Benchmarking study of electricity prices between Belgium and neighbouring countries
# Table of contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>1</td>
</tr>
<tr>
<td>Executive summary</td>
<td>2</td>
</tr>
<tr>
<td><strong>About this study</strong></td>
<td>8</td>
</tr>
<tr>
<td>Methodology</td>
<td>8</td>
</tr>
<tr>
<td>General overview</td>
<td>8</td>
</tr>
<tr>
<td>Specific benchmarking assumptions</td>
<td>9</td>
</tr>
<tr>
<td><strong>Detailed findings</strong></td>
<td>12</td>
</tr>
<tr>
<td>Total electricity prices</td>
<td>12</td>
</tr>
<tr>
<td>Market prices</td>
<td>18</td>
</tr>
<tr>
<td>Network costs</td>
<td>20</td>
</tr>
<tr>
<td>Electricity taxes</td>
<td>24</td>
</tr>
<tr>
<td><strong>Deloitte Belgium Contacts</strong></td>
<td>32</td>
</tr>
</tbody>
</table>
For energy-intensive companies, energy costs are representing an important (if not a major) part of their total (variable) production costs. Energy costs, such as gas and electricity are therefore critical cost components that need to be managed carefully as they have a decisive impact on the competitiveness and viability of such companies in the global markets in which they are competing.

In this context and in order to assess the existence of a level playing field for electricity prices, the Federation of Belgian Industrial Energy Consumers (hereafter “Febeliec”) commissioned Deloitte to perform a benchmarking study. The study provides objective comparative information on prices for purchased electricity available to Belgian industrial consumers compared to their peers in the surrounding countries (France, Germany and the Netherlands).
Objectives, scope and methodology
The primary objective of the study that Febeliec commissioned at Deloitte is to obtain an overview of possible differences in prices for electricity purchased on the electricity market by major industrial consumers such as the members of Febeliec in Belgium as compared to their peers in France, The Netherlands and Germany.

The primary focus is on relative price differences that exist on the market for Febeliec member profiles using identical, simplified, standardized, load (base load and peak load) and volume profiles (ranging from 100 GWh to 1,000 GWh). The study covers the actual prices for electricity that can be purchased in the relevant electricity markets in the period 2011, 2012 and 2013 based on existing legislation and policies. Besides the commodity price, the total electricity price also includes the network costs and the applicable taxes. This study is entirely based on verifiable information that is publically available and which has been carefully validated and corroborated with information received from Febeliec and its members.

Results
Large industrial base load consumers in Flanders and Wallonia are facing on average between 12 % (for a 1,000 GWh profile in Flanders) and 45% (for a 100 GWh profile in Wallonia) higher prices for purchased electricity versus average prices in our neighbouring countries. These differences essentially result from a combination of governmental measures in our neighbouring countries (reductions and exemptions) in favor of industrial consumers such as lower regulated market prices (in France), network costs (in Germany) and electricity taxes (in The Nederlands and France). Electricity taxes in Flanders are relatively high and this is even more the case for Wallonia.

This study shows a price difference for industrial base load consumers of approximately 6,5 EUR/MWh (for 1000 GWh consumers in Flanders in 2013) to 25 EUR/MWh (for 100 GWh consumers in Wallonia 2013) compared to the average of the neighbouring countries. For a 100 GWh base load industrial consumer this represents a difference of 1 million Euro per year in Flanders and even 2,5 million Euro per year in Wallonia per industrial consumer. For a 1,000 GWh base load industrial consumer this disadvantage is 6,4 million Euro in Flanders and 6,9 million Euro in Wallonia.

How this difference impacts the competitiveness of our industrial electricity consumers is not part of the scope of this study.
Benchmarking study of electricity prices between Belgium and neighboring countries

Figure 2: Total electricity prices - 2013 - Base load profiles

Figure 7: Total electricity prices - 2013 - Peak load profiles
Total difference in electricity cost for Belgian industrial electricity consumers as compared to neighbouring countries - 2013 - Base load profiles

Total difference in electricity cost for Belgian industrial electricity consumers as compared to neighbouring countries - 2013 - Peak load profiles
Market prices
Market prices for electricity are not diverging significantly, except in France, where industrial base load consumers have access to electricity at lower prices regulated by the government. This results in a difference of around 0.8 Mio EUR for a 100 GWh and 7.6 Mio EUR for a 1,000 GWh base load profile industrial consumer when compared with their peers in France.

Electricity market price for base load profiles

![Electricity market price for base load profiles](image-url)
Network costs
Most industrial consumers are exempted from network costs in Germany which reduces their electricity prices as compared to their peers in neighbouring countries.

The French network costs are exceeding the Belgian and Dutch network costs. However the impact of the price difference resulting from French companies paying higher network costs is significantly smaller than the impact of price difference resulting from the lower regulated market prices for electricity.

Network cost - 2013 - Base load profiles

Figure 16
Electricity Taxes
In Belgium, industrial electricity consumers are facing higher electricity taxes as compared to their peers in France, Germany and the Netherlands as a result of certain exemptions, discounts and/or capping mechanisms applied in regulations in such countries.

The service obligation tax which is applicable in Wallonia since 2012 for the medium-high voltage network consumers, results in a substantial difference for industrial electricity consumers (in the range of 100 GWh to 300 GWh) in Wallonia.

Figure 23
Methodology
The selected methodology aims to provide a high level insight into price levels for purchased electricity for similar industrial activities in Belgium versus its neighbouring countries.

As electricity prices in Belgium are characterised by important regional differences due to a number of regional taxes and levies in addition to the federal ones, the results of the benchmark study are reported separately for Flanders and Wallonia rather than presenting average results for Belgium as a whole.

General overview
The benchmark study covers the comparison of the electricity prices for 2011, 2012 and 2013 taking into account all significant components such as the market price, taxes and network costs.

Market price
In order to obtain comparable commodity price data over the different members of Febeliec, the market price is based on the electricity market quotations (using appropriate combinations of spot and forward prices) applied to a number of selected standard benchmark profiles. The study focuses on pricing levels available in each country for electricity that is purchased and delivered at the industrial site of such benchmark profiles in the respective countries.

Electricity taxes and network costs
Electricity taxes and network costs applied to the selected standard benchmark profiles are derived from public data sources, and corroborated with data obtained from Febeliec and its members having activities in the jurisdictions in scope. By electricity taxes, we mean all taxes and other levies that are to be paid by industrial electricity consumers on top of the market price and network costs.

Network costs are regulated tariffs applied by the transmission grid operators (TSO’s) for the transport of electricity over the transmission network (excluding distribution).

This pricing approach is selected, validated and approved by Febeliec, in order to:

• Neutralize the impact of different sourcing and hedging strategies applied by the respective Febeliec members (which are only relevant for the individual business models of such members)
• Neutralize the impact of historical long term sourcing contracts concluded under different market conditions (and which are not relevant for the objective of the study).
• Identify the impact on the market price that result from the market conditions for purchased electricity (including the level or lack of integration of the different electricity markets in the scope of the study).

3 Brussels is not withhold as a separate region due to the absence of major industrial consumers in the Brussels region.
Specific benchmarking assumptions

In order to compare the electricity prices between the different countries, two standard profiles have been defined, validated and approved by Febeliec for use in this study:

- The base load profile, which features a flat, constant consumption throughout the day and year.
- The peak load profile, which has no consumption at all outside the peak hours and a flat, constant consumption during the peak hours (8h to 20h).

The benchmark study covers the base load and peak load profiles for a yearly consumption between 100 GWh and 1000 GWh.

For all countries except for France, the commodity costs are determined taking into account market prices for electricity based on spot and forward quotes. A representative market price is based on a weighted average of the year-ahead (50%), month-ahead (35%) and day-ahead market prices (15%). For 2013 the commodity prices are only based on the year-ahead prices of 2012 (Cal 2013) due to the forward looking character of this element.

The market prices that are used consist of an average of the daily closing prices for spot and forward quotes as published by:

- APX (spot prices) ENDEX (forward prices) for the Netherlands
- BELPEX (spot prices) and ENDEX (forward prices) for Belgium
- Powernext (spot prices) and EEX (forward prices) for France
- EPEX (spot prices) and EEX (forward prices) for Germany

As no peak load future prices are available for delivery on the Belgian Market, Peak load prices are determined as the average of future prices for delivery on the Dutch and French market.

Market prices in France are taking into account both spot prices and the regulated rate. In France, local industrial consumers can benefit from a tariff regulated by the French government for a part of the total consumption. As the volume of electricity that can be sourced at regulated rates is capped at the consumption during French off-peak periods such that in practice the regulated tariff covers nearly all needs for a base load client (i.e. 95% in our base load profile) while the share of ARENH power for peak load consumers is rather limited (in practice only the consumption of July and August). This is reflected in our peak load profile where 15% of the electricity market price consists of the regulated price (i.e. 42 EUR/MWh in 2012 and 2013) while the remaining 85% consists of a weighted average of spot and forward market prices.

The network costs are based on the tariffs published by the transport system operators (TSO’s) and the regulators. The initial connection cost is not included as a cost element in this study due to the fact that these costs are largely determined by technical design of the connection and the required equipment.

The following elements have been assumed for the calculation of the network tariffs (as approved by Febeliec):

- Distribution costs are not included as it is assumed that all industrial consumers in scope of the benchmark are directly connected to the transmission network.
- The assumed voltage of the connection point is as follows:
  - for consumption profiles up to 200 GWh we assumed a voltage connection between 30 kVolt and 70 kVolt;
  - for consumption profiles in excess of 200 GWh we assumed an extra high voltage connection of 150 kVolt and up;
- The subscribed capacity of the connection point was determined by adding a 10% contingency to the theoretical peak power levels;
- The total energy taken off the grid on a yearly basis.

4 In application of NOMER and ARENH legislation
In all countries except for Belgium the costs for grid losses are included in the TSO tariffs. In Belgium the energy suppliers are accountable for providing the electricity that is lost on the transport system. The energy suppliers pass the cost for this additional energy on to their clients. To be consistent with our surrounding countries and to ensure comparability, we have integrated the equivalent of the commodity price of 1% of the consumption in the network costs for Belgium although it is in practice part of the commodity invoice.

As network costs in France are not yet available for the period beyond July 31 2013 these have been estimated based on actual 2013 tariffs and their evolution of the previous years.

For Germany an average grid cost has been calculated based on all 4 TSO’s that are active on the German market i.e. Amprion, 50hertz, Tenet TSO and Transnet BW. In practice however it is to be highlighted that the average network costs conceals substantial differences between the rates applied by the 4 TSO’s whereby the rates of the western TSO’s are substantially lower than the rates of the 50 Hertz network.

In practice this only impacts the network costs of the synthetic peak load profiles as German companies are exempted from network costs in case their annual consumption exceeds 10GWh and the annual utilization time is at least 7000h per year (i.e. in practice for base load profiles).

Unlike the commodity and network costs, the electricity taxes are different for Flanders and Wallonia and we therefore presented them separately in the benchmark study. Electricity Taxes relate to all taxes and other levies that are to be paid by the industrial electricity consumer in addition to market price and network costs.

As Value added tax (VAT) is reimbursable for most industrial consumers it is not considered as a cost element in this study.

In Belgium, additional taxes on green certificates are calculated on basis of total electricity consumed and part of green energy. Penalties are invoiced by suppliers to consumers. The percentage of penalties is negotiated by both parties. We took as assumption a percentage of 85%.

Finally we assumed that the defined standard load profiles benefit from existing tax exemptions and reductions and they therefore comply with the criteria for energy intensiveness and energy efficiency measures in the different jurisdictions.
This study is entirely based on verifiable information that is publically available and which has been carefully validated and corroborated with information received from Febeliec and its members.
Total electricity prices

Base load profile
As illustrated in figure 2 and figure 3 above large industrial base load consumers are facing higher prices for electricity purchased in Belgium versus in its neighbouring countries.

We currently observe prices (market price + taxes + network costs) for 2013 ranging from 48 EUR/MWh (in France) to 66 EUR/MWh (in Flanders) up to 81 EUR/MWh (in Wallonia).

Total electricity prices for industrial base load consumers are between 12% (for 1000 GWh in Flanders) and 45% (for 100 GWh in Wallonia) higher in Flanders and Wallonia compared to the average of the electricity prices in the neighbouring countries (France, Germany and the Netherlands).

Results show a difference in electricity price of approximately 6.5 to 10 EUR/MWh for industrial consumers in Flanders and of 7 to 25 EUR/MWh in Wallonia (compared to the average of the electricity prices in the surrounding countries).
For a 100 GWh base load consumer this represents a electricity costs difference of 1 MEUR in Flanders and 2,5 MEUR in Wallonia compared to the average electricity prices in the neighbouring countries.

Total electricity prices for base load profiles (100 GWh)

![Figure 4](image)

For a 1000 GWh base load consumer this represents a electricity costs difference of 6,4 MEUR in Flanders and 6,9 MEUR in Wallonia compared to the average electricity prices in the neighbouring countries.

Total electricity prices for base load profiles (1000 GWh)

![Figure 5](image)
The electricity price difference for industrial consumers in Flanders has decreased in 2012 especially for the largest base load industrial consumers following a change in legislation but a price difference still remains for such industrial consumers in Flanders as compared to The Netherlands, France and Germany.

In Wallonia total electricity prices for connections with the high voltage network (as of 150 kVolt) are comparable with those in Flanders (since the changes in the relating legislation in Flanders in 2012).

For industrial consumers with connection on the medium high voltage network (until 70 kV) however additional electricity taxes (service obligations) are due for an amount of 14 EUR/MWh which results in a significant increase of the total electricity price in the Walloon region for such profiles, creating a significantly higher electricity prices for industrial energy consumers connected to the medium voltage network (until 70 kVolt) in this region as compared to their peers in the surrounding countries.

The price differences versus electricity prices in Flanders and Wallonia for industrial consumers are essentially driven by a combination of the following governmental measures in favour of industrial base load consumers:

- Exemption from network costs in Germany
- Low electricity taxes in The Netherlands
- Low electricity taxes in France for consumers with highest volumes
- Low regulated market prices in France
Peak load profile

We currently observe prices (market price + taxes + network costs) ranging from 68 EUR/MWh (in the Netherlands) to 97 EUR/MWh (in Wallonia).

Total electricity prices for industrial base load consumers are up to 24% (for 100 GWh) higher in Wallonia compared to the average electricity prices in the neighbouring countries. Electricity prices for peak load industrial consumers in Flanders are close to the average of the neighbouring countries except for the industrial consumers with consumptions from 100 to 400 GWh where the total electricity prices in Flanders are some 5% above the average prices of the surrounding countries.

Results show a price difference of approximately 1,5 to 19 EUR/MWh for industrial consumers in Wallonia (compared to the average of the surrounding countries).
For a 100 GWh industrial peak load consumer this represents a difference in electricity cost of 1.9 MEUR per year compared to the average electricity prices in the neighbouring countries.

For a 200 GWh industrial peak load consumer this represents a difference in electricity cost of 3.4 MEUR per year compared to the average electricity prices in the neighbouring countries.
The evolution of network costs and electricity taxes over the period under review for the selected peak load profile is similar as for the base load profile consumers except for Germany where the peak load profiles are not exempted from network costs.

Also for Peak load profiles, industrial electricity consumers in Flanders and Wallonia are confronted with a higher electricity prices for all consumption levels and in Wallonia especially for the consumption levels ranging from 100 to 300 GWh.

**Total difference in electricity cost for Belgian industrial electricity consumers as compared to neighbouring countries - 2013 - Peak load profiles**
Market prices

Base load profile

In France, local industrial base load consumers have access to electricity at lower prices regulated by government. The electricity prices for base load industrial consumers evolved from 40 EUR/MWh in 2011 to 42 EUR/MWh in 2012 and 2013. In our analysis an increase of 0.5 EUR/MWh is added as margin for the supplier.

The difference in electricity cost resulting from the regulated market prices available to French base load profile consumers is approximately 0.8 MEUR per year for a 100 GWh consumer and 7.6 MEUR per year for a 1000 GWh profile consumer.

Otherwise market prices in Belgium, Germany and The Netherlands are not on average diverging significantly.

\[ \text{Figure 12} \]

\[ \text{Figure 13} \]

3 Increased with a margin of 0.5 EUR/MWh in the benchmark study representing an average margin for the power supplier
Peak load profile

Peak load market prices are lower in France and Germany compared to neighboring countries (approx. 2 EUR/ MWh or 2.5% versus the average of the surrounding countries). The price evolution from 2011 to 2013 is however similar in the jurisdictions under review.
Network costs

Base load profile
As shown in figure 16, substantial differences exist for network costs for the countries under consideration ranging between zero (Germany) and approximately 8 EUR/MWh in France (for a consumption of 100 GWh).

Network costs are identical in Flanders and Wallonia, and are comparable to the tariffs in the Netherlands. Tariffs in the Netherlands (compared to Belgium) are slightly higher for the lower range of the considered consumption profiles and slightly lower for higher range. The network costs in France are considerably higher but such higher network costs do not compensate for the effect of the lower market prices available in France for base load profiles.
Peak load profile
Contrary to base load profiles, peak load consumers are not exempt from German network costs. Network costs in Belgium are significantly lower than in the average of our surrounding countries.

On average network costs for peak load consumer profiles are higher than for base load profiles with comparable yearly consumption volumes due to the fact that the same volumes are consumed during less hours (only peak hours) resulting in a higher subscribed capacity for peak load profiles and subsequently higher capacity charges. Regardless, network costs for peak load industrial consumers in Belgium are also lower than the average of our surrounding countries.
Network cost for peak load profiles (100 GWh)

Figure 22
**Electricity taxes**

Electricity taxes are taxes and other levies that are to be borne by consumers but which are not essential for the delivery of electricity and network services. These costs are merely to be paid as a result of an issued law or other regulation.

**Base load profile**

As illustrated in figures 24 and figure 25 industrial activities in Flanders and Wallonia are paying higher taxes compared to France, Germany and the Netherlands. This is essentially due to exemptions or reductions applied in these countries for energy intensive industrial activities.

Additionally, a new tax has been introduced in Wallonia in 2012, the so called “mesure de soutien SER” which is part of the Service Obligations taxes. Due to this new tax, the Service Obligations increased from 23ctEUR/MWh in 2011 to over 14€/MWh in 2013. These Service Obligations are only due on the medium high voltage network (36kV – 70kV) and not on the Extra High Voltage network (150kV and up).

The evolution of the electricity taxes since 2011 in Flanders and Wallonia is largely opposite. While taxes in Flanders are lower in 2013 compared to 2011, they have substantially increased in Wallonia over that time period.

In France, Germany and The Netherlands, the global level of taxes is more stable and has only slightly increased over the period 2011 – 2012 – 2013. The different electricity tax components are analyzed in further detail below for each of considered jurisdiction.

The historical evolution of the electricity taxes for the different components in the different countries is summarized in figure 27 and figure 28.
Electricity taxes for base load profiles (100 GWh)

Electricity taxes for base load profiles (1000 GWh)
Detailed electricity taxes for base load profiles (100 GWh)

Figure 27

Detailed electricity taxes for base load profiles (1000 GWh)

Figure 28
Peak load profile
Most taxes only depend on the total (yearly) energy consumptions. Subsequently no material difference exists between taxes for base load and peak load profiles. Only a slight difference is observed when comparing figure 29 and figure 30 to figure 23 and figure 24. In fact only the French electricity taxes (the CTA contribution) differs between both profile types (as it is function of the network costs which in turn depends in the subscribed capacity). This means that the conclusions described for the base load profile also apply for the peak load profile.

The historical evolution of the electricity taxes for the different components in the different countries is summarized in figure 32.

![Electricity taxes - 2013 - Peak load profiles](image)

![Relative deviation of electricity taxes versus the average taxes in neighbouring countries - 2013 - Peak load profiles](image)
Electricity taxes for peak load profiles (100 GWh)

Figure 31
Figure 32

Detailed electricity taxes for peak load profiles (100 GWh)
Components of the electricity taxes for each considered jurisdiction

**Flanders**
The electricity taxes in Flanders consist of the following federal and regional taxes and levies:
- The federal contribution which raised money to:
  - Cover the costs related to the CREG (Belgian regulator for energy market)
  - Fund the decommissioning of the Mol-Dessel nuclear site
  - Support policies to reduce greenhouse gases in line with Kyoto
  - Public service obligations related to energy deliveries to financially vulnerable consumers
  - Fund a heating premium for an allowance to eligible consumers
- Federal offshore wind contribution
- Regional contribution to purchase Green (GSC) and cogen (WKK) certificates at guaranteed minimum prices
- Regional public service contributions (these contributions are not due for sites connected to the extra high voltage level (150kV and up))

**Wallonia**
The electricity taxes in Wallonia consist of the following federal and regional taxes and levies:
- The federal contribution which raised money to:
  - Cover the costs related to the CREG (Belgian regulator for energy market)
  - Fund the decommissioning of the Mol-Dessel nuclear site
  - Support policies to reduce greenhouse gases in line with Kyoto
  - Public service obligations related to energy deliveries to financially vulnerable consumers
  - Fund a heating premium for an allowance to eligible consumers
- Federal offshore wind contribution
- Regional contribution to purchase Green certificates (CV)
- Regional contribution to connect to the transport system (Redevance de raccordement au réseau)
- Regional public service contributions (these contributions are not due for sites connected to the extra high voltage level (150kV and up))

**France**
The electricity taxes in France consist of the following taxes and levies:
- CTA: the “Contribution Tarifaire d’Acheminement”
  This contribution depends on the network costs. As the network costs depend on the type of profile, this contribution is different for Base load and Peak load profiles. It is the only component of the Surplus costs that depends on the type of profile.
- CSPE: the “Contribution au Service Public de l’Electricité” has to cover the costs of the public service assignments (development of renewable power generation, of the social electricity tariffs and of the nationwide equalization of electricity tariffs)
- TCFE: the “Taxe sur la consommation finale d’électricité” replaced the different local taxes that existed before.
Germany
The electricity taxes in Germany consist of the following federal and regional taxes and levies:
• Stromsteuer: general tax on energy consumption
• Konzessionablage to refund local authorities for building or operating largely on or under public roads
• EEG-Umlage intends to increase the market penetration of electricity produced from renewable energy, according to the Renewable Energy Act
• KWK-Umlage intends to promote electricity produced from combined heat and power (CHP) plants, according to the Combined Heat and Power Act
• StromNEV-Umlage: electricity grid charges
• Offshore-Haftungsumlage finances the costs relating to Germany’s shift from nuclear to green energies

The Netherlands
The electricity taxes in the Netherlands consist of the following taxes and levies:
• The Regulerende Energie Belasting (REB) is a tax which intends to improve the rational use of energy
• The ODE tax (Wet Opslag Duurzame Energie) is a tax to finance the support for the production of renewable energy
Deloitte Belgium Contacts

For more information, please contact:

Gert Vanhees
Partner – Energy, Infrastructure & Utilities leader
+32 2 600 60 00

Authors

Raf Bervoets
Director – Energy, Infrastructure & Utilities

Günther Croisau
Manager – Energy, Infrastructure & Utilities