

# THE INFLUENCE OF PUBLIC SERVICE OBLIGATIONS ON DISTRIBUTION NETWORK TARIFFS

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## ABSTRACT

This paper investigates the influence of public service obligations on the distribution network tariffs, taking Belgium and in particular the Flemish region as a case study. Electricity tariffs in Belgium are among the highest in Europe and network charges represent a substantial part of them. Within the distribution network tariffs, a distinction can be made between exploitation costs and public service obligations. It is demonstrated that the costs of the latter have increased significantly in recent years, occupying an increasing part of the distribution system operators' budgets. This paper illustrates that implementing public service obligations the way it has been done in Flanders leads to significant differences in distribution network tariffs, only due to differences in DSO's estimations of the required costs. Comparing the Flemish situation to the rest of Europe, it becomes clear that not only there are a lot of public service obligations in Belgium, but also that they are not always imposed on the most appropriate market player.

## KEY WORDS

Energy Pricing, Regulation, Public Service Obligations, Distribution Network Tariffs

## 1. INTRODUCTION

CUSTOMERS, encouraged by authorities, expected that liberalisation would cause electricity prices to decline. More than one year after the liberalisation was completed in Belgium reality turns out to be different. According to the Belgian consumer federation Test-Aankoop electricity prices even increased for consumers using more than 3.500 kWh per annum, compared to 1999 [1]. It has to be noted that Test-Aankoop came to this conclusion using the most courant tariff, which is the standard tariff of Electrabel, applicable to almost 89 % of the households in Flanders. The Flemish regulator VREG

responded to this critique, stating prices have declined since the liberalisation for consumers who made an active choice of supplier [2]. The tariffs of those suppliers who recently entered the market are significantly lower than those of the standard suppliers. Consequently, active consumers are necessary in order to benefit lower prices. Meanwhile, also the VREG acknowledges that households still assigned to the standard suppliers, who have not signed a contract so far, pay a higher price nowadays than before the liberalisation of July 1<sup>st</sup> 2003. Since on December 1<sup>st</sup> 2004 only 37,83 % of the Flemish households had signed a contract with their electricity supplier [3], prices have increased for more than 60 % of Flemish households. Clearly, when comparing end-user prices before and after liberalisation, different statements can be proved depending on the considered customer groups and data. Nevertheless, a certainty is that the expected decline in electricity prices has not taken place so far.

Moreover, electricity tariffs in Belgium are among the highest in Europe [4, 5]. Denmark, Germany, Italy and the Netherlands are the only countries in the EU-25 where the average residential customer pays more for electricity [5, 6]. Network charges constitute an important part of this electricity price. The sum of transmission and distribution network charges made up on average 43% of the total electricity bill excluding taxes in 2003 [4]. In addition, Belgian network charges are out of line compared with other European countries. The Belgian average total network charge for a low voltage customer of € 50/MWh<sup>1</sup> is only exceeded in Austria, Germany and Italy [5]. As a result, it can be concluded that the high Belgian electricity prices are for a substantial part caused by high network tariffs. Furthermore, according to Test-Aankoop, network tariffs even increased since the liberalisation. It is claimed by the Belgian consumer federation that compared to 2003, a typical Belgian household in 2004 paid 14% more for the distribution of their electricity [7]. In their annual report of 2004, the Belgian federal regulator CREG reported an average

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<sup>1</sup> Charges are estimated excluding all taxes and levies.

increase of 5,86% in the distribution network charges compared to 2003 for residential customers [8]. This was explained as being mainly due to the several public service obligations that are imposed on the distribution network operators, and will be discussed further in this paper. It is clear that network charges represent a substantial part of the cost of electricity and that this is not likely to change soon. In this paper, the reason why distribution network charges are so high in Belgium, and in particular in the Flemish region, is being looked at. The question whether they are caused by the inefficiency of some of the DSO's will be evaluated. Next, the situation in Flanders will be compared to the rest of Europe.

## 2. DISTRIBUTION NETWORK TARIFFS IN BELGIUM

Comparing distribution network tariffs between different DSO's is more difficult than expected, since DSO's do not publish one clear tariff. In the Belgian distribution network charges, a distinction is made according to different customer groups on the one hand and different tariff components on the other hand.

Two partitions in customer groups are regularly used: a partition according to the voltage level of the infrastructure part to which a customer is connected, and a partition proposed by Eurostat [9]. Which tariff is applicable depends on the customer group to which one belongs. The Eurostat partition in customer groups is based on consumption and facilitates comparisons, mostly on European level. The partition based on voltage level is necessary since in Belgium a cascade system is applied for the electricity network [10]. This implies that customers only pay for the costs of those infrastructure parts they utilize. Consequently, tariffs for a certain voltage level include costs of infrastructure on higher voltage. In Figure 1, the five customer groups used in Belgium in this partition are illustrated.

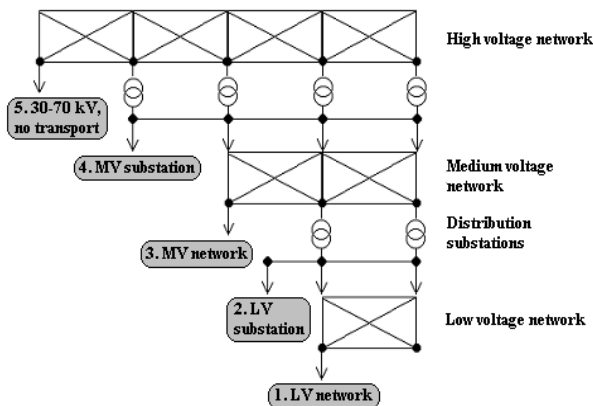


Figure 1: Five customer groups according to the voltage level of the connection

In addition to these partitions, the tariff for each customer group is further split up over different tariff components determined by law [11] such as connection, use of the network, support services and taxes. As a result, the final tariffs published by the DSO's are a complicated jumble with partitions per customer group and per tariff component. Because of this, it is practically impossible to objectively compare and discuss the finally published distribution network tariffs. As a result, the justness of the distribution network tariffs is in this paper evaluated based on the DSO's budgets, instead of on their finally published tariffs. After all, the tariffs are the direct result of these budgets, which are constituted out of two main parts: exploitation costs and public service obligations.

### 2.1. Public service obligations

DSO's cannot influence the second part of their budget, public service obligations. The government obligates them to provide a budget for three categories of public service obligations: social measures, measures to stimulate the rational use of energy and to stimulate green energy. Most of these are regional initiatives and in the rest of this paper, the emphasis will be on the Flemish region. The most important of these measures are given in Table 1.

Public service obligations in Flanders	
1. Social measures	
- Free electricity	Every household annually receives a free amount of electrical energy, namely 100 kWh per household increased with 100 kWh per family member.
- Specific social tariff	Certain customers such as senior citizens and disabled people are entitled to this tariff. Moreover they receive the first 500 kWh they utilize every year for free.
- Budget meter	Customers who cannot find a supplier willing to provide them with electrical energy receive a budget meter from their DSO. This is an electricity meter working on a prepaid basis and containing an additional emergency credit. When the customer has consumed the electrical energy paid for, including the emergency credit, a minimal supply of electricity is still delivered, the so-called 6 ampere.
- Protected customers	Socially vulnerable customers receive extra protection against a cut-off of the electricity supply and several other advantages such as the free installation of a budget meter.

<b>2. Rational use of energy (RUE)</b>	
1 % reduction in electricity consumption, compared to 2 years before.	In order to achieve this goal, DSO's have to take measures such as distributing premiums for the placement of better insulation or energy-saving systems. Each DSO can choose which measures he supports. For each kWh saved too little, a fine of € 0,01 has to be paid.
<b>3. Green energy</b>	
Free distribution of green energy (abolished)	Until the end of 2004, green energy had to be distributed free of charge. Since this was only the case in Flanders, the supreme administrative court of Belgium saw it as an obstruction to the principle of free trade of goods within Belgium. As a result, this measure was abolished. However, the DSO's already included these costs into their budget for the next year and thus tariffs are influenced by it.

**Table 1: The most important public service obligations in Flanders**

Clearly, a lot of public service obligations have to be fulfilled by the DSO's, resulting in high extra costs that are out of their control. Moreover, the Flemish government can, after consulting the Flemish regulator, impose additional public service obligations concerning investments in the network, connecting customers, the promoting RUE, etc [12]. For the DSO's this implies that without consultation, several substantial costs can be added to their budget at any time.

## 2.2. Exploitation costs

The part of their budget DSO's do control, the exploitation costs, includes costs and a fair profit margin since in Flanders; distribution network tariffs are determined using a "cost plus" system. This means that tariffs should allow a DSO to at least recover the costs coming from the tasks appointed to him. On top of that, a fair profit margin is allowed, in order to compensate for the capital invested in the network. This is necessary to guaranty the optimal development of the network in the long run [13]. Consequently, the profit a DSO is allowed to make is determined by his costs. Every year, DSO's are obliged to hand in a budget for approval by the federal regulator CREG, based on which the tariffs are determined. The cost components constituting this budget cannot be found in the annual report. How a DSO goes from the cost components in their bookkeeping to the ones in their budget is secret company information. As a result, the justness of this part of the budget cannot be evaluated, and it is impossible to form an opinion on the origin of the cost components in the DSO's budgets.

## 2.3. Relative importance of exploitation costs vs. public service obligations

What can be looked at is the relative importance in the budget of exploitation costs and public service obligations and their evolution. This is illustrated in Table 2. Most public service obligations did not exist before the liberalisation of July 1<sup>st</sup> 2003. Since then, their share in the total budget has substantially increased. Also in absolute terms, the increase is significant. Figures from the federal regulator CREG show that public service obligations constituted on average 4,25 % of the DSO's budget in 2003. One year later, this number was already the three-fold, namely on average 14 %. For all DSO's, the public service obligations budget has at least doubled. In some cases, it even increased from 1 to 2 % in 2003 to nearly a fifth of the budget in 2004. Meanwhile, on average more than a tenth of the budget is spend on obligations imposed by the government.

<b>Share and evolution of the public service obligations in the budget of the Flemish DSO's</b>				
	<b>2003</b>	<b>2004</b>	<b>2004 – 2003</b>	<b>Cost evolution in absolute value</b>
<b>DSO 1</b>	5 %	10 %	+ 5 %	+ 126 %
<b>DSO 2</b>	5 %	10 %	+ 5 %	+ 125 %
<b>DSO 3</b>	6 %	14 %	+ 8 %	+ 167 %
<b>DSO 4</b>	6 %	11 %	+ 5 %	+ 110 %
<b>DSO 5</b>	4 %	9 %	+ 5 %	+ 146 %
<b>DSO 6</b>	6 %	13 %	+ 7 %	+ 151 %
<b>DSO 7</b>	4 %	8 %	+ 4 %	+ 104 %
<b>DSO 8</b>	1 %	17 %	+ 16 %	+ 2352 %
<b>DSO 9</b>	2 %	18 %	+ 16 %	+ 910 %
<b>DSO 10</b>	3 %	17 %	+ 14%	+ 453 %
<b>DSO 11</b>	3 %	15 %	+ 12 %	+ 560 %
<b>DSO 12</b>	6 %	26 %	+ 20 %	+ 515 %
<b>Average DSO</b>	<b>4 %</b>	<b>14 %</b>	<b>+ 10 %</b>	<b>+ 477 %</b>

**Table 2: Share and evolution of the public service obligations in the budget of the Flemish DSO's<sup>2</sup>**

The most expensive public service obligation is the 100 kWh of free electricity to which every household is entitled, representing on average 9,45 % of the budget. Since this "free" electricity is paid for through the distribution network tariffs, it really is just a transfer of costs instead of a really free good. Only very small users pay less in the distribution network tariffs for the free current, compared to their savings because of the free electricity. Next, the placement of budget meters, the actions promoting RUE and the free distribution of green

<sup>2</sup> The DSO's included in this table are IVEG, Interelectra, WVEM, PBE, Gaselwest, Imewo, Iverlek, Imea, Iveka, Intergem, Sibelgas Noord and Etiz. Thus, four Flemish DSO's have not been considered, namely Elia, Biac, Gemeentelijk Havenbedrijf Antwerpen and Merksplas.

electricity constitute the major part of the public service obligations budgets.

As shown in Table 2, there are significant differences in the share of the public service obligations between the different DSO's. In 2003, the share of the public service obligations in the budget varied from at least 1 % to at the most 6 %. In 2004, the smallest share equalled 8 %, whereas the largest was no less than 26 %. Clearly, the variance in the budget shares increased significantly: from 2,93 % in 2003 up to 25,6 % in 2004. A possible explanation for this increase in variance is the fact that drawing up an appropriate budget for the public service obligations is far from evident. After all, most of these obligations have only been introduced recently and their precise cost is often difficult to predict. Since there are no past figures to base their budget on, DSO's can only try to make an appropriate estimation. The cost of the 100 kWh of free electricity for example, depends on the number of low voltage customers of a DSO. Such data are normally at disposal, and thus the cost price of this obligation can be budgeted fairly accurate. Other costs such as the placement of budget meters are a lot more difficult to predict. The cost of such a placement is known, however it is hard to estimate how many protected customers will lose their contract with their supplier. Also it is difficult to assess the number of people that will utilize the actions promoting RUE, or the costs needed to achieve a 1 % reduction in electricity consumption. Because of this, it is difficult for the DSO's to forecast the costs necessary to fulfil their public service obligations. Large differences in the expected costs between the different DSO's are a logical consequence.

The exploitation costs constitute a decreasing share of the budget because of the increasing importance of the public service obligations. Percentages of the CREG reveal the most important exploitation costs:

- The fair profit margin constitutes on average 31,33 % of the budget in 2003, and 28,56 % in 2004.
- The costs of study, construction and maintenance of the distribution network represent the main part of the budget and include all costs except for the fair profit margin and the costs of the public service obligations. On average these costs constituted 63,78 % of the budget in 2003 and 58,62 % in 2004. The main costs included in this category are operational costs (on average 27,68 % of the total budget), amortizations (15,64 %), pensions (6,62 %) and losses (4,95 %).

The efficiency of the Flemish DSO's can only be evaluated based on the exploitation costs, since this is the part of the budget that is under a DSO's control. The main cost factors on which such an evaluation can be based are the number of employees and the material fixed assets. After all, a DSO serving the same number of customers using only half of the equipment and staff of his colleague is clearly working more efficiently. However, based on

publicly available information, it is impossible to pronounce upon this for different reasons:

- Not all DSO's publish this information in their annual report.
- Several DSO's are not only active in the distribution of electricity, but also of natural gas and cable television. In the annual reports, the distinction between these different activities is not always made. As a result, personnel costs and material fixed assets cannot be compared strictly for electricity distribution.
- The mixed DSO's<sup>3</sup> cooperate since the liberalization in three new companies: Gedis [14] for strategic matters, promotion of RUE and public service obligations, Indexis [15] for reading the meters and Electrabel Netmanagement [16] for the daily exploitation of the distribution network. As a result, the personnel of these seven mixed DSO's are merged into these three new companies, making a comparison between the different DSO's impossible.

Clearly, whether the exploitation costs could be lower and thus whether the DSO's are working inefficiently cannot be evaluated based on publicly available information. Without a doubt a major cause of the high distribution network tariffs are the increasing costs of the public service obligations. The electricity sector in Flanders is overloaded with all kinds of obligations on which the market actors have no influence, but which constitute an increasing part of their budget. As a result, the high distribution network tariffs cannot be fully blamed on inefficiency of the DSO's. The question rises whether this is a typical Belgian situation, or whether DSO's in the whole of Europe are heavily loaded with public service obligations. In the next section, the situation of Belgian DSO's will be compared to the rest of Europe.

### 3. PUBLIC SERVICE OBLIGATIONS IN EUROPE

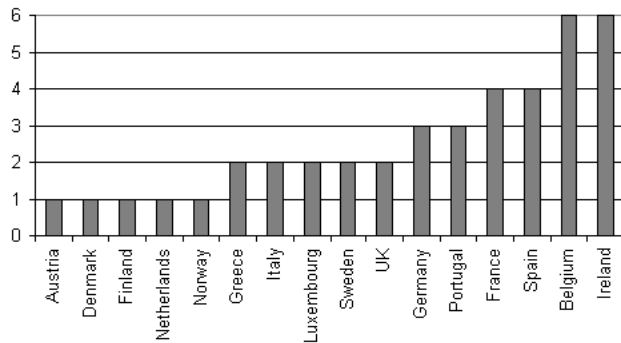
#### 3.1. Social measures

Belgium is one of the European countries with the most social measures imposed on the electricity sector. Figure 2 illustrates the number out of the following 6 social measures implemented in Europe in 2003:

1. End user price controls
2. Uniform tariff structure
3. Special tariffs for vulnerable customers
4. Prepayment meters (e.g. budget meters)
5. Free supply amount
6. Restrictions on disconnection of customers

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<sup>3</sup> In Flanders, most DSO's are partnerships between different local authorities. In a pure DSO, only local authorities are shareholders whereas in a mixed one, also a private company is involved. In Belgium, this is always Electrabel. In Flanders, there are 4 pure DSO's (Interelektra, PBE, WVEM and IVEG) and 7 mixed ones (Iverlek, Sibelgas, Iveka, Gaselwest, Imewo, Intergem and Imea).



**Figure 2: Number of social measures implemented in Europe out of 6 measures**

Belgium and Ireland are the only countries in which all 6 social measures were implemented. Logically, this could partly explain the relatively high Belgian distribution network tariffs. After all, the main part of these social measures is in Flanders imposed on the DSO's. This again illustrates that the electricity sector in Flanders is burdened with several social policy functions on which market actors have no influence.

### 3.2. Rational use of energy

In December 2003, the European Commission made a proposal for a Directive on energy end-use efficiency and energy services [17]. This Directive, which has a time horizon from 2006 to 2012 and should be translated into national legislation on 1 June 2006 at the latest, sets out a number of mandatory targets and obligations:

- A cumulative annual energy end-use savings target of 1% of the amount of energy distributed and/or sold to final customers in a base period.
- A demand-side target for the public sector, requiring to save at least 1,5% of energy per year.
- A supply-side obligation on the sale of energy services: energy services would have to be integrated into the distribution and sales of energy companies for a target share of 5% of their customers.

Clearly, the roles of DSO's and energy suppliers are mixed in this Directive proposal. Member States are free to choose whether they impose these obligations on DSO's and/or energy suppliers. Consequently, profit maximisation for these companies becomes more closely related to selling energy services to as many customers as possible, instead of selling as much energy as possible to each customer. As a result, DSO's and/or suppliers become energy service companies, offering energy efficiency as a product to their customers.

As said above, in Flanders such an obligation is already imposed on the DSO's, obligating them to attain a 1% reduction in electricity consumption, compared to 2 years before. However, the question arises whether DSO's are

well situated in the liberalized markets to fulfil obligations concerning energy efficiency. It is the authors' opinion, in line with the union of the electricity industry Eurelectric, that there should be a clear distinction between suppliers working in a competitive and liberalised market on the one hand, and DSO's working in a monopoly net-bound market on the other hand [18, 19]. In their opinion, DSO's should not be obliged to market energy end-use efficiency, because this would be incompatible with the unbundling provisions of the Directive 2003/54/EC. Imposing public service obligations on DSO's forces them to perform a public supply of mixed character comprising a regulated monopoly business together with a business exposed to competition. A DSO's exclusive activity should be the ownership and management of the network. DSO's might not have a link with final customers and, thus, cannot be accountable for energy end-use efficiency. Instead, the Directive should address all those players who are active in the energy efficiency markets and create a framework for stimulating an energy-savings culture, fostering a market-based approach encouraging development and implementation of energy efficiency measures. Forcing electricity companies to sell energy services or products that customers might not wish to buy is not in line with the liberalised electricity market.

### 3.3. Green energy

Nowadays, no obligation concerning the promotion of green energy is imposed on Flemish DSO's anymore, after the abolishment of the free distribution. This in line with the point of view of the European Commission, who states that public service obligations concerning environmental protection are best placed on suppliers rather than DSO's [5].

## 4. CONCLUSION

It is demonstrated in this paper that the relatively high Flemish distribution network charges are for a substantial part caused by the increasing costs of public service obligations. A lot of public service obligations have to be fulfilled by the DSO's, resulting in high extra costs that are out of their control. Moreover, without consultation, several additional public service obligations can be imposed on the DSO's at any time, resulting in even more additional costs. Without any doubt public service obligations serve a good cause and are necessary in a liberalised electricity market. However, implementing them the way it has been done in Flanders leads to large differences in distribution network tariffs, only due to differences in DSO's estimations of the required costs.

Comparing the Flemish situation to the rest of Europe, it becomes clear that not only there are a lot of public service obligations in Belgium, but also that they are not always imposed on the most appropriate market player.

After all, imposing so many public service obligations on DSO's almost forces them to become energy service companies. However, their core business still is the maintenance and operation of the distribution network, and they are not a commercial player in the market.

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