34 – Selected products for profiles E1 and E2 in the United Kingdom

Supplier – Product	Standard unit charge (p/day)	Standard unit rate (p/kWh)
British Gas – Standard	24,77	13,85
Powershop – Easy Saver Promise v2 ⁸⁵	16,56	12,05
SSE – 1 Year Fixed v14	14,10	14,30
SSE – Standard DD	14,10	15,14

Component 2 – Network costs

The network structure in the United Kingdom has been described above on geographical level with three TSOs, six DSOs and fourteen tariff zones identified. Our residential and small professional consumers pay both distribution and transmission charges.

Transmission costs

Transmission Network Use of System (TNUoS) charges in the UK have two different rates: half-hourly (HH) metered customers pay a capacity tariff in function of their power subscription, while customers who are not half-hourly metered pay a demand rate in function of their electricity consumption. Profiles E1 and E2 are not half hourly metered and hence pay the demand rate, expressed in p/kWh. This NHH tariff is zonal: there is a different rate for all fourteen zones of the UK. These demand rates need to be applied to the aggregated annual energy flow of the consumer between 4 PM and 7 PM, for which we followed the assumption from Ofgem that approximately 18% of the annual electricity demand can be considered as peak demand⁸⁶.

We present a weighted average value of these fourteen zonal tariffs as transmission cost for profiles E1 and E2.

Distribution costs

Distribution charges, which are due for both profiles E1 and E2, follow a different methodology according to the connection voltage. Both the residential and small professional consumers pay the NHH tariff of the Common Distribution Charging Methodology (CDCM) and are invoiced for total consumption (unit charge in p/kWh) and a fixed charge per offtake point (p/MPAN/day). Furthermore, supplier energy charges in Great Britain include metering costs. To provide better comparability with the continental countries, we estimated metering costs as 1 per cent of the electricity bill and added this to the distribution component.

For profiles E1 and E2 we have respectively taken the so-called Domestic Unrestricted and Small Non Domestic Unrestricted rates of each DSO into account, which are then weighted according to the number of connection points of each of the fourteen zonal tariff zones (DSOs).

Component 3 – Taxes and levies (excluding VAT)

Three different extra costs are identified for the UK: two levies and the indirect cost of one renewable subsidies scheme.

⁸⁵ Powershop is one of the suppliers belonging to the category ‘Other’ in Table 32.

⁸⁶ See Ofgem on “Regional Differences in Network Charge”, p.44

(https://www.ofgem.gov.uk/sites/default/files/docs/2015/10/reg_charges_final_master_version_23_october_2015.pdf)

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1. Energy suppliers need to account for the cost of the **Energy Company Obligation (ECO)** scheme, which helps to reduce carbon emissions and tackle fuel poverty. The cost of the ECO scheme amounts to roughly €18,13⁸⁷ per year.
 2. The **Climate Change Levy (CCL)** is a levy payable on electricity, natural gas, fuel, etc. Its basic rate for electricity consumption as from 1st of April 2017 is 0,639 c€/kWh (0,568p/kWh), but residential consumers are exempted from it⁸⁸.
 3. The **Renewables Obligation (RO)** is the cost taken into account by energy suppliers for the large scale renewable subsidy scheme. From April 2017 to April 2018, the renewable quota is 0,409 Renewable Obligation Certificates (ROC's) per MWh. The buy-out price per missing ROC of £45,58 is a penalty for non-ROC-covered electricity and, multiplied by the renewable quota of 0,409 amounts to 2,096 c€/kWh for both consumer profiles.

Component 4 – VAT

VAT on electricity for domestic and residential use in the UK amounts to 5%⁸⁹.

⁸⁷ To calculate the estimated cost of the ECO scheme, we take the Ofgem assumption that 14,79% of the electricity invoice consists out of environmental and social obligation (91,95 € annually). As 73,81 € of the electricity invoice for domestic consumers is attributed to the ROC, the remaining 18,1 € is due because of the ECO scheme, see <https://www.ofgem.gov.uk/consumers/household-gas-and-electricity-guide/understand-your-gas-and-electricity-invoices>

⁸⁸ <https://www.gov.uk/government/publications/rates-and-allowances-climate-change-levy/climate-change-levy-rates>

⁸⁹ <https://www.gov.uk/guidance/rates-of-vat-on-different-goods-and-services#power>

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

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

5.1. Belgium

As is the case for electricity, tariff sheets of natural gas suppliers in Belgium are very transparent. Furthermore, most suppliers publish their previous tariffs online and give a detailed view on how the final tariff is built up. In general, most products detail all elements of the following charges: energy prices, distribution and transport charges, taxes, levies and surcharges and VAT.

Component 1 - Commodity price

The HHI of the retail market in Belgium is over 2.000 in 2017.⁹⁰ Therefore, only three products will be considered: the standard product, the cheapest product on the market and the cheapest product of the market incumbent. When the standard product of the incumbent is also its cheapest product, we took the cheapest product of the second biggest supplier⁹¹ for each of the regions into account.⁹²

The weight of the cheapest option equals the annual retail switching rate, and is 15,8% for Belgium. The products of the market incumbent have thus a weight of $(100\% - 15,80\%) / 2$ or 42,10 % each. The weight of the products for profiles G1 and G2 are presented in the table below.

Table 35 – Weights attached to the selected products for profiles G1 and G2 in Belgium

	Weight G1	Weight G2
Standard product of the market incumbent	42,10 %	42,10 %
Cheapest product on the market	15,80 %	15,80 %
Cheapest product of the market incumbent	42,10 %	42,10 %
Total	100,00 %	100,00 %

An overview of the products we have selected per region and the rates for the energy component (exclusive VAT) are presented in the table below. The cheapest products have been selected through the price comparison websites of the respective regional regulators: <https://vtest.vreg.be> for Flanders, www.compacwape.be for Wallonia and www.brusim.be for Brussels.

⁹⁰ However the interval is known, the exact HHI index is not reported by the CEER. Please see <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f> for more information.

⁹¹ EDF Luminus in Flanders and Wallonia, Lampiris in Brussels

⁹² For a more detailed description of the methodology used for the commodity price – please see section 3.5.

Table 36 – Selected products for profile G1 in Belgium

Region	Supplier – Product	Fixed component (€/year)	Price per kWh (c€/kWh)
Flanders	ENGIE – Easy Indexed	35,00	2,84
	Lampiris – Online	28,93	2,22
	ENGIE – Direct	15,00	2,22
Wallonia	ENGIE – Easy Indexed	35,00	2,84
	Lampiris – Online	28,93	2,22
	ENGIE – Direct	15,00	2,22
Brussels	ENGIE – Easy Indexed	35,00	2,84
	Lampiris – Online	28,93	2,22
	ENGIE – Direct	15,00	2,22

Table 37 – Selected products for profile G2 in Belgium

Region	Supplier – Product	Fixed component (€/year)	Price per kWh (c€/kWh)
Flanders	ENGIE – Easy Pro Indexed	35,00	2,84
	ENGIE – Direct Pro	15,00	2,22
	Luminus – Basic.PRO	20,00	2,25
Wallonia	ENGIE – Easy Pro Indexed	35,00	2,84
	ENGIE – Direct Pro	15,00	2,22
	Luminus – Basic.PRO	20,00	2,25
Brussels	ENGIE – Easy Pro Indexed		
	ENGIE – Direct Pro	35,00	2,84
	Total Gas & Power Belgium - Digital Variable Natural Gas ⁹³	15,00	2,22
		20,00	2,43

Component 2 - Network costs

Transmission costs

As discussed in the consumer profiles, we assume that profiles G1 and G2 are part of the second lowest category on the distribution grid (T2). In Belgium, the transmission costs for a residential and small professional consumers are not easy to calculate. Therefore, we base us on an estimation by the TSO for natural gas, Fluxys⁹⁴. The estimation of the cost of transport for a residential or small professional consumer, includes entry and exit tariffs and takes into account a weighted average of L and H natural gas.

Table 38 – Transmission cost for natural gas in Belgium

TSO	Transmission cost (c€/kWh)
Fluxys	0,151

⁹³ Lampiris is the second largest supplier in the Brussels Capital Region but operates under the brand of TOTAL & Gas Power Belgium for small professional consumers.

⁹⁴ See

http://www.fluxys.com/belgium/en/Services/Transmission/TransmissionTariffs/~/_media/Files/Services/Transmission/Tariffs/2018/Fluxys_CostEstimation_DomesticExit%202018_EN.ashx

Distribution costs

As stated above, both consumer profiles are connected to the distribution grid, so additional distribution tariffs next to the transmission costs are charged by the DSO to the consumer. In our study, we select the tariffs for the second lowest consumer category on the distribution grid (i.e. T2).⁹⁵ For each Belgian region, natural gas distribution tariffs typically have three components⁹⁶:

1. *Fixed component*;
2. *Proportional component*;
3. *Tariff for the measuring activities*.

For each region of Belgium, we compute the tariff through a weighted average of each component across all DSOs active in the region (weights are given in terms of EAN connection points per DSO in 2017). As stated above, for the Flemish region, all DSOs operated by INFRAX or EANDIS, were taken into account⁹⁷. For the Walloon region, all DSOs operated by ORES, as well as RESA, GASELWEST, Régie de Wavre, AIEG and AIESH were taken into account.

Component 3 - Taxes and levies (excluding VAT)

In Belgium, two extra costs are charged to all of our natural gas consumers under review:

1. *Federal contribution* (0,05758 c€/kWh), increased with 1,1% by the supplier, on which no VAT is due;
2. *Energy contribution* (0,09978 c€/kWh), for which complete exemption for consumers that use natural gas as a raw material for their industrial process or reduced rates (0,054 c€/kWh) exist for users that are part of an energy efficiency agreement in their region. As our consumers don't use natural gas as a raw material and are too small to have concluded an energy efficiency agreement, they pay the full rate of the energy contribution (0,09978 c€/kWh), on which VAT is due.

Aside from those two federal taxes, two regional taxes exist in the Brussels Capital Region and Wallonia:

1. A *Brussels regional public service obligation*, which depends on the calibre of the meter being installed. For our residential and small professional consumer we have assumed the meters process between 6 and 10 m³, for which the annual surcharge amounts to 9,12 €/year, on which VAT is due.
2. The *connection fee* in the Walloon region (0,075 c€/kWh) which is a tax on grid connection with digressive rates. The rate for residential and small professional consumers of 0,075 c€/kWh applies both to profile G1 and G2, on which no VAT is due.

For those consumers connected to the distribution grid (T2), local distribution taxes and levies⁹⁸ have to be added to federal and regional taxes, who are summarized per region in the table below.

⁹⁵ Consumers who consume between 5.001 and 150.000 kWh (T2) of natural gas on an annual basis are considered as consumer category T2 for network tariffs.

⁹⁶ The tariffs for Flanders can be found on the website of the VREG, see <http://www.vreg.be/nl/distributienettarieven-elektriciteit-en-aardgas-2018>; the tariffs for Wallonia on the website of the CWaPE, see <https://www.cwape.be/?lg=1&dir=7.3.6> and the tariffs for Brussels on the website of Sibelga, see <https://www.sibelga.be/nl/tarieven/tarieven-netgebruik/distributiekosten/gas>.

⁹⁷ Enexis, active in the Belgian enclave of Baarle-Hertog, is not considered in the study.

⁹⁸ For each region of Belgium, we compute the tariffs through a weighted average of each component across all DSO active in the region (weights are given in terms of number of EAN connection points per natural gas DSO in 2017). As stated above, for the Flemish region, all DSOs operated by INFRAX or EANDIS were taken into account (representing 100% of EAN

Table 39 – Overview of distribution taxes and levies for natural gas

Region	Flanders	Wallonia	Brussels
Public Service Obligations	✓	✓	✓
Expenses for unfunded pensions	✓	✓	✓
Corporate taxes and taxes for legal persons		✓	✓
Other local, provincial or regional taxes (for example for the occupation of the road network)	✓	✓	✓

Component 4 – VAT

VAT on natural gas for residential consumers in Belgium amounts to 21% and will be presented as a different price component. No VAT is due on the federal contribution and the connection fee in the Walloon region.

connection points in 2017). For the Walloon region, all 7 DSOs operated by ORES, RESA and GASELWEST were taken into account (representing 100% of EAN connection points in 2017).

5.2. Germany

In Germany, natural gas suppliers generally present only two tariffs on their tariff sheets, a fixed tariff per month (in €/month), the “Grundpreis”, and a variable tariff per kWh of natural gas consumed (in c€/kWh). These tariffs are ‘all-in tariffs’, from which network costs, taxes and VAT will be deducted to retrieve the commodity component.

Component 1 – Commodity price

For the natural gas profiles of Germany, the HHI index was 300 in 2014.⁹⁹ Yet – given the fragmented market - no market shares could be determined, which makes it impossible to select the second largest supplier. The methodology was therefore adapted, and only three products were to be considered: the standard product, the cheapest offer on the market and the cheapest product of the market incumbent. This change is justified through its 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. Therefore, for every DSO, the standard product was determined. To retrieve the cheapest product on the market, we have used the German comparison website www.stromvergleich.de.¹⁰⁰

The weight of the cheapest option equals the annual retail switching rate, and is 12,3% for household consumers and 11,0% for non-household consumers in Germany.¹⁰¹ The products of the market incumbent have thus a weight of $(100 \% - 12,30 \%) / 2$ or 43,85 % each for household consumers and a weight of $(100 \% - 11,00 \%) / 2$ or 44,50 % each for non-household consumers. The weight of the products for profiles G1 and G2 are presented in the table below.

Table 40 – Weights attached to the selected products for profiles G1 and G2 in Germany

	Weight G1	Weight G2
Standard product of the market incumbent	43,85%	44,50%
Cheapest product on the market	12,30%	11,00%
Cheapest product of the market incumbent	43,85%	44,50%
Total	100,00 %	100,00 %

German suppliers offer consumers an ‘all-in tariff’. In order to retrieve the commodity element of the price for Germany, we therefore needed to deduct the network charges, taxes and VAT from these ‘all-in tariffs’. The prices reported here are excl. VAT, but include other taxes and charges.

⁹⁹

https://ec.europa.eu/energy/sites/ener/files/documents/2014_energy_market_en_o.pdf

¹⁰⁰ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

¹⁰¹ <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f> p. 37 for household switching rates and p.41 for non-household switching rates.

Table 41 – Selected products for profile G1 in Germany

DSO	Supplier – Product	Grundpreis (€/year)	Arbeitspreis (c€/kWh)
Westnetz	Innogy – Erdgas Klassik	111,00	5,87
	BEV Energie – Energie Gas	165,28	4,17
	Innogy – Erdgas Smart	80,00	5,69
RNG Netz	RheinEnergie – FairRegio	124,88	4,65
	BEV Energie – Energie Gas	190,08	3,93
	RheinEnergie – FairRegio Erdgas	140,00	4,20
	Konstant 2019		
Bayernwerk	E.ON – Grundversorgung Erdgas	192,00	4,57
	Immergrün Energie – SparKlassik	87,23	4,36
	Premium12	150,00	4,75
SWM Infrastruktur	Stadtwerke München – M-Erdgas		
	Immergrün Energie – SparKlassik	111,60	4,47
	Premium12	70,79	3,88
	Stadtwerke München – Erdgas Direkt	83,96	3,84
NBB Netzgesellschaft	GASAG – Erdgas Komfort	156,00	4,84
	BEV Energie – Energie Gas	58,29	3,84
	GASAG – Erdgas Smart	160,84	3,66
E.Dis Netz	E.ON – Grundversorgung Erdgas	168,72	6,19
	BEV Energie – Energie Gas	114,96	3,86
	E.ON – Klassik Erdgas	180,00	5,45
Stuttgart Netz	StadtWerke Karlsruhe – BasisGas		
	Immergrün – SparKlassik	162,05	5,00
	Premium12	72,81	4,25
	StadtWerke Karlsruhe – VorteilsGas	144,00	4,10
Netze BW	EnBW – Erdgas Plus	86,02	4,83
	BEV Energie – Energie Gas	49,82	4,34
	EnBW – Ideal Gas	109,31	4,46

Table 42 – Selected products for profile G2 in Germany

DSO	Supplier – Product	Grundpreis (€/year)	Arbeitspreis (c€/kWh)
Westnetz	Innogy – Erdgas Klassik	-	6,10
	E.ON – Gas Fix 12 Oko	115,36	3,37
	Innogy – Erdgas Smart	80,00	5,69
RNG Netz	RheinEnergie – TradeRegio Erdgas		
	Basis	143,19	3,91
	E.ON – Gas Fix 12 Oko	113,34	3,14
	RheinEnergie – TradeRegio Erdgas Plus	117,65	3,53
Bayernwerk	E.ON – Grundversorgung Erdgas	192,00	4,57
	ENBW – Erdgas Gewerbe Online	104,77	3,60
	E.ON – Klassik Erdgas	116,66	4,48
SWM Infrastruktur	SWM Versorgung – M-Erdgas	111,63	4,47
	ENBW – Erdgas Gewerbe Online	100,54	3,10
	SWM – M-Erdgas Direkt	70,55	3,23

NBB Netze Gesellschaft	GASAG – Komfort Business	252,00	5,20
	ENBW – Erdgas Gewerbe Online	90,76	3,29
	GASAG – Erdgas Fix	135,13	3,27
E.Dis Netz	E.ON – Grundversorgung Erdgas	192,00	4,57
	ENBW – Erdgas Gewerbe Online	90,76	3,28
	E.ON – Unternehmer Gas Online	-	3,01
Stadtwerke Karlsruhe	StadtWerke Karlsruhe – BasisGas	-	5,20
	ENBW – Erdgas Gewerbe Online	103,87	3,55
	StadtWerke Karlsruhe – VorteilsGas	-	3,70
Netze BW	EnBW – Erdgas Plus	86,02	4,83
	MAINGAU – GasRegio	42,35	3,08
	EnBW – Ideal Gas Profi	109,31	4,46

Component 2 - Network costs

In order to keep the methodology consistent with the one we have presented for Germany, and as both our profiles are connected to the distribution grid, the tariffs of 8 different DSOs (4 rural, 4 urban) are being considered. For our residential and small professional consumption profiles, transmission and distribution costs are integrated in one single tariff. Although every DSO uses different bands and different rates, these tariffs comprise the same three components:

1. *Basic charge or “Grundpreis” (in €/year)*: a fixed element of the network cost which depends upon the annual consumption of natural gas;
2. *Labour charge or “Arbeitspreis” (in c€/kWh)*: a variable element of the network cost which depends upon the volume of energy consumed in kWh per year;
3. *Metering or “Messung” and metering point operation per counting point charges or “Messstellenbetrieb” (in €/year)*: fixed charges related to the cost of metering and invoicing, fixed prices. We assume our residential and small professional consumer to have be metered annually and belong to the meter group “Standardgaszähler ≤ G6”.

Component 3 – Taxes and levies (excluding VAT)

Two additional costs on natural gas exist for consumers in Germany: the Gas tax (i.e. “Energiesteuer – Erdgassteuer”) and the Concession fee (i.e. “Konzessionsabgabe”):

3. The “Energiesteuer” is an energy tax, with different rates for different sources of energy. The normal tax rate for residential and small professional consumers amounts to 0,550 c€/kWh.
4. The “Konzessionsabgabe” (concession fee) that exists for electricity also applies to natural gas consumption and the basic rate depends on the size of the municipality as well as on whether the consumer has a “Grundversorgung” contract or not. As it is not possible to calculate a weighted average for the “Konzessionsabgabe”, the value we have used for the profiles under study is 0,305 c€/kWh, which is the normal average “Konzessionsabgabe” for the four categories of municipalities¹⁰².

Component 4 – VAT

VAT on the consumption of natural gas for residential consumers in Germany amounts to 19% and will be presented as a different price component.

¹⁰² <https://www.gesetze-im-internet.de/kav/KAV.pdf>

5.3. France

Component 1 – Commodity price

The HHI of the retail market in France is over 5.000 in 2017.¹⁰³ Therefore, only three products will be considered: the standard product, the cheapest product on the market and the cheapest product of the market incumbent.¹⁰⁴

The weight of the cheapest option equals the annual switching rate, and is 10,4% for household consumers and 15,2% for non-household consumers in France.¹⁰⁵ The products of the market incumbent have thus a weight of 89,60%/2 or 44,80% each for household consumers, and 84,80%/2 or 42,40% for non-household consumers. The weight of the products for profiles G1 and G2 are:

Table 43– Weights attached to the selected products for profiles G1 and G2 in France

	Weight G1	Weight G2
Standard product of the market incumbent	44,80%	42,40%
Cheapest product on the market	10,40%	15,20%
Cheapest product of the market incumbent	44,80%	42,40%
Total	100,00%	100,00%

French suppliers offer consumers an ‘all-in tariff’. In order to retrieve the commodity element of the price for France, we therefore needed to deduct the network charges, taxes and VAT from these ‘all-in tariffs’.

The cheapest product was obtained through the price comparison website <http://comparateur-offres.energie-info.fr>. The products selected for profiles G1 and G2 and their prices are stated in the next tables. For profile G2, as only one product of the market incumbent was found, instead of a second product by the market incumbent a product of the second largest player was selected. In these prices, all taxes, and charges are included, except for the VAT.

Table 44 – Selected products for profile G1 in France

Supplier – Product	Abonnement (€/year)	Commodity cost (c€/kWh)
ENGIE – Tarif réglementé	220,00	4,78
Alterna – Idea Gaz naturel	376,00	3,58
ENGIE – Gaz naturel Energie garantie 1 ans	220,00	5,89

¹⁰³ However the interval is known, the exact HHI index could not be found.

<https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f>

¹⁰⁴ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

¹⁰⁵ Le fonctionnement des marchés de détail français de l’électricité et du gaz naturel rapport 2016-2017

Table 45 – Selected products for profile G2 in France

Supplier – Product	Abonnement (€/year)	Commodity cost (c€/kWh)
ENGIE – Pro	186,84	4,81
Dyneff – Contrat Malin	229,80	4,59
Eni – Fixeo	209,04	5,04

As mentioned before, these prices are the median prices of the six tariff zones in France.

Component 2 – Network costs

For natural gas, both transmission (ATRT) and distribution (ATRD) costs exist.

Transmission costs

Two components exist:

1. *Transport cost;*
2. *Storage cost.*

The CREG provided PwC with the data necessary to filter these two elements out of the distribution tariffs.

Distribution costs

As stated before, GrDF (Gaz Réseau Distribution France) delivers 96% of all distributed natural gas in France.¹⁰⁶ This is an integrated tariff meaning that it includes transmission costs. It is assumed that both profiles G1 and G2 take tariff option T2, as this tariff is the cheapest for the profiles under study. This tariff has two components¹⁰⁷:

1. *A fixed charge per year per delivery station (139,44 €/year);*
2. *A proportional component (0,00082 c€/kWh).*

Component 3 – Taxes and levies (excluding VAT)

In France, two surcharges apply on natural gas:

1. The “*Contribution tarifaire d’acheminement*” (CTA) is a surcharge for energy sector pensions. For clients connected to the distribution grid, the CTA amounts to 20,8% of the fixed part of the distribution cost.¹⁰⁸
2. The “*Taxe intérieure sur la consommation de gaz naturel*” (TICGN) is a tax on natural gas consumption, that amounted to 0,84500 c€/kWh in 2018.¹⁰⁹

Component 4 – VAT

A reduced VAT of 5,5% applies on the amount of the subscription as well as on the CTA. A 20% VAT applies on the amount of consumption as well as on the TICGN.¹¹⁰

¹⁰⁶ <http://www.cre.fr/reseaux/infrastructures-gazieres/description-generale#section3>

¹⁰⁷ <https://www.grdf.fr/documents/10184/1291504/ATRD55-TraitementTarifaire/ba82d854-6423-451a-af0a-18e952b2b921>

¹⁰⁸ <https://www.legifrance.gouv.fr/eli/arrete/2013/4/26/DEV1311122A/jo>

¹⁰⁹ <https://www.legifrance.gouv.fr/eli/arrete/2013/4/26/DEV1311122A/jo>

¹¹⁰ <http://www.energie-info.fr/Pro/Fiches-pratiques/Ma-facture-mon-compteur/CSPE-TICGN-CTA-TVA-Toutes-les-taxes-sur-ma-facture>

5.4. The Netherlands

Component 1 – Commodity price

The HHI of the retail market in the Netherlands is between 1.500 and 2.000 in 2017.¹¹¹ Therefore, four products will be considered: the standard product, the cheapest product on the market, the cheapest product of the market incumbent and the cheapest product of the second largest supplier.¹¹²

Table 46– Normalised market shares in the Netherlands

Natural gas company	Customers ¹¹³	Normalised market share (%)
Essent	3.100.000	59,62%
Eneco	2.100.000	40,38%
Total	5.200.000	100,00%

The weight of the cheapest product equals the annual switching rate, and was 15,1% for the Netherlands in 2016.¹¹⁴ As the normalised market share of the market incumbent is $3.100.000 / (3.100.000 + 2.100.000) = 59,62\%$, and that of the second largest supplier 40,38%, the product of the market incumbent thus has a weight of $(100\% - 15,1\%) * 59,62\% / 2 = 25,31\%$ and the products of the second largest supplier has thus a weight of $(100\% - 15,1\%) * 40,38\% = 34,28\%$ as is presented in the table below.

The cheapest product was obtained through consulting the price comparison website <https://www.energieleveranciers.nl/>. The weight of the products for profiles G1 and G2 are presented in the table below.

Table 47– Weights attached to the selected products for profiles G1 and G2 in the Netherlands

	Weight G1	Weight G2
Standard product of the market incumbent	25,31%	25,31%
Cheapest product on the market	15,10%	15,10%
Cheapest product of the market incumbent	25,31%	25,31%
Cheapest product of the second largest player	34,28%	34,28%
Total	100,00%	100,00%

As described in section 3.4, 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.

¹¹¹ However the interval is known, the exact HHI index could not be found.

<https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f>

¹¹² For a more detailed description of the methodology used for the commodity price – please see section 3.5.

¹¹³ The number of customers is an approximation. <https://www.energieportal.nl/wp-content/uploads/2016/02/Energieleveranciers-werkzaam-in-Nederland.jpg>

¹¹⁴ https://ec.europa.eu/commission/sites/beta-political/files/energy-union-factsheet-netherlands_en.pdf

The products selected for profiles G1 and G2 and their prices are stated in the next tables. These prices exclude charges and taxes.

Table 48 – Selected products for profile G1 in the Netherlands

Supplier – Product	Abonnement (€/year)	Natural Gas cost (c€/m ³)
Essent – Modelcontract Elektriciteit & Gas variabel	50,00	31,30
Greenchoice – Groen uit Nederland	40,00	25,70
Essent – Zekerheidsgarantie groene stroom en gas	50,00	33,86
Eneco – Aardgas	47,50	32,68

Table 49 – Selected products for profile G2 in the Netherlands

Supplier – Product	Abonnement (€/year)	Natural Gas cost (c€/m ³)
Essent – Modelcontract Elektriciteit Zakelijk variabel	84,00	25,60
Total – Aardgas vast 3 jaar	167,00	20,49
Essent – Vast en Zeker	60,00	26,54
Eneco – Aardgas vast	72,00	26,84

Prices in the Netherlands are reported by m³ instead of by kWh. Therefore, a conversion factor is used. The conversion factor of 9,77 kWh/m³ is used, as all residential and small users use low caloric natural gas.¹¹⁵

Component 2 – Network costs

The Netherlands have integrated distribution and transmission tariffs. The charges are:¹¹⁶

1. *Vastrecht*: a charge for the fixed costs.
2. *Capaciteitstarief*: a charge for the capacity of the user.
3. *Periodieke aansluitvergoeding*: a charge for the connection.
4. *Meterhuur*: a charge for the meter.

For profile G1, the tariff G4 of $G6 \leq 10 \text{ m}^3/\text{h}$ ($\geq 500 < 4000 \text{ m}^3/\text{year}$) was selected, while for G2, the tariff G4 of $G6 \leq 10 \text{ m}^3/\text{h}$ ($\geq 4000 \text{ m}^3/\text{year}$) was selected.

¹¹⁵ Based on the Groningen-gas equivalent of 35,17 per m³.

<https://www.gasuniettransportservices.nl/en/transparency/dataport/explanation-network-points>

¹¹⁶ <https://www.acm.nl/nl/onderwerpen/energie/afnemers-van-energie/energiecontracten---/waar-betaalt-u-voor>

Component 3 – Taxes and levies (excluding VAT)

Two surcharges apply to the natural gas invoice for the profiles under study in the Netherlands:

1. Energy Tax, or “Regulerende Energiebelasting” (REB) is a digressive tax on all energy carriers;
2. *The ODE levy* (“Opslag duurzame energie”) is a digressive levy on natural gas and electricity that pays for renewable capacity.

The tables below show the 2018 rates for each band of natural gas consumption.

Table 50 – Tariffs for Energy Tax (Regulerende Energiebelasting (REB))¹¹⁷

Band A	Consumption up to 170.000 m ³	26,001 c€/m ³
Band B	Consumption from 170.000-1.000.000 m ³	6,464 c€/m ³
Band C	Consumption from 1.000.000-10.000.000 m ³	2,355 c€/m ³
Band D	Consumption above 10.000.000 m ³	1,265 c€/m ³

Table 51 – Tariffs for ODE levy (Opslag duurzame energie (ODE))¹¹⁸

Band A	Consumption up to 170.000 m ³	2,85 c€/m ³
Band B	Consumption from 170.000-1.000.000 m ³	1,06 c€/m ³
Band C	Consumption from 1.000.000-10.000.000 m ³	0,39 c€/m ³
Band D	Consumption above 10.000.000 m ³	0,21 c€/m ³

As the Energy Tax and ODE Levy are fixed in € per volume units (€/m³) and not in € per energy unit, the calorific value of the used natural gas has an impact on the total amount paid. As in the Netherlands, low caloric natural gas is used, except in around 80 industrial companies, the assumption is made that the profiles under review use low caloric natural gas.

Component 4 – VAT

A VAT of 21% is to be paid by residential consumers on the total energy invoice.¹¹⁹

¹¹⁷

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen/tarieven_milieubelastingen?projectid=6750bae7-383b-4c97-bc7a-802790bd1110

¹¹⁸https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen/tarieven_milieubelastingen?projectid=6750bae7-383b-4c97-bc7a-802790bd1110

¹¹⁹

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/btw/tarieven_en_vrijstellingen/goederen_diensten_21_btw/goederen_diensten_21_btw

5.5. United Kingdom

Suppliers in the UK often offer their clients a so-called dual fuel tariffs for the sale of electricity and natural gas combined in one product. To be consistent with the methodology we have used for the other countries, we consider natural gas only products. Tariffs of suppliers in the UK are less transparent and the tariffs are generally presented as ‘all-in tariffs’ (including commodity prices, network charges, taxes and VAT) which consist of:

- A fixed element, *Standing Charge*, expressed in p/day that covers the fixed costs of the energy supplier and is the same for any consumer in any region of the UK and;
- A variable element, *Unit Rate Charge*, expressed in p/kWh, which differs according to the region in which the supplier has contracted the consumer.

In order to retrieve the commodity element of the natural gas price for the United Kingdom, we therefore need to deduct the network charges, taxes and VAT from these ‘all-in tariffs’, just as was done for electricity¹²⁰. As commodity prices are not very different between regions and for sake of simplicity¹²¹, a median commodity price will be used for all 8 DSO regions, for which the median DSO (of the Yorkshire region) is selected through the results from an Ofgem study of 2015. The network tariffs of the Yorkshire region will be deducted from the all in tariff, together with the VAT and taxes to calculate the commodity price, while the weighted average of network tariffs for all DSOs will be used to determine the network cost.

When considering products from various suppliers, we have always taken the monthly direct debit option into account, as it seems to be often the mostly used option. Once again, most suppliers don’t publish different tariffs for domestic and small professional consumers, but tend to negotiate tariffs with small professional consumers directly. As these are not publicly available, we assume that small professional consumers pay the same ‘all-in’ tariffs as domestic consumers.

Component 1 – Commodity price

The HHI of the retail market in the United Kingdom is below 2.000 in 2017.¹²² Therefore, only four products will 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. As the standard product of the incumbent is also its cheapest product, we took the second cheapest product of the second largest supplier into account as the fourth product.¹²³

The table below presents the market shares¹²⁴ of the two largest natural gas suppliers in the United Kingdom, for which we have normalised the market shares of those suppliers for which products are taken into account (British Gas and SSE).

¹²⁰ For more information on the different components of a natural gas invoice in the United Kingdom, see

https://www.ofgem.gov.uk/system/files/docs/2017/03/supplier_cost_index_-_methodology_v1.1_0.pdf

¹²¹ According to a study of October 2015 by Ofgem, commodity prices, including taxes, range between £411 and £440 annually between the 8 DSOs. Taking the median commodity price over- or underestimates the commodity price with maximum £15 pounds. See

https://www.ofgem.gov.uk/sites/default/files/docs/2015/10/reg_charges_final_master_version_23_october_2015.pdf

¹²² However the interval is known, the exact HHI index could not be found.

<https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f>

¹²³ For a more detailed description of the methodology used for the commodity price – please see section 3.5.

¹²⁴ <https://www.ofgem.gov.uk/data-portal/electricity-supply-market-shares-company-domestic-gb>

Table 52 – Natural gas supply market shares by company (Q3 2017) for domestic consumers

Natural gas company	Market share ¹²⁵ (%)	Normalised market share (%)
British Gas	32%	74,42%
SSE	11%	25,58%
Other	57%	
Total	100%	100,00%

The weight of the cheapest option equals the annual retail switching rate, and the annual retail switching rate for natural gas is 15,9% for household consumers and 11,6% for non-household consumers in the United Kingdom.¹²⁶ For E1, as the normalised market share of the market incumbent is $(32\%/43\%) = 74,42\%$, and that of the second largest supplier $(11\%/43\%) = 25,58\%$, the product of the market incumbent thus has a weight of $(100\% - 15,90\%) * 74,72\% = 62,59\%$ and the products of the second largest supplier has thus a weight of $((100\% - 15,90\%) * 25,58\%)/2 = 10,76\%$ as is presented in the table below. The same method was used for the weights of profile G2.

Table 53 – Weights attached to the selected products for profiles G1 and G2 in the United Kingdom

Product	Weight G1	Weight G2
Standard product of the market incumbent	62,59%	65,79%
Cheapest product on the market	15,90%	11,60%
Cheapest product of the second largest market player	10,76%	11,31%
Second cheapest product of the second largest market player	10,76%	11,31%
Total	100,00%	100,00%

An overview of the products we have selected per region and their respective tariff elements are presented in the table below. The cheapest product has been selected through the price comparison website of www.uswitch.co.uk.

¹²⁵ <https://www.ofgem.gov.uk/data-portal/retail-market-indicators>

¹²⁶ <https://www.ceer.eu/documents/104400/-/-/56216063-66c8-0469-7aa0-9f321b196f9f> p. 37 for household switching rates and p.41 for non-household switching rates.

Table 54 – Selected products for profiles G1 and G2 in the United Kingdom

Supplier – Product	Standard unit charge (p/day)	Standard unit rate (p/kWh)
British Gas – Standard	24,77	3,55
Green Network Energy – Family 18 Month Fixed v14 ¹²⁷	22,03	2,62
SSE – 1 Year Fixed v14	14,10	3,54
SSE – Standard DD	14,10	3,75

Component 2 – Network costs

Transmission costs

The national transmission system in the UK (except for Northern Ireland) is operated by one single entity: National Grid Gas. The Gas Transmission Transportation Charges effective as from 1st of October 2017 are comprised of the following components:

1. *Entry Commodity Charge*: a charge per unit of natural gas transported by NTS payable for flow entering the system;
2. *Exit Commodity Charge*: charge per unit of natural gas transported by NTS payable for flow exiting the system.

National Grid Gas provides a weighted average of the entry and exit capacity tariffs in their Statement of Gas Transmission Transportation Charges.¹²⁸

Distribution costs

Given the fact that profiles G1 and G2 are connected to the distribution grid, distribution and transmission tariffs have to be paid. As stated before, the UK has eight DSOs for natural gas, amongst which four are owned by National Grid. The distribution tariff for natural gas is composed of:

1. *LDZ System Capacity Charge*, with different charge band for consumption up to 73.200 kWh (G1) and between 73.200 and 732.000 kWh (G2);
2. *LDZ System Commodity Charge*, with different charge band for consumption up to 73.200 kWh (G1) and between 73.200 and 732.000 kWh (G2);
3. *LDZ Customer Capacity Charge*, with different charge band for consumption up to 73.200 kWh (G1) and between 73.200 and 732.000 kWh (G2);
4. *LDZ Customer Fixed Charges*, only due for supply points with an annual consumption between 73.200 and 732.000 kWh per year (profile G2);
5. *Exit Capacity Charges*: this is a capacity charge that is applied to the supply point in the same manner as the LDZ System Capacity Charge. These charges are applied per exit zone on an administered peak day basis.
6. *Metering charges*. Supplier charges in the United Kingdom include metering costs. To provide greater comparability we have used the assumption that

¹²⁷ Green Network Energy is one of the suppliers belonging to the category ‘Other’ in Table 32.

¹²⁸ We have used the weighted averages published in the Gas Transmission Transportation Charges of the NGG valid as from the 1st of October 2017.

metering costs amount to 2 % of the natural gas invoice and added this to the distribution component.

For the LDZ System and Customer Capacity Charges, tariffs are in p/peak day kWh/day. In order to calculate the peak day kWh (Supply Point Capacity or SOQ) for profile E1 and E2, we have used the weighted average load factor of 31,09% across all DSOS, resulting in a SOQ (or peak day kWh) of 205 kWh for G1 and 881 kWh for G2.

We will present a weighted average of these components across four DSOs for natural gas active in the UK.

Component 3 – Taxes and levies (excluding VAT)

In the United Kingdom, the following taxes and levies are due the consumers under review:

1. Energy suppliers need to account for the cost of the **Energy Company Obligation (ECO)** scheme, which helps to reduce carbon emissions and tackle fuel poverty. The cost of the ECO scheme amounts to roughly 1,6% of the total natural gas invoice (15,89 €/year)¹²⁹.
2. For small professional consumers, no Energy Company Obligation Levy is due, but a **Climate Change Levy (CCL)** is payable on the consumption of natural gas. The standard rate for natural gas is 0,198 p/kWh (about 0,22 c€/kWh)¹³⁰.

Component 4 – VAT

VAT on consumption of natural gas in the UK amounts to 5% for residential consumers and will be presented as a different price component¹³¹.

¹²⁹ <https://www.ofgem.gov.uk/consumers/household-gas-and-electricity-guide/understand-your-gas-and-electricity-invoices>

¹³⁰ <https://www.gov.uk/government/publications/rates-and-allowances-climate-change-levy/climate-change-levy-rates>

¹³¹ <https://www.gov.uk/guidance/rates-of-vat-on-different-goods-and-services#power>

6. Presentation and interpretation of results

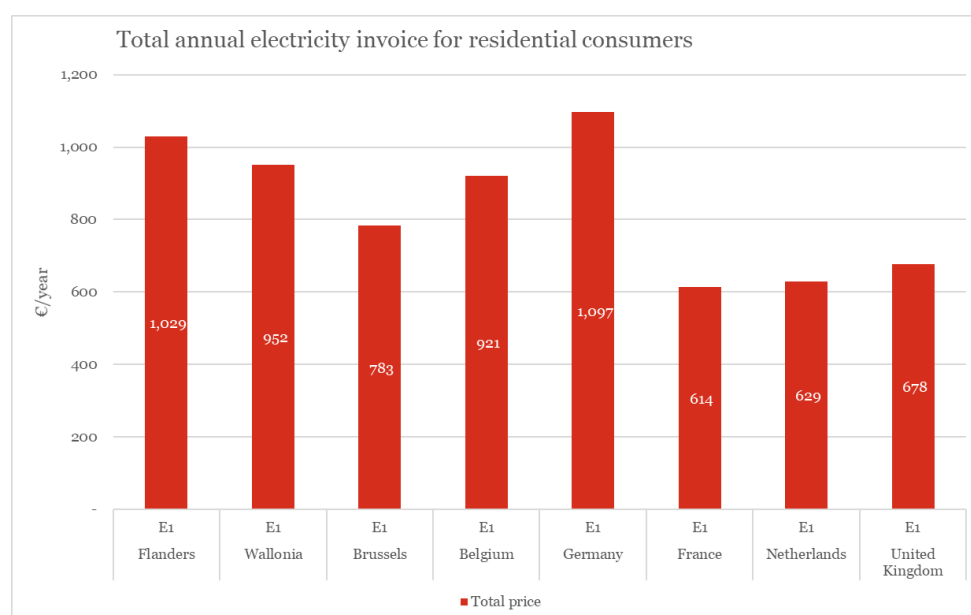
6. Presentation and interpretation of results

6.1. Profile E1 (Electricity)

Total invoice analysis

Figure 8 provides a comparison of the total annual invoices paid by a residential consumer (profile E1) in the various countries under review. Results are expressed in €/year.

Figure 8 – Total annual invoice in €/year (profile E1)

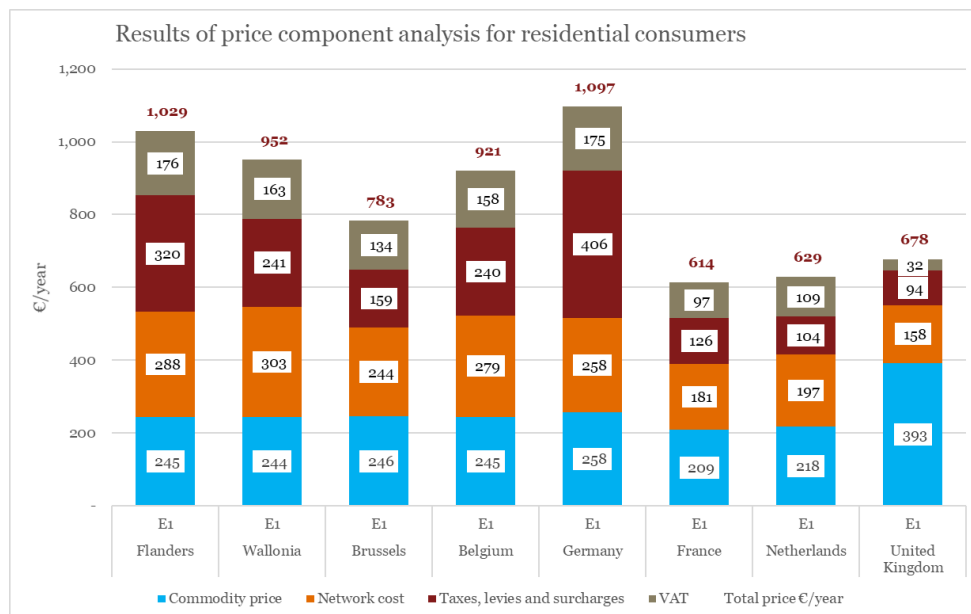


As can be seen from Figure 8, the total annual electricity invoice for E1 is the highest in Germany. This invoice is almost the double as the invoice in France. Belgium has the second highest invoice for profile E1. All Belgian regions have a lower total invoice than Germany, but a higher total invoice than France, the Netherlands and the United Kingdom. Nonetheless, there are substantial differences between the Belgian regions, with the Flemish region having the highest invoice, followed by Wallonia. The Brussels Capital Region has the lowest annual invoice in Belgium.

Breakdown by component

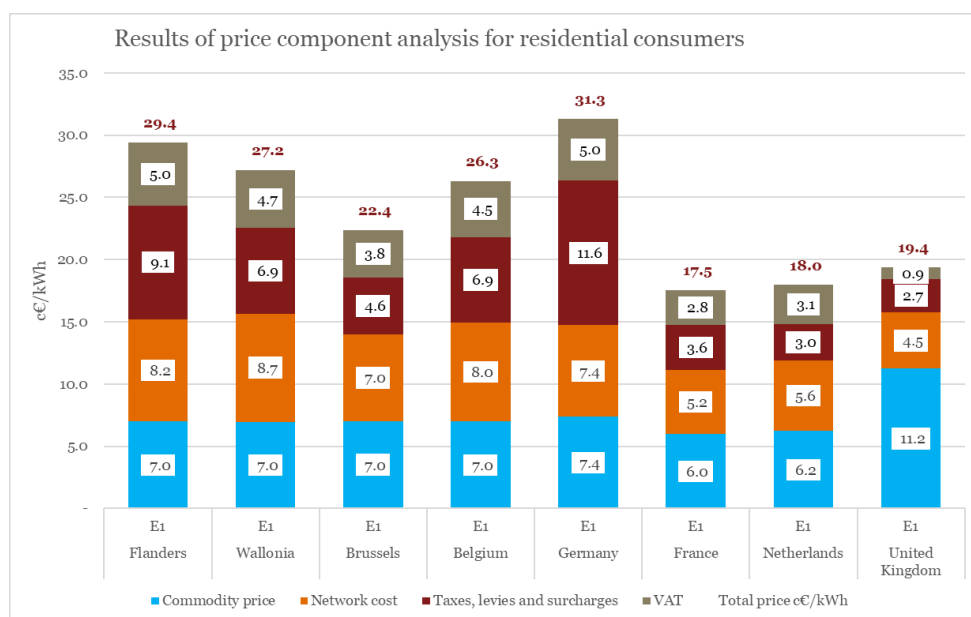
The previous results are further detailed for profile E1 in which provides a closer look at the components breakdown.

Figure 9 – Electricity price by component in €/year (profile E1)



It can be seen that the commodity component is the lowest in France, closely followed by the Netherlands. It also shows that the United Kingdom has the highest commodity price, but a relatively low total electricity price, because of the low taxes, network charges and VAT. On the other hand, Germany's high annual invoice stems from a very high third component (taxes, levies and others). Considering the differences between the Belgian regions, the main difference stems to a minor extent from the network costs but comes mainly from differences in taxes, as in Flanders the total cost of public service obligations is higher than in the other regions.

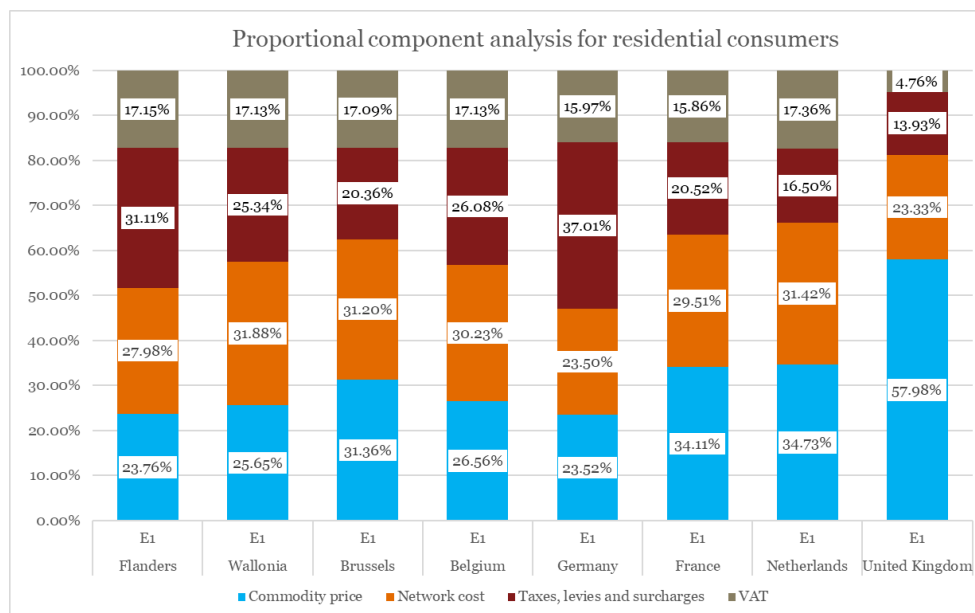
Figure 10 – Electricity price by component in c€/kWh (profile E1)



Proportional component analysis

The proportional cost for each component can be found in Figure 11.

Figure 11 – Proportional component analysis (profile E1)



In general, the commodity component is between 23,52% and 34,73% of the total invoice. The exception is the United Kingdom, where the commodity component is making up 57,98% of the total invoice. The share of the network component in the total power price is quite similar across countries, but large differences in taxes and VAT can be observed. While the VAT across continental Europe is within a similar range, the VAT in the United Kingdom is much lower. Other taxes vary widely between countries, going from 13,93% of the total invoice in the United Kingdom to 37,01% in Germany.

KEY FINDINGS

The first electricity (E1) profile suggests the following findings:

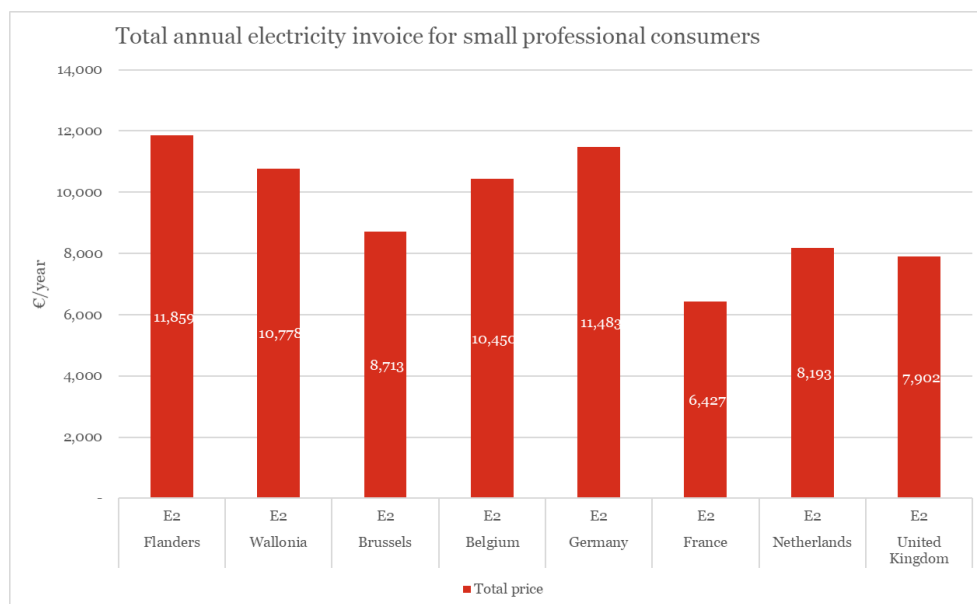
- We observe very important differences between the countries under review: a possible total invoice for profile E1 can vary between 614€ and 1.097 €/year.
- *Commodity costs* make up just a small part of the total invoice and are lowest in absolute terms in France. The commodity cost in the Netherlands is the second lowest, slightly lower than Belgium and Germany. The UK shows the highest commodity cost.
- *Network costs* usually absorb a substantial part of the total invoice. They also diverge between the different countries. They are highest in the Walloon and Flemish region, while the UK, France and the Netherlands show similar, relatively low network costs.
- *Taxes, levies and surcharges* are characterised by a large variance. They are highest in Germany, followed by the Flemish region. Residential consumers in the UK, France and the Netherlands pay considerably less taxes than those in Belgium and Germany.

6.2. Profile E2 (Electricity)

Total invoice analysis

Figure 12 provides a comparison of the total annual invoice paid by profile E2 in the various countries under review. Results are expressed in €/year.

Figure 12 – Total annual invoice in €/year (profile E2)

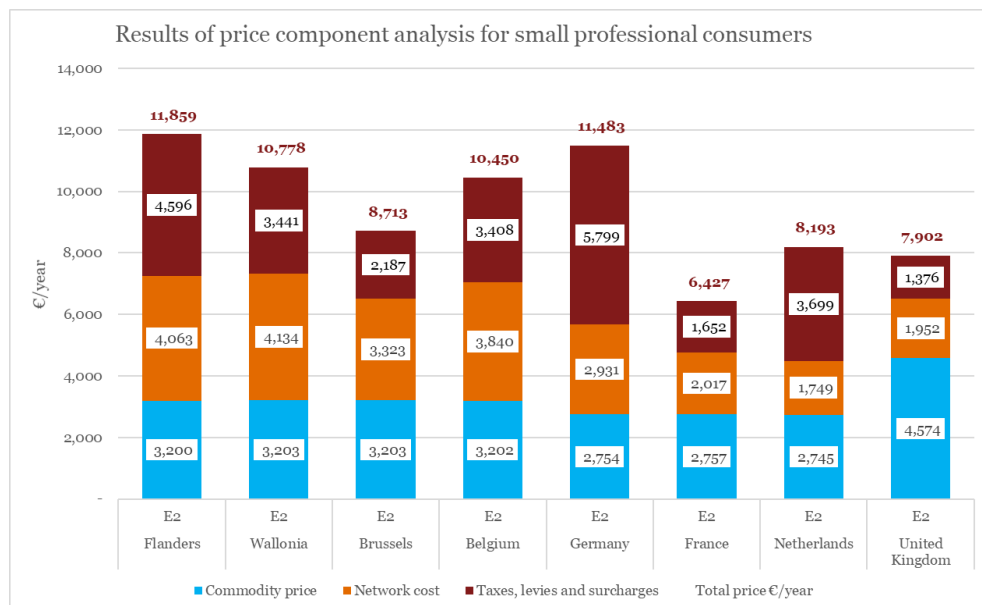


Different from the price comparison for the residential consumer, the total annual electricity invoice for small professional consumers is the highest in Flanders. This invoice is eighty percent higher than a consumer with a similar use in France. Germany has the second highest invoice for profile E2, very similar to the Flemish case. The other Belgian regions have a lower total invoice than Germany, but a higher total invoice than France, the Netherlands and the United Kingdom. We observe strong differences between the regions in Belgium, with the Flemish region having the highest invoice, followed by Wallonia. The Brussels Capital Region has the lowest annual invoice in Belgium.

Breakdown by component

The previous results are further detailed for profile E2 in Figure 13 which provides a closer look at the breakdown of the different price components.

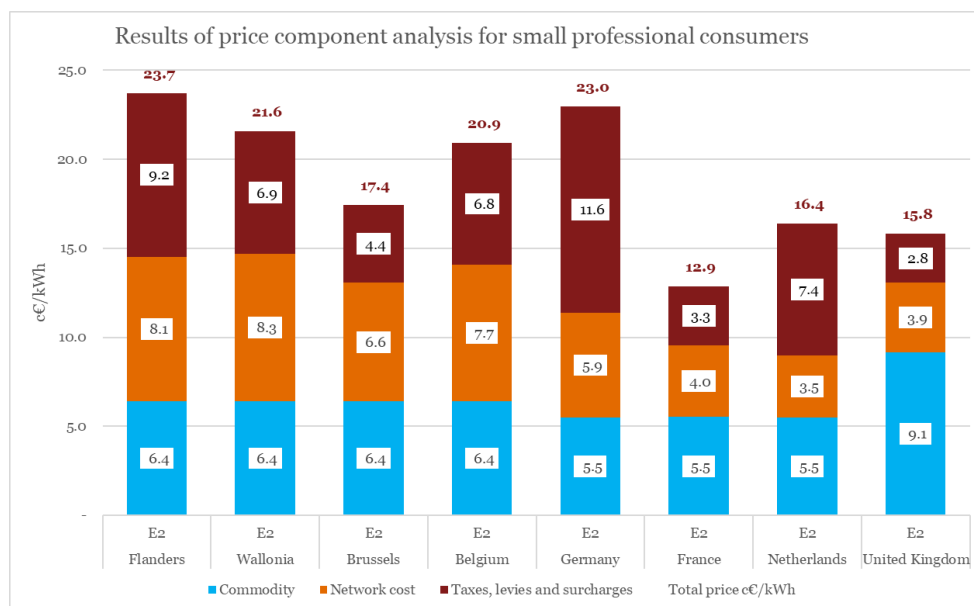
Figure 13 – Electricity price by component in €/year (profile E2)



From Figure 13, it can be seen that the commodity component for small professional consumers is relatively low in all countries on the European continent while it is substantially higher in the United Kingdom. Although it shows that small professional consumers in the UK pay the highest commodity price, they pay a relatively low total electricity price, because of low network charges, taxes and VAT.

On the other hand, Germany's high annual invoice stems from a very high tax component when comparing to the other countries. Considering the differences between the Belgian regions, the main difference stems to a minor extent from the network costs (lower in Brussels) but stems mainly from differences in the third component (taxes, levies and surcharges), due to higher public service obligations in Flanders.

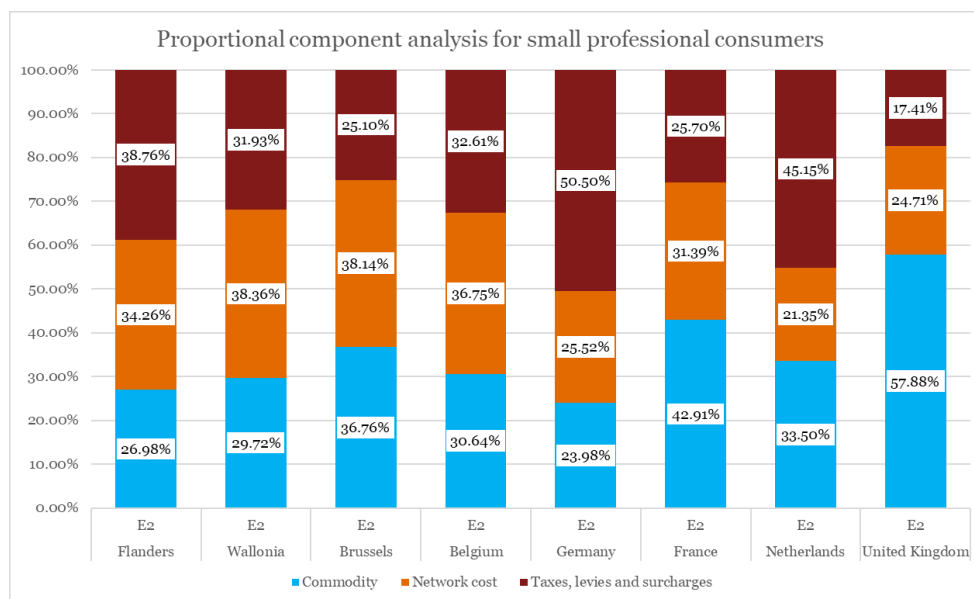
Figure 14 - Electricity price by component in c€/kWh (profile E2)



Proportional component analysis

The percentages of the costs for each component can be found below in Figure 15.

Figure 15 – Proportional component analysis (profile E2)



Large differences between the different components can be observed. In the Belgian regions, taxes and network charges make up between 63,24% and 70,02% of the total invoice, with important differences in taxes between the regions. In Germany and the Netherlands an even larger tax component is observed. On the other hand, the United Kingdom is characterised by a very large commodity component.

KEY FINDINGS

The second electricity profile (E2) suggests the following findings:

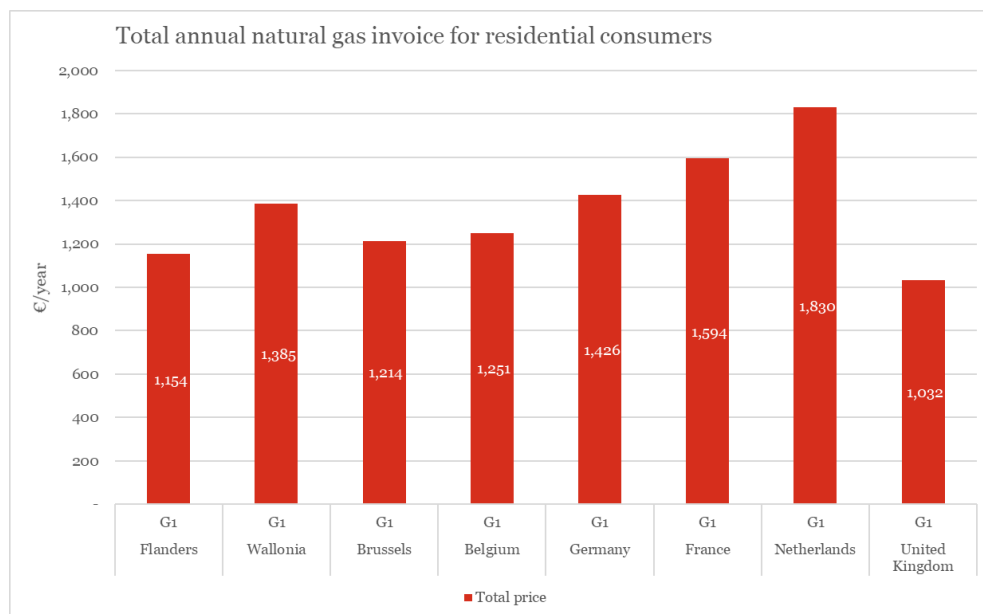
- We observe very important differences between the countries under review and even within the countries: a possible total invoice for profile E2 can vary between 6.427€ and 11.859 €/year.
- Belgium is not very well positioned compared to other countries in terms of total electricity cost, especially the Flemish and (to a lesser extent) Walloon region. France is by far the most competitive case under review.
- *Commodity costs* contribute between 23,60% and 57,88% to the total invoice. The Netherlands show the lowest commodity prices (in absolute values), while the United Kingdom deals with a considerably higher commodity price.
- *Network costs* absorb a variable but possibly substantial part of the total invoice. They also diverge between the different countries. They are the highest in Belgium and the lowest in the Netherlands.
- *Taxes, levies and surcharges* are characterised by a large variance, and are rather important in Germany, the Netherlands and Belgium, especially in the Flemish region, while they remain very low in the United Kingdom.

6.3. Profile G1 (Natural gas)

Total invoice analysis

The analysis of the two natural gas consumption profiles is carried out along the same pattern as the one used for the electricity profiles. Figure 16 depicts the total annual invoice charged to the residential consumer (G1).

Figure 16 – Total annual invoice in €/year (profile G1)

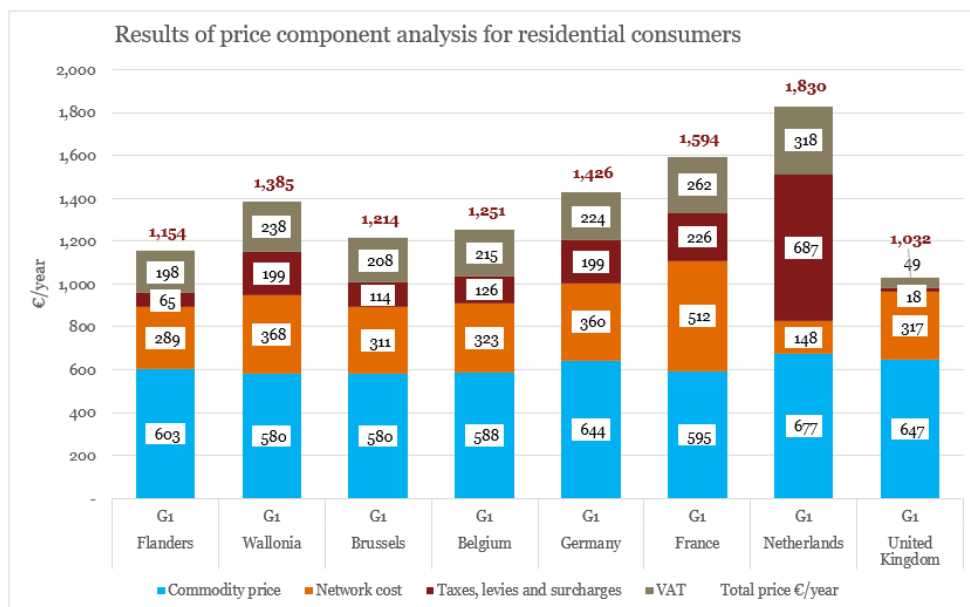


As can be seen, the total annual natural gas invoice for G1 is the highest in the Netherlands. This invoice is about eighty percent higher than the invoice in the United Kingdom. Belgium has the second lowest invoice for profile G1. All Belgian regions have a lower total invoice than Germany, France and the Netherlands. Nonetheless, there are differences between the regions, with the Flemish region having the lowest invoice, followed by the Brussels Capital Region. The Walloon region has the highest annual invoice in Belgium.

Breakdown by component

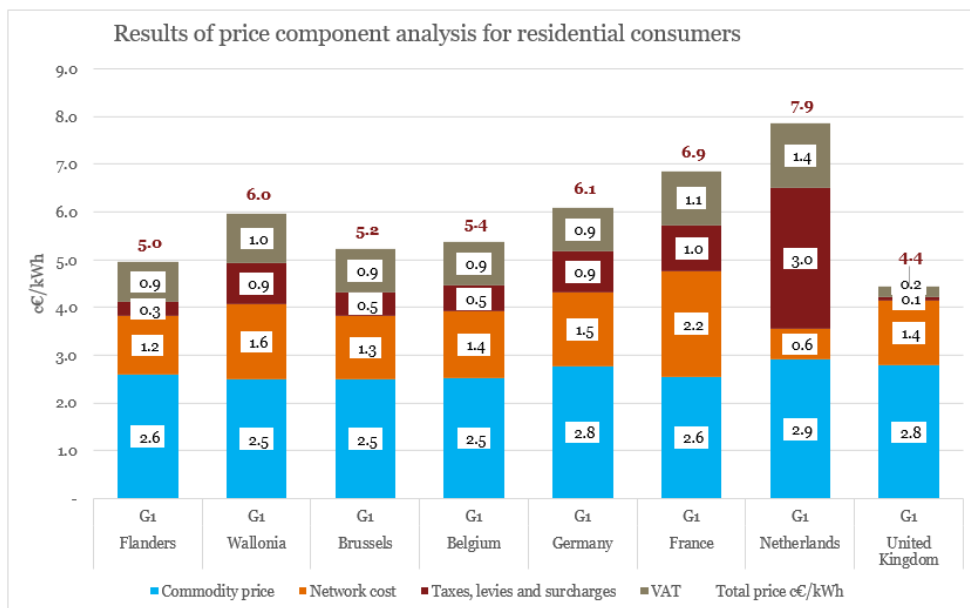
The previous results are further detailed for profile G1 in the following chart. Figure 17, which provides a closer look on the components' breakdown.

Figure 17 – Natural gas price by component in €/year (profile G1)



It can be seen that the commodity component is the lowest in Belgium. It also shows that the United Kingdom has the lowest annual invoice because of the low taxes and VAT. On the other hand, the main reason that the Netherlands have the highest annual invoice stems from the high taxes and charges. Considering the differences between the Belgian regions, the main difference stems to a minor extent from the network costs but comes mainly from differences in taxes due to the existence of the *connection fee* in Wallonia.

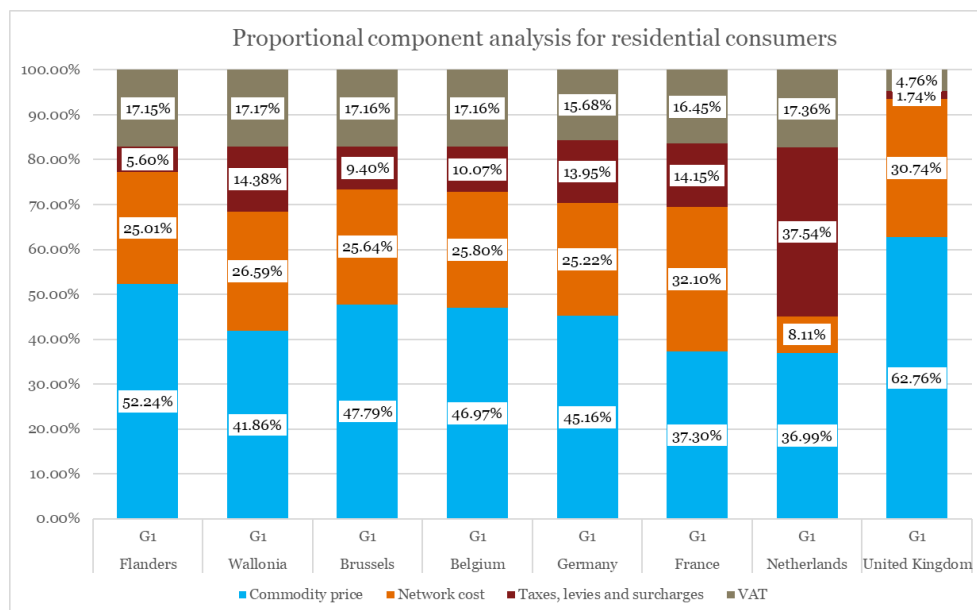
Figure 18 – Natural gas price per component in c€/kWh (profile G1)



Proportional component analysis

The percentages of the costs for each component can be found in Figure 19 below.

Figure 19 – Proportional component analysis (profile G1)



It is clear that for every country or region investigated, except the Netherlands, the commodity component is the most important component, from 36,99% in the Netherlands up to 62,76% in the United Kingdom. The second largest component in general are the network costs, which account for about 25% to 32% of the total cost in most countries, with the exception of the Netherlands, where the network costs only account for 8,11%. For the other countries, taxes range between 5% and 14% in most countries. The United Kingdom, on the other hand, has a very low proportion of taxes. The VAT is comparable in most cases, except for the United Kingdom, that has a very low VAT on natural gas.

KEY FINDINGS

Natural gas profile (G1) suggests the following findings:

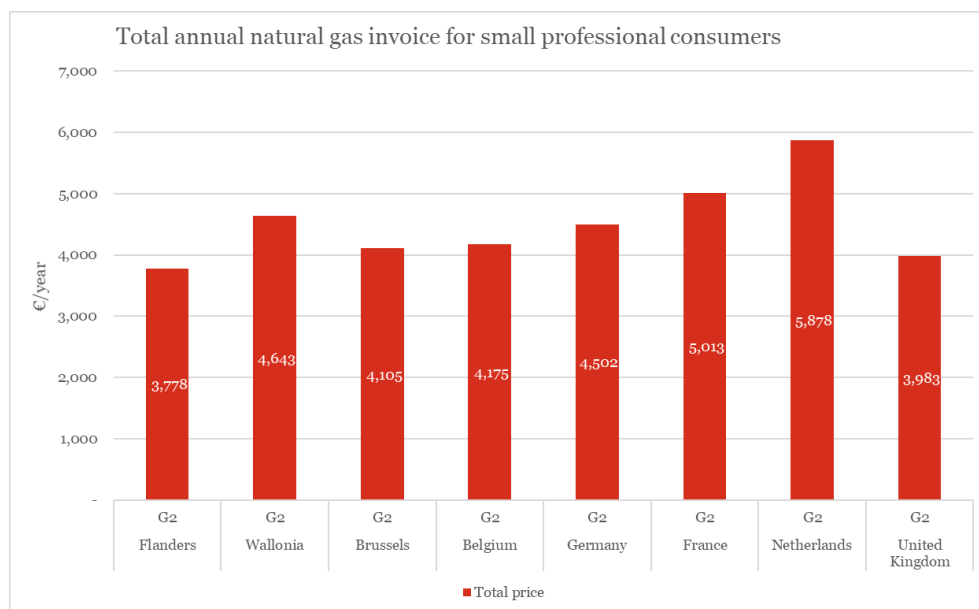
- The Netherlands have the highest annual invoice for G1, and the United Kingdom the lowest annual invoice.
- Important differences between the three Belgian regions exist. The Flemish region has the lowest annual invoice, followed by the Brussels Capital Region. The Walloon region has the highest annual invoice of the Belgian regions, mainly due to tax differences.
- *Commodity prices* are the largest factor in every country or Belgian region and are in Belgium and France roughly equal and lower than in Germany, the United Kingdom and the Netherlands. They are the highest in Netherlands.
- *Network costs* in all countries are at comparable levels, except for the Netherlands where they are considerably lower.
- *Taxes, levies and surcharges* are exceptionally high and the main driver of the high invoice in the Netherlands. Levels in other countries differ, but are generally lowest in the UK and the Flemish region.
- The low invoice of the United Kingdom is mainly caused by low taxes and VAT.

6.4. Profile G2 (Natural gas)

Total invoice analysis

The next chart, Figure 20, depicts the total annual invoice charged to the consumer characterised as a small professional consumer (G2).

Figure 20 – Total annual invoice in €/year (profile G2)

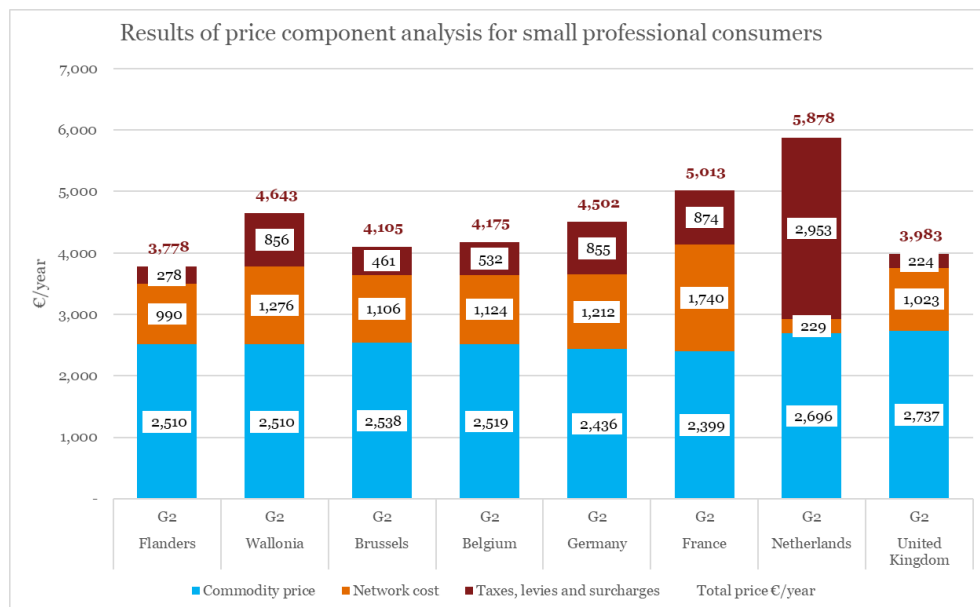


As can be seen, is the total annual natural gas invoice for G2 the highest in the Netherlands, followed by France. In Belgium, large differences between the regions exist, and the Flemish region has the lowest invoice and the Walloon region the third highest invoice of all countries and regions taken into consideration. Overall, the United Kingdom emerges as the country with the lowest invoice, although the UK invoice is higher than the invoice in the Flemish region.

Breakdown by component

The previous results are further detailed for the profile G2 in the following chart, Figure 21, which provides a closer look on the components' breakdown.

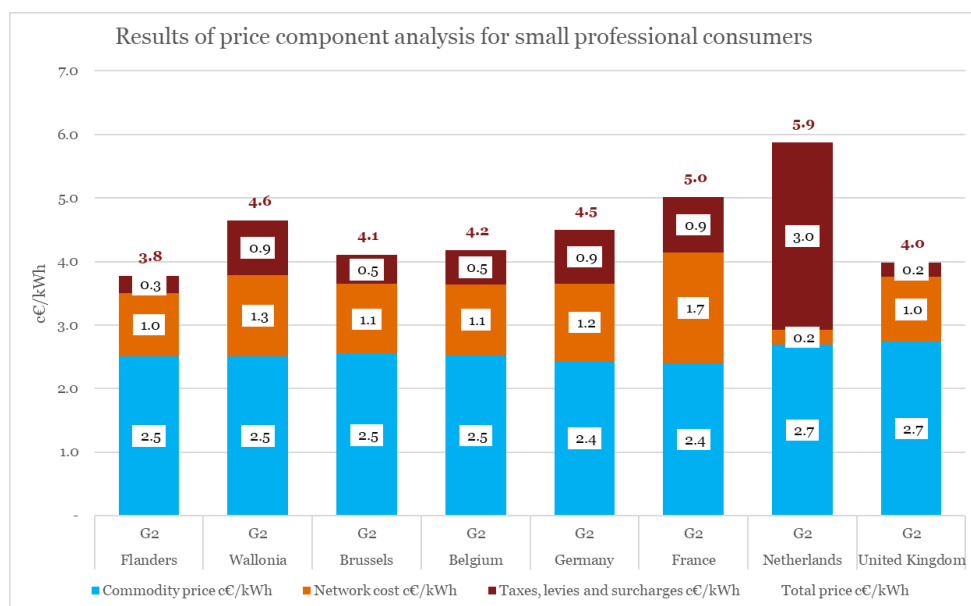
Figure 21 – Natural gas price by component in €/year (profile G2)



It can be seen that the commodity component is the lowest in France. It shows clearly that the high invoice in the Netherlands is due to high taxes. Considering network costs, the Netherlands have a much lower cost than the other countries which however does not entirely offset the tax effect. The relatively low annual invoice in the Flemish region can in part be explained by the network costs, while the main explanation of the difference with the other Belgian regions comes from the differences in taxes (with the *connection fee* impacting the Walloon tax level). Low taxes also explain why the United Kingdom have a relatively total invoice despite having a relatively high commodity cost.

The next graph details the price of every component in c€/kWh.

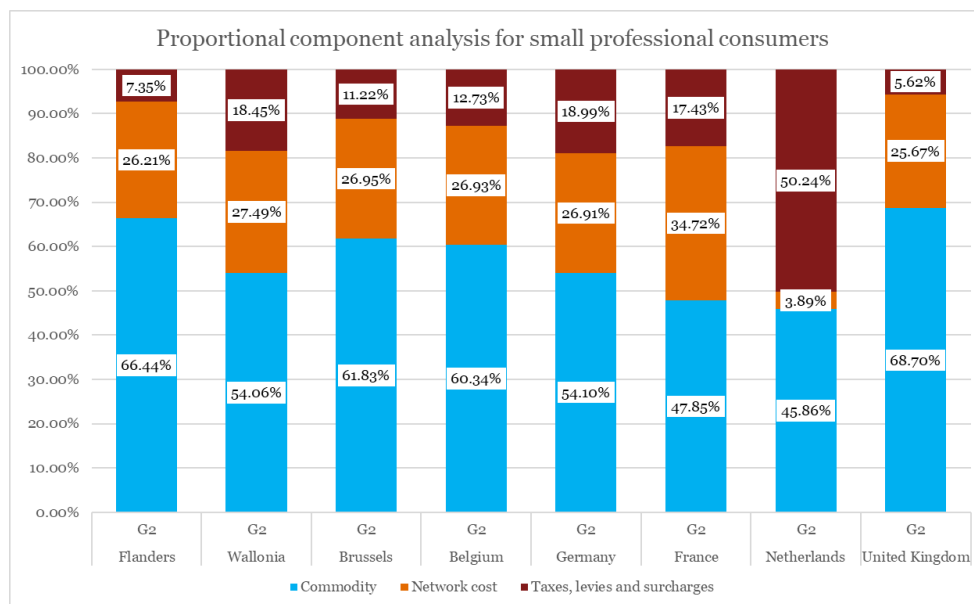
Figure 22 – Natural gas price by component in c€/kWh (profile G2)



Proportional component analysis

The percentages of the costs for each component can be found below in Figure 23:

Figure 23 – Proportional component analysis (profile G2)



It is clear that for every country or region investigated, the commodity component is the most important component, from 45,86% in the Netherlands up to 68,70% in the United Kingdom. The commodity component is generally followed by the network costs, which account for about 25% to 35% of the total cost in most countries, with the exception of the Netherlands, where the network costs only account for 3,89%. Further, taxes range from about 5,62% to 19% in most countries, with the remarkable exception of the Netherlands, where taxes make up just over 50% of the total invoice.

KEY FINDINGS

The small professional profile (G2) suggests the following findings:

- The total invoice for natural gas in Belgium is generally low. There are however relatively large differences in total invoice between the regions. The Flemish region has the lowest total annual invoice and has a lower annual invoice than all the neighbouring countries. The Walloon region on the other hand has the third highest invoice of all countries and regions investigated.
- All Belgian regions have relatively low commodity prices – only France and Germany have a (slightly) lower commodity cost. The difference between the Belgian regions is mainly due to the higher taxes in the Walloon region, and to a minor extent to the network costs.
- *The commodity component* is the main driver of the total invoice in all countries, except for the Netherlands.
- The Netherlands emerges as the country with the highest annual invoice. This is mainly because of the high taxes on natural gas. As for profile G1, the Netherlands have low network costs for profile G2.
- With the exception of the Flemish region, the United Kingdom present the lowest annual invoice of all countries under review. This is remarkable as they have a relatively high commodity cost. Yet the total invoice is the lowest due to the low taxes.

7. Energy prices: Conclusion

7. Conclusion

In general, large differences are observed in the total invoices between the countries and between the electricity and natural gas invoice, but most of the conclusions about profiles E1 and G1 are also valid for profiles E2 and G2, although the differences in total invoice between the countries are in general smaller for the professional profiles than for the residential profiles.

The main differences between the residential and small professional consumers can of course be attributed to the VAT, which is not paid by professional users. One other significant difference is that residential users can benefit of a large reduction per household on electricity taxes in the Netherlands.

In all countries but France, large differences exist in the network tariffs. The methodology of calculating weighted averages therefore loses some of the observed specificities of network costs in all countries. Yet, the methodology does lead to a representative sample, taking into account certain practical limits (especially for Germany).

7.1. Electricity

Some **general conclusions** can be drawn in terms of electricity:

1. The electricity prices for both profiles investigated are relatively high in Belgium. This is to a large extent due to high network costs as well as high taxes. The Flemish region is the most expensive region for electricity in Belgium, and this is mainly caused by higher taxes, levies and surcharges (both public service obligations on the local transport grid and the distribution grid).
2. Large differences in electricity prices exist between countries. Residential consumers in Germany almost pay double as much as residential consumers in France. Albeit smaller than for residential profiles, also small professional consumers in Germany pay more than a third more than those in France.
3. When comparing the cost per kWh, small professional users generally pay less than residential users. This is partly explained by the VAT, which is not a real cost for professional users. Moreover, for all countries, the commodity component is lower for professional users than for residential users. The network costs are also generally lower, by minor amounts in most cases but up to 2 c€/kWh in the Netherlands. Concerning taxes excluding VAT, it is remarkable that these are not lower for small professional consumers..

7.2. Natural gas

As far as natural gas is concerned, some **general conclusions** can be presented as well:

1. Commodity costs make up a very important part of the natural gas invoice, and their relative importance is higher than for electricity.
2. The natural gas prices for both profiles investigated are relatively low in Belgium. This can be explained by the low commodity component, and low taxes. There exist significant differences between the Belgian regions. The Flemish region is the least expensive region for natural gas in Belgium, followed by Brussels and Wallonia. Differences between the regions are explained by the network costs and taxes.
3. Large differences in natural gas prices exist between countries. Residential consumers in the Netherlands almost pay double as much as residential consumers in the United Kingdom. Whereas smaller than for residential

profiles, also small professional consumers in the Netherlands pay almost a third more than a similar user in the United Kingdom.

4. When comparing the costs per kWh, small professional users generally pay less than residential users. This is partly explained by the VAT, which is not a real cost for professional users. Moreover, for all countries, the commodity component is lower for professional users than for residential users, although the differences are smaller than for electricity. The network costs are also generally lower per kWh for small professional consumers. The taxes excluding VAT are in the same order for both profiles.

7.3. Electricity and natural gas compared

To conclude, one can observe that countries and regions with low electricity costs do not always have a low natural gas cost as well.

In Belgium for instance, the Flemish region is the most expensive region concerning electricity, followed by Wallonia and Brussels. Yet for natural gas, the Flemish region is the least expensive region, followed by Brussels and Wallonia.

This is also the case for some neighbouring countries. The Netherlands have a low electricity invoice for profile E1, and a relatively low electricity invoice for profile E2. Yet, it is the country with the highest natural gas invoice. Also in France low invoices for electricity but high invoices for natural gas are observed. Germany has the highest invoice for electricity for profile E1 and is only modestly lower for profile E2. For natural gas, on the other hand it has a rather low invoice for both profiles.

The United Kingdom is the only country that does not follow this tendency; it presents the lowest invoices for natural gas for both profiles under review, but is equally and has low invoices for electricity too.