Defining Cost to Serve and Quality of Service in the electricity supply sector.

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Abstract

The liberalization of many European electricity markets has increased the focus of electricity suppliers on the reduction of their Cost to Serve. However, the Cost to Serve and the Quality of service of utility companies is ill described/defined in the current literature as well as in the electricity supply sector itself, which results in an imprecise composition of the Cost to Serve and incorrect measurement of the quality of service. Interviews with experts from the Belgium and Dutch electricity supply sector are used to create a framework which enables the transparent and consistent allocation of processes to the Cost to Serve as well as the required insights to define quality are collected. The application of the framework to the, in general, performed processes by electricity suppliers has shown the processes which are the key drivers of the Cost to Serve as well as the importance of correct quality measurement have come to light. Further research is required to assess the cost of the identified processes and to analyze how the cost of these identified processes can be further reduced, as well as the impact of these processes on the quality of the provided service. Further on indicators to measure quality of service need to be developed

Keywords; Cost to Serve, Quality of service, Electricity supply,

Introduction

In line with the embedded liberal approach of energy markets by the European Union, many EU member states have liberalized their electricity markets during the last decade (Correljé & Linde, 2006). This liberalization has changed the relation between energy supply companies and their customers, since in an open market consumers have the ability to switch between electricity providers (Milroy & Li, 2001). In order to optimize the profitability and safeguard their continuity, electricity supply companies can differentiate themselves from other electricity supply companies on three different factors knowing:

- Price of electricity
- Quality of the provided service [QOS]
- Environmental sustainability

Due to the high price sensitivity of energy consumers (Energiekamer, 2012), many electricity suppliers decide to focus on the price of electricity. In case electricity suppliers choose to focus on price, they are incentivized to reduce their expenses and therefore it is useful to focus on key cost components. For retail electricity suppliers Cost to Serve [CtS] is one of the key cost components (CapGemini, 2011). However, when focusing on the reduction of CtS the quality of service [QOS] cannot be ignored. Research indicated that both CtS and QOS are ill defined by the electricity supply companies.

Current academic literature does not describe which processes are the key contributors to the total CtS (Gensler, Leeflang, & Skiera, 2012). Correspondingly interviews with experts of the electricity supply industry (performed in this research) pointed out that, the energy supply companies currently allocate processes to CtS based on intuition. As a result of the intuitive way of allocating processes to the CtS it is not only more difficult to compare the CtS among different electricity suppliers, it is also blurring the insights a company has. If for example an electricity supply company wants to reduce its electricity price by reducing their CtS while they allocate processes to their CtS which actually don not contribute to the CtS the wrong divisions in the organization are controlled and steered to reduce the organization's expenses.

Like CtS QOS is ill defined, QOS is however, more difficult to define in a measurable way due to its complex nature. The two main causes of the complexity of QOS are:

- QOS is mainly measured outside the organization (mostly measured at customers)
- Electricity suppliers are the last organization in the electricity value chain. The complete value chain contributes to the quality experience of the customer, this makes it difficult to measure the contribution of the supply companies to the QOS.

Literature gives some suggestions on which quality aspects need to be measured it however, gives no suggestions how these aspects need to be measured.

The goal of this paper is to come up with a consistent and transparent way of allocating processes to the CtS as well as a suggestion on how to define and measure QOS (due to the limited time available for this research it is not considered possible to come up with a measurable definition of QOS). The scope of this research focusses on business to consumer [B2C] electricity suppliers in Belgium and the Netherlands.

This paper consists of two parts; the first part addresses the CtS while the second part addresses the QOS. The findings of both parts are integrated in the conclusions. The final section presents suggestions for future research.

Cost to Serve

To be able to create a consistent and transparent way of allocating processes to the CtS, a CtS selection framework is created. Insight in which processes are performed by electricity suppliers and the contribution of these processes to the CtS is required. Interviews with experts from the electricity

supply sector were chosen as a mean to collect these insights. The goal of these interviews is to collect the insights in the form of financial data, this data should allow the researchers to see how much each of the processes allocated to the CtS contributes to the CtS and therewith it should be possible to prioritize the processes in relation to their contribution to the CtS. Since the scope of this research is limited to B2C electricity suppliers in the Netherlands and Belgium, only companies which fit that description are approached to participate in the expert interviews. In total 14 companies were approached to participate in the interviews, eight of these companies agreed to participate in the interviews.

As preparation for the series of interviews a questionnaire is set-up. Since the goal of the interviews is to get an overview of which processes are contributing to the CtS as well as insight in the financial contribution of these processes to the CtS and the current literature has not described this phenomenon yet (Gensler, Leeflang, & Skiera, 2012), it is chosen to set up the questionnaire on the basis of the Straussian approach of grounded theory.

In line with the Straussian approach of grounded theory the basis of the questionnaire is founded on two interviews with two experts of the electricity supply industry (Crols, 2012) (Vermeiden, 2012). Insights which were derived from the interviews performed after these two interviews were used to increase the level of detail of the interviews. If for example one participant mentioned a process in relation to CtS and this process was not mentioned in the previous interviews this process was taken into account in the upcoming interviews.

Although the participants of the interviews were given a description of the content of the interviews when they were approached to participate in the interviews, most of them appeared to be reluctant to present the financial data behind the processes driving the CtS. This unexpected reluctance of the participants has influenced the CtS selection framework, since the lack of data disables the function of the framework to prioritize the influence of processes contributing to the CtS. However, the interviews still produced a lot of information which contributed to the insights required to set-up the CtS process selection framework.

The main findings of the expert interviews are presented below:

None of the participating companies had the same definition of CtS, while most companies seemed to allocate processes to the CtS based in intuition instead of a consistent and transparent framework (hence the need for such a framework to be created).

Although the CtS is strictly monitored five of the eight participating companies measure the components (for example FTEs and IT cost) behind CtS and not the cost of each process (for example subscription and billing). This means that even in the case they were willing to present their CtS data, the data had to be allocated according some distribution rules which would blur the actual cost of each process when compared to the direct monitoring of each process. None of the companies used the same definition of CtS, even the subsidiaries of the three large Dutch energy suppliers have different CtS definitions from their parent companies.

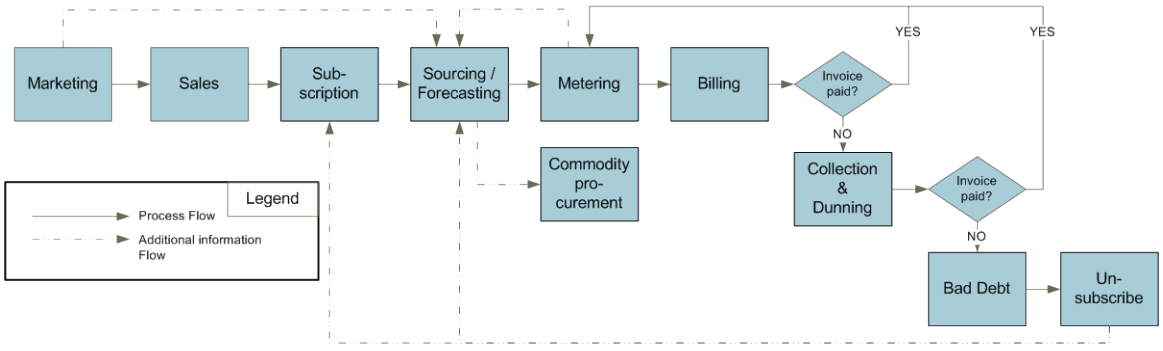
The companies which measured their CtS by adding the component cost often mentioned the following component cost:

- FTEs
- Housing
- Postal and printing
- IT
- Overhead
- External Call Center

While the participants which base their total CtS on the summation of their expenses on processes often pointed out the following processes:

- Subscription
- Sourcing/ Forecasting
- Metering
- Billing
- Bad Debt collection
- Marketing
- Continues improvement of processes

Based on the insights derived during the first series of interviews a flow-scheme (figure 2) which represents a general and abstract way of operations at electricity suppliers is created. The participants of the subsequent interviews were asked if they could identify their way of operating their company in that flow-scheme.



Since only one participant had a remark on the flow-scheme (they operate in an area with very specific regulations) the flow-scheme is seen as a good and generally accepted way of representing the processes performed by electricity supply companies in the Netherlands and Belgium.

The Cost to Serve process selection framework

Figure 1 Composition of the electricity price before transport and tax.

All the companies that participated in the expert interviews indicated that they divide the cost incurred in their company according the segments of the figure above (figure 1). However, the allocation of each of the processes to these segments is done according their intuition. This intuition, combined with the fact that in general sense each of these companies operate in the same way, while in detail they all operate in their own unique way, leads to different understandings of the correct allocation of processes to CtS and therewith to different definitions of CtS.

Figure 2 Flow-scheme of general and abstract operations at electricity suppliers

The goal of this research is to create a framework that allocates processes to the CtS in a consistent and transparent way in order to be accepted by the majority of the electricity suppliers. With this purpose of the framework

in mind the transparency and consistency of the allocation of the processes to the CtS has to be safeguarded. This is done by the framework presented in the table below (Table 1). Prior to applying the rules described in table 1, two other steps are required:

1. Identify all processes performed in the organization. The participants in the interviews all acknowledged that they have enough insight in their processes to identify all processes. If this insight is lacking it is advised to use IDF0 to identify all processes.
    - Output → List of processes
2. Classify all sub-processes behind these processes. The participants in the interviews all acknowledged that they have enough insight in their sub-processes to identify all sub-processes. If this insight is lacking it is advised to use IDF0 to identify all sub-processes.
    - Output → List of sub-processes

The sub-processes, which are the outcome of step 2, are the sub-processes which should be applied tested on their applicability of the rules presented in table 1.

Table 1 Framework for the selection of processes contributing to the CtS

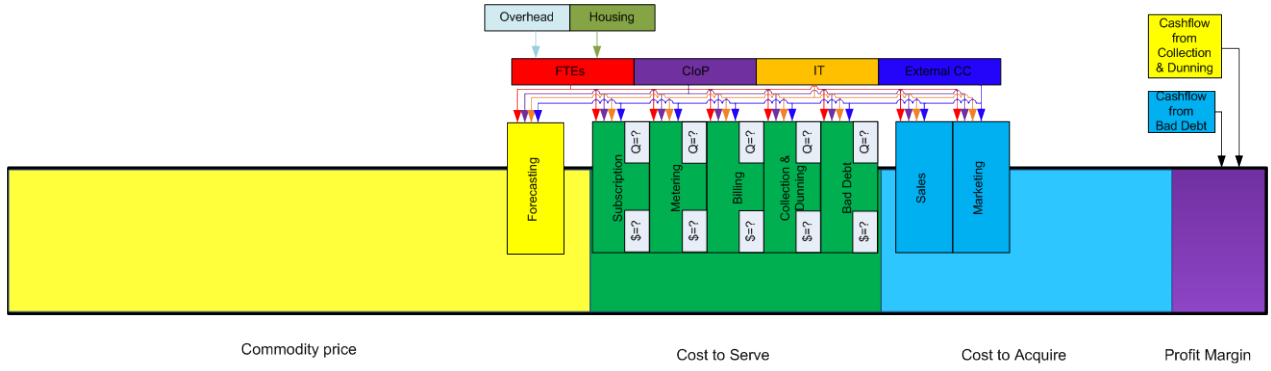
Rules for inclusion in CtS		Reason to apply rule
1.	**Process should influence the service experience of customers**	An important step to make the CtS comparable between companies, is dividing the total CtS by the number of connections (due to the difference in bi-fuel and single fuel contracts). Despite the fact the CtS is expressed as €/connection, every connection still belongs to a customer and therefore only processes that influence the service experience of customers should be included. Processes performed for potential customers should not be included in the CtS.
2.	**Only processes that influence the QOS are included in CtS**	Bearing in mind that service processes are primarily created in order to provide service to the customers, it can be concluded that processes which don't influence the quality of the service, should not be entitled as service processes.
3.	**All cost should be allocated to either Commodity, CtS, CtA or Margin**	Processes are decomposed to such a level that there is no overlap between the different cost segments. Therefor all cost should be allocated to; commodity price, CtS, CtA or margin. When for example looking back on the earlier mentioned example of marketing. It is expected that marketing doesn't only influence potential customers, however it also has a retentional effect on existing customers. Nonetheless since the magnitude of this effect is not known, it is decided to solely allocate the marketing cost to the CtA
4.	**Allocation should be based on sub-processes**	Due to the required level of detail, to be able to perform the above mentioned rules, the processes should be allocated according their sub-processes.

5.	**Cost components should be allocated to processes based on their activities, when not enough insight available the cost components can be allocated to the number of FTEs required to perform each process**	The interviews pointed out that currently it is common practice to allocate the component cost (for example IT cost) to the number of FTEs. However, to increase the insight in the cost of the processes it is best to allocate the cost directly to the processes when this is possible. If for example specific software for the billing process is procured (and this can be demonstrated) the cost incurred by this purchase should be allocated to billing. In preference to allocating these costs to the entire organization, as general IT expenses, according to the number of FTEs contributing to each process.

The definition of Cost to Serve

The framework described in table 1 is applied to the sub-processes, which came to light during the expert interviews. The detailed flow-scheme of the sub-processes is based on the insights of all the participants in the expert interviews as well as insights from Ferranti. The application of the framework has led to the allocation of; subscription, metering, billing, collection & dunning and bad debt to the CtS and the exclusion of; marketing, sales, and forecasting as CtS processes.

Figure 3 Graphical representation of the allocation of processes to the CtS



The figure below (Figure 3) gives a graphical representation of the allocation of processes to the CtS as well as the allocation of component cost to these processes. Although the framework only identifies processes contributing to the CtS and makes no claims for the allocation to other cost segments, conventional knowledge is used to decide to which cost segments the excluded processes should be allocated. Due to the fact that no financial data behind the processes available it is not possible to calculate the total CtS for this example or to arrange the processes in the order which they contribute to the CtS. In case managers would like to reduce their CtS, the cost of each process contributing to the CtS, would be a good starting point to select the processes which they want to improve.

Quality of service

The definition of CtS has identified which processes contribute to the CtS. This insight allows business controllers to choose which processes they want to influence in order to reduce the CtS. However, reducing the CtS without taking the QOS into account might have a negative effect on the amount of customers and in the end on the continuity of the organization.

As mentioned earlier QOS has a complex nature, since it has to be measured outside the organization (customers decide the quality level) the number of respondents is expected to decrease when the number of questions increase. However, extensive research might be required to obtain a good view of the QOS due to the multi-actor complexity of electricity supply.

The interviews pointed out that currently quality is defined as a series of one-dimensional KPIs which are defined by the companies themselves. These one-dimensional KPIs don not take the interrelations between processes into account which is required to adequately monitor the QOS level (Jaiswal, 2008). Often the participants only measure the NPS, which is a good indicator of customer satisfaction. However, customer satisfaction should not directly express the quality level (Dabholkar, Shepherd, & Thorpe, 2000).

The mostly used KPI is the net promoter score [NPS], the NPS is so popular because it is easy to measure which leaves more time to improving quality instead of measuring it (Reichheld, 2003). However, the NPS measures customer satisfaction which is highly correlated to QOS but not the same (Dabholkar, Shepherd, & Thorpe, 2000). Figure 4 gives a graphical representation of the current and suggested way of measuring QOS.

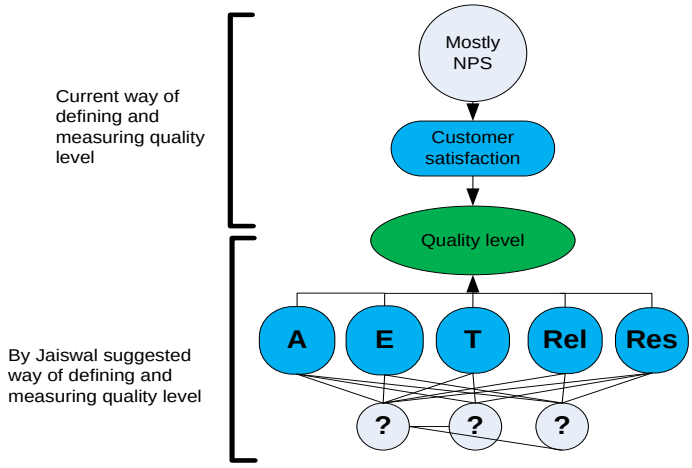


Figure 4 Representation of current and required way of defining and measuring quality level

As depicted in the figure above and described by Jaiswal it is preferred to measure QOS not only on the basis of customer satisfaction but on the five dimensions reliability, responsiveness, assurance, empathy, and tangibility. However, no literature is found that suggest how to measure these five dimensions.

One example of a question that could be used to measure the level of responsiveness and reliability is to ask customers how long it took for their problem to be solved and if the first solution they were offered really solved the issue. However, such a question only measures the QOS in case something already went wrong. It gives no information of the customers perceived QOS in times al processes function as planned. Another issue that is not yet solved is the fact that no information is collected about the impact of the different actors (electricity producers, electricity transporters, electricity distributors) on the QOS.

Conclusions

The interviews pointed out that the flow-scheme presented in figure 2 gives a fitting as well as a by the participants accepted representation of the activities performed by electricity suppliers.

Six out of the ten processes depicted in figure 2 are allocated to the CtS knowing; subscription, metering, billing, collection & dunning and bad debt and the exclusion of; marketing, sales, and forecasting as CtS processes.

None of the participating companies has the same definition of CtS, even subsidiary companies have different definitions of the CtS from their parent companies. The participants in the expert interviews indicated that currently processes are currently allocated to the CtS based on intuition, therefore it is expected that the CtS process selection framework will be accepted by the industry due to its contribution to transparency as well as consistency, in allocating processes to CtS.

As already mentioned in the introduction, the interest of electricity supply companies in CtS is increased due to the changed relation between suppliers and their customers. The interviews pointed out that it is important to safeguard the quality of service while attempting to reduce the CtS. However, none of the participating companies uses a pre-defined definition of quality to measure the QOS. They all express quality in customer satisfaction, which is often measured by NPS. The measurement of customer satisfaction without any other aspects of quality gives no insight in the influence of the different actors in the electricity supply chain on the quality of service. This insight is required to pin point which actor is responsible for which part of the quality and therewith which actor should act in case the QOS has to be improved.

Another issue with regard to the measurement of quality is that the current way of customer satisfaction is only measured when customers have had contact with their energy supplier, this contact is often based on complaints. The participants of the interviews reasoned that in case consumers do not contact their energy supplier they must be satisfied, however, this might change when electricity suppliers increase their value chain by supplying for example charging stations for electric vehicles. The way how electricity suppliers measure their QOS has to adapt to their new business models.

Suggestions for future research

Based on the findings of the expert interviews as well as the conclusions from this research some suggestions for future research can be made.

Due to the fact that no financial data is presented during the interviews, it was not possible to identify the cost behind each sub-process. It is moreover not known at what level the energy supply companies administer their cost. In case companies keep detailed records of their cost it is expected that they are able to allocate cost directly to each sub-process, if they however still need to collect data at a more detailed level it is suggested to apply activity based costing [ABC] (Lin, 2012). The suitability of ABC to gain insight in the cost of the energy supply companies is not known (Kone & Karwan, 2011), as well as it is unknown if it is necessary to identify cost with ABC or that companies already have this data at hand (Major & Hopper, 2005). Therefore it is suggested to first search for an energy supply company which does not have the data at hand

and subsequently this company can be asked to join in a case-study to test the applicability of ABC to identify cost of an energy supply company's sub-processes.

The reason for the increased interest in CtS is the increased interest in the reduction of the expenses made by the electricity supply companies combined with the fact that the CtS is one of the main components of these expenses (CapGemini, 2011). However, when attempts are made to reduce the CtS it is important to safeguard the quality of service. Prior to the expert interviews it was expected that the energy supply companies had a definition of quality as well as the fact that they would measure this quality level. However, the interviews pointed out that quality is ill defined and therewith quality level is not measured well at the energy supply companies.

Nonetheless in order to be able to reduce the CtS without losing customers it is necessary to have a definition as well as data of quality of service. When it became clear that currently quality is not defined as such within energy supply companies an attempt has been made to incorporate a quality of service definition in this research, however without the data from the participants it proved impossible to define a quality definition (Fassnacht & Koese, 2006). Literature on quality scales has led to the conclusion that the quality should be measured on different dimensions (Parasuraman, Zeithaml, & Berry, 1988). It is advised to do further research to create a definition of quality of service based on the five dimensions of quality of Jaiswal (Jaiswal, 2008). Currently quality of service is indicated by customer satisfaction which is mostly measured in net promoter score (Reichheld, 2003). This research advises to indicate QOS based on; assurance, empathy, tangibles, reliability and responsiveness. However further research is required to define measurable indicators of these five dimensions of quality. As well as the impact of each actor in the electricity supply value chain on the quality level.

The influence of the changing business models of the electricity supply companies (where they try to increase their value chain by supplying additional related products like electric vehicle power stations) on the way QOS needs to be monitored, requires future research in order to ensure that the new customer needs are defined and measured correctly.

The research performed, focused on electricity supply companies in the B2C domain in Belgium and the Netherlands, however, future research should point out if the CtS process selection framework also can be useful for other utility industries. It is not sure if this framework can be directly applied to for example the water industry due to the different dynamics of the markets. Electricity cannot be stored in large volumes and therefore the electricity production and demand always have to be in balance, as well as the fact that in order to supply electricity at a consumer different organizations have to communicate with each other. In the example of water storage is possible, as well as that the fact that the complete supply chain is controlled by one organization (this sector is not liberalized). Due to these differences future research of other utility industries is required to check the applicability of the roadmap in other utility industries.

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