LAPPEENRANTA
UNIVERSITY OF TECHNOLOGY

LAPPEENRANTA UNIVERSITY OF TECHNOLOGY
ELECTRICAL ENGINEERING

Customer in electricity market

M.Sc. Salla Annala

Prof. Samuli Honkapuro

Prof. Satu Viljainen

BOX 20, FIN-53851 LAPPEENRANTA, FINLAND, tel. +358 5 62111, fax. +358 5 621 6799
http://www.lut.fi

Table of contents

1 Introduction 3
2 Processes 5
2.1 Current state of processes 5
2.1.1 Contracts 5
2.1.2 Connections 6
2.1.3 Billing 8
2.1.4 Price changes 9
2.1.5 Customer service 10
2.1.6 Supplier switching 10
2.1.7 Moving 12
2.1.8 Quality of supply 14
2.1.9 Queries 16
2.1.10 Debt collection 17
2.1.11 Interruption of electricity supply 18
2.1.12 Directive on energy end-use efficiency and energy services 19
2.1.13 Collection of taxes 21
2.1.14 Metering 21
2.2 Differences to the supplier-centric model 23
2.3 Possible problems 28
2.4 Nordic industry's opinions about retail market models 29
3 Customers' experiences of open electricity market 33
3.1 Available information on open electricity markets and prices 34
3.2 Experiences of supplier switching 35
3.3 Opinions about market functioning 35
3.4 Selection criteria and reasons for not switching 36
3.5 Customer surveys from other countries 38
4 Customer service inquiry 40
4.1 Customer service arrangements 40
4.1.1 Suppliers' and DSOs' shared customer services 41
4.1.2 Fault situations 41

4.1.3 Energy efficiency services 42
4.2 Customer contacts 42
4.3 Quality of customer service 44
4.4 Expectations towards customer service 44
4.5 Suppliers' and DSOs' roles – customer view 45
5 Conclusions 47
6 References 49

1 Introduction

The European Union strives to promote competition in electricity markets. Retail market model together with customer communication plays an important role, because they affect on how customers understand the division of duties between electricity suppliers and distribution system operators (DSOs), and their own opportunity to switch supplier.

At the moment, two basic market models are used in Europe. The visibility of DSOs' role to the customers is one of the main differences between them. The supplier-centric market model, in which customers have contractual relation only with the supplier, and always receive one combined bill for electricity supply and network service is applied for example in Germany, France and the UK. The market model that accentuates the different roles of suppliers and DSOs is applied for example in the Nordic countries (Finland, Sweden, Norway, and Denmark). The role of the DSO is however not totally invisible to the customer even in the countries that apply the supplier-centric market model. The customers contact the DSO in issues related to connections and electricity quality in most European countries regardless of the applied retail market model.

Lately there has been discussion about whether retail market models should be harmonized at the European Union level (EC 2007). If the supplier-centric model would be used as the basis of the harmonized model, great changes would be required in Finland and in the other Nordic countries.

This report examines the implementation of processes on the customer interface in the Finnish electricity retail market. The report defines the most important retail processes and the parties responsible for them. The examined processes include for example billing and metering. Also the data flows between market actors are studied, as well as the visibility of the processes to the customers. The report also estimates how applying the supplier-centric market model would change the processes.

Furthermore, customers' experiences in open electricity markets are studied. This information is based on previous customer surveys, and on views of people working in customer service duties in electricity supply and network companies. The customer service arrangements and expectations towards customer service staff are also examined.

2 Processes

This chapter examines the processes on the customer interface. At first, processes related to the customer interface and the party responsible for the processes are defined. The data flows related to the processes and the visibility of the processes to the customers are also described. Furthermore, it is discussed what kind of changes applying the supplier-centric retail market model would require.

2.1 Current state of processes

2.1.1 Contracts

Contracts between customers and electricity suppliers are regulated by the Finnish Electricity Market Act (386/1995). Connection contract is approached in the section concerning the connection process.

Electricity network contract

Electricity network contracts are made between customer and DSO. Electricity network contracts do not have to be made in writing unless one of the contracting parties demands so. However, in case of an oral contract, DSO must send a confirmation notification to the customer.

DSO may not terminate an electricity network contract that is made with a consumer. Also the right to terminate a contract concluded with another customer than a consumer is limited. When a customer terminates the contract, the notice time is two weeks, for DSO it is three months.

Electricity supply contract

Electricity supply contracts are made between customer and supplier. Electricity supply contracts do not have to be made in writing unless one of the contracting parties demands so. In case of an oral contract, supplier must however send a confirmation notification to the customer.

Supplier may not terminate a supply contract that is made with a consumer under obligation to deliver. When a supplier terminates a supply contract that is made under obligation to deliver with another type of customer, the notice time is three months. When a customer terminates a supply contract the notice time is two weeks. The same time limit is applied also when a supplier terminates a contract that is not made under obligation to deliver.

Single contract for electricity supply and network service

Customer that buys electricity under obligation to deliver has to have an opportunity to make a single contract that includes both electricity supply and network service. This kind of contract is made between customer and supplier.

If a single contract is terminated, for example when customer switches supplier, customer's DSO sends the customer a confirmation notification about a new electricity system contract within two weeks of concluding the contract. The confirmation notification has to be sent because the previous contract was concluded with the supplier (Lehtomäki 2009).

Discussion

In practice, the network contract is often concluded by the supplier on behalf of the customer. The contracting parties are, however, always the customer and the DSO; the supplier acts only as a middleman and has no contractual relation with the DSO. Before planning any changes to the contracting process, it should be taken into account whether the DSOs wish to maintain a contractual relation with the customer.

2.1.2 Connections

According to the Electricity Market Act, DSO must on request connect to its system consumption sites and power generation installations that meet the required technical specifications. Compensation levied by the DSO for connection must be reasonable. Typically, the connection fees depend on the size of customer's main fuse and the distance from the distribution network.

A customer who wants to connect to the distribution network must conclude a connection contract with the local DSO. Connection contracts are always made in writing. Customer may terminate the contract only if there is no valid network or supply contract in the same place of electricity use. DSO may not terminate the connection contract (Electricity Market Act).

Before making the contract, the DSO needs information about the size of customer's main fuse and the location of the connection. Therefore, many DSOs request the site layout plan in which the location of the main distribution board is shown. The connection fee and other terms of delivery are also included in the contract. The date when the DSO connects the customer to the network can be set in the connection contract, or it can be set later (following the notification deadlines applied by the DSO).

The costs of service line are not included in the connection fee. The customer may buy the service line from the contractor he/she wants. DSOs may give recommendations about contractors on request, and some also sell service lines. The service line must be sized and installed according to DSO's requirements.

Before the connection is made, customer's constructor sends the DSO a request to install the meter (if it was not agreed in the connection contract). The constructor also requests the DSO to connect the customer to the network.

Construct time

Customer or his/her constructor may rent a temporary distribution board that is used until the final connection is built. Alternatively, the final distribution board can be built early and placed outside of the building under construct and used already at the construct time.

Compensations upon delay in connection

According to the Electricity Market Act, the customer may withhold payment if the connection has not been made on the due date of connection fee and the delay is attributable to the DSO. Furthermore, the customer is entitled to a standard compensation

upon delay in connection. During the first two weeks of delay, the standard compensation is five percent of the connection fee, and thereafter 10 per cent for each beginning week of delay. The maximum compensation is however 30 per cent of the connection fee. The customer is also entitled to compensation for damage suffered because of delay, if the DSO or supplier can not show that the delay was caused by an obstacle that is beyond its control.

Transfer of connection contract

Connection contract is not transferred automatically when ownership of real estate changes (for example when the old subscriber sells his/her house). The transfer can be mentioned in conveyance of property or in a separate deed of transfer. The transfer can not be made if the old customer has outstanding debts to the DSO unless the new customer assumes the responsibility for these debts (ET 2005).

Discussion

The connection process is closely related to building of networks, and is therefore a natural part of DSOs' duties. Furthermore, it is not directly connected to suppliers' processes.

2.1.3 Billing

Normally, the customers who buy electricity from the supplier that is affiliated to the local DSO receive one combined bill that includes both the costs of electricity supply and network service. In most cases, the customers who do not buy electricity from the local supplier receive separate electricity supply bill from their supplier, and network service bill from their DSO.

In Finland, there are only few suppliers that offer their customers a possibility to a combined bill regardless of customers' DSO. The combined bills may be offered because some customers consider separate bills as a barrier to switching. Combined billing with other than the local DSO requires lots of work, which can be expensive and often has to be done manually. There is, for example, no commonly agreed method for notification on

the changes in the network service fees. Therefore, the suppliers need to manually write down to their database the network service fees applied to their customers. The number of different fee structures is high because all DSOs set their fees for different types of customers individually. Therefore, combined bills have not become common and some suppliers have ceased to offer them (Lehtomäki 2009).

Discussion

According to a previous customer survey (Innolink Research 2005), at least part of the customers see the separate bills for electricity supply and network service as a barrier to switching. A harmonized procedure for combined billing with other than local supplier could enable more suppliers to offer single bills to their customers.

On the other hand, although most customers would probably not mind receiving single bill (the costs of supply and network service are always shown separately), it should be born in mind that some DSOs may wish to maintain the billing relation with their customers. The need for maintaining the relation has not been inspected carefully. If the DSOs' needs collide with customers' interest, the needs and the incentives behind them should be critically evaluated.

2.1.4 Price changes

A notification about a price change has to be sent to customer's invoicing address at least a month before the change takes effect. This rule is applied both to supply and network service fees. The notification method has been criticized by some suppliers. In many other countries the notification periods are shorter and a personal notification to all customers is not required. Instead, the notification can be done for example in a local newspaper.

Discussion

Today, the same regulation concerning price changes is applied both to DSOs and to suppliers. Wider use of combined billing would not necessarily require changes in the regulation concerning price changes. It should, however, be considered about who should

inform the customer about a change in the network service fee if the customer receives a single bill from his/her supplier. If suppliers notify the customers about changes in the network service fees, the notification process will take more time (notification first from the DSO to the supplier, and then from the supplier to the customer).

Today, DSOs may change their prices whenever they wish to. Therefore, a supplier that charges the network service fee on behalf of several DSOs may constantly receive notifications about changes in prices. Often the change concerns only a small share of the supplier's customers. Usually, the changes in network service fees are decided in good time. Therefore, this problem could possibly be solved by harmonizing the notification method and by agreeing on dates in which the changes would be made.

2.1.5 Customer service

Customer service is one of the key processes on the customer interface. Customer service arrangements are discussed in chapter three, based on an inquiry made to customer service staff of electricity companies.

2.1.6 Supplier switching

The supplier switching process is regulated by the decree 809/2008 of Ministry of Employment and the Economy, and by the Government decree 66/2009. When a supplier concludes a contract with a new customer, he/she needs the customer's metering point ID. The customer finds this information from the bill for network service. If the customer does not give this information, the supplier can search it from the nation-wide consumption place register. In March 2009, the register contained information of approximately 60 DSOs. The Register contains majority of the consumption places, since all the largest DSOs are registered (Lehtomäki 2009).

Information exchange between suppliers and DSOs is done by using Prodat messages. The new supplier has to inform customer's DSO about the new contract at the earliest three months, and at the latest 14 days before the start of supply. The message must include customer's metering point ID and proposed begin of supply date. The DSO must within two work days of receiving the message, inform the customer's current supplier.

The current supplier must within two workdays of the DSO's message send the DSO a message about whether the new supply can be started. The only reason why the current supplier may send a negative message is that the customer has a valid fixed-term contract. In case of negative message, the DSO informs the new supplier at the latest the next workday after current supplier's message.

If there is no obstacle to new supply contract (or if the current supplier has not notified about one), the DSO informs the new supplier within five workdays of the new supplier's first message. At the same time the DSO also sends estimation on customer's annual electricity consumption.

The DSO sends within 10 workdays since the new supply has started, the customer's meter value at the time of switch to the old and the new supplier. To the new supplier, the DSO also sends customer's estimated annual consumption. The switching process is described in figure 2.1.

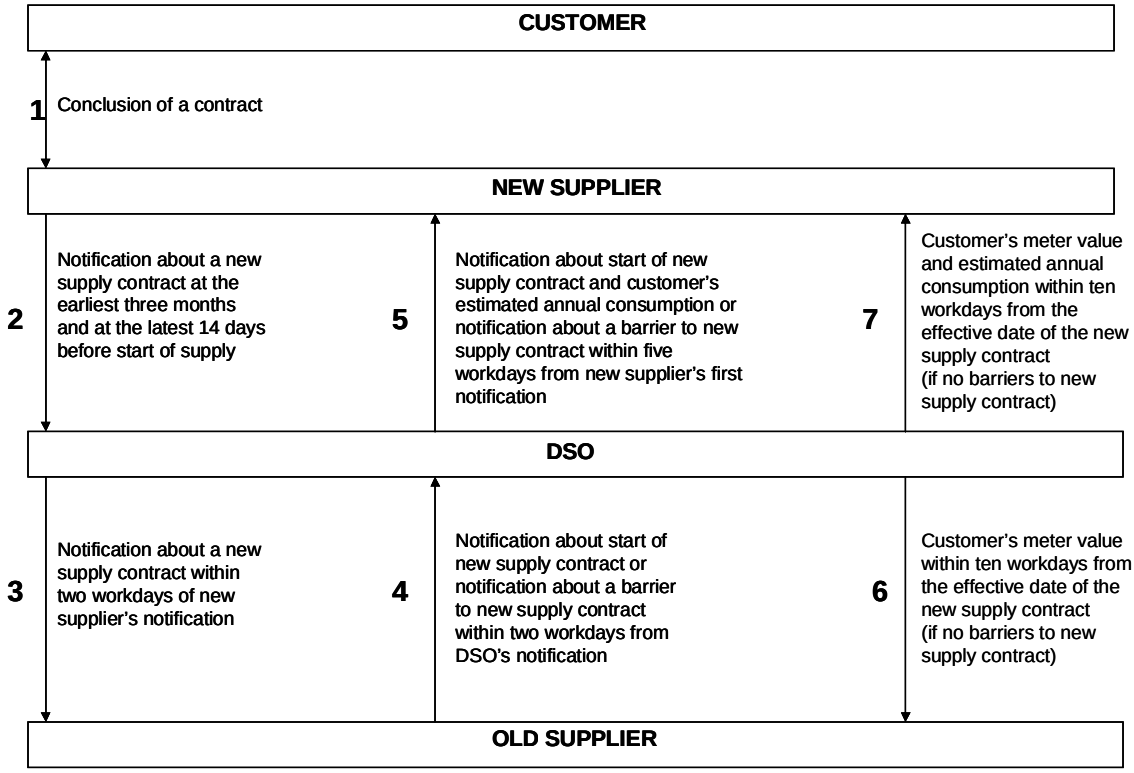

Fig. 2.1 Supplier switching process.

When the switching process is completed, the old supplier sends one more bill to the customer based on the meter value at the time of switch. After this, customer receives supply bills from the new supplier and, in most cases, separate bills for network services from the DSO.

Discussion

The supplier switching process is already simple for the customer (requires one contact only). Furthermore, the process was recently improved by new legislation that sets time limits for the suppliers' and DSO's notifications.

2.1.7 Moving

According to the recommendations given by the branch organization (ET 2009a, 2009b), the customer should be able to handle all issues related to moving with one contracting party. This party should be customer's new supplier, or the current supplier, in case the customer does not switch supplier.

The supplier that supplies the customer's new address/residence terminates customer's contract with the old DSO and notifies the new DSO about the new customer. If the customer switches supplier, the old DSO informs then the old supplier.

If the new resident chooses the same supplier as the resident who is moving out, the supplier does not have to send the DSO a separate message about the customer who is moving out. In this case, the supplier's notification about the new customer terminates the contract with the old customer.

Meters of both the old and the new address/residence have to be read; use of estimated meter values is not allowed. The meter can be read either by the customer or by the DSO. If the meter value given by the customer can not be used or if the customer can not read his/her meter, the DSO has to read the meter within five work days of the moving. The meter value is registered for the date of moving. The moving process when both the supplier and DSO change is presented in figure 2.2.

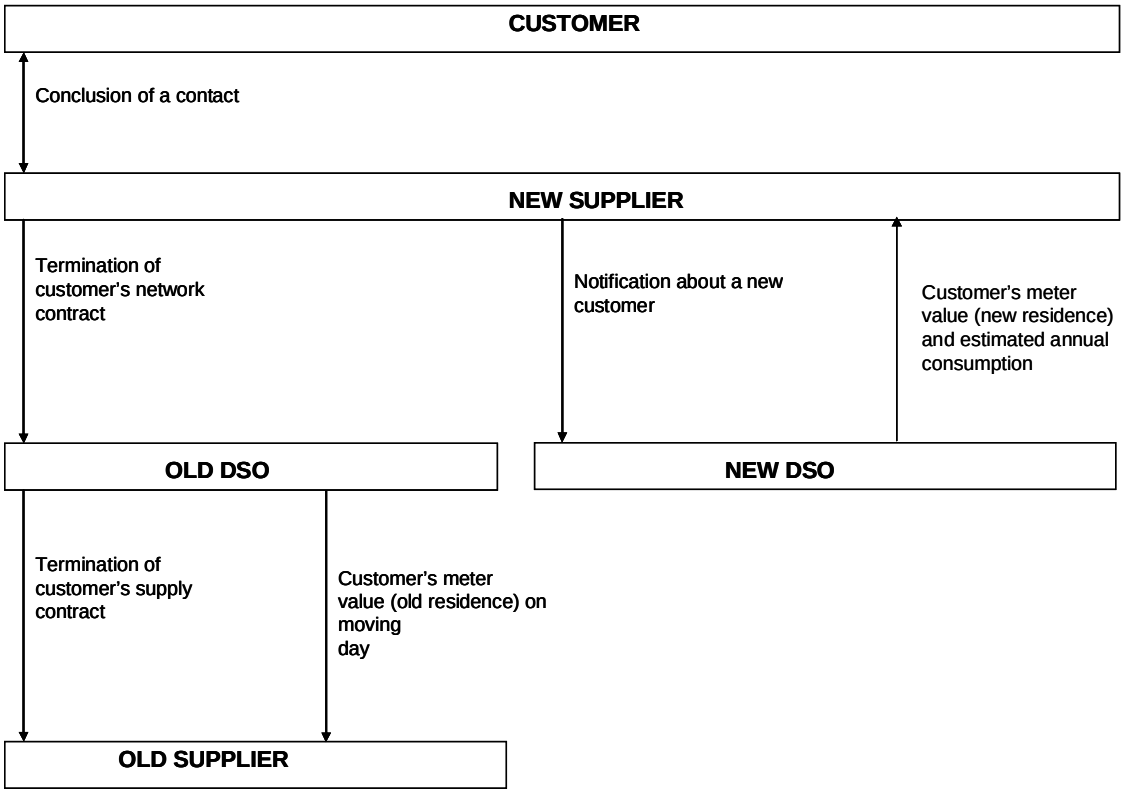

Fig. 2.2 The moving process.

Discussion

The process is already simple for the customers (requires one contact only). It may be a larger problem to remember to take care of electricity contracts in good time, since the there is much to remember when moving.

2.1.8 Quality of supply

Quality problems

If a customer complains about quality problems, the DSO is responsible to indicate that the quality complies with the standards. If the DSO can prove that the quality complies with the standards without special metering, and the customer still insists on doing them, the DSO may levy a fee for this metering if there are no quality problems (Lehtomäki 2009).

Unplanned outages

Outages are reported directly to DSOs. In many cases, the companies have a separate phone number for reporting faults and outages.

Planned outages

Notification about a planned outage must be done so that as many customers as possible who are influenced by the outage receive the information. The sufficient notification methods vary. For example, notification in the local newspaper may not be sufficient in the metropolitan area but in sparsely populated areas it may reach adequate share of the customers. In apartment house areas, bulletin boards in the stairways are often used. When only few customers are influenced by the outage they can be notified by telephone. Cards sent directly to electricity customers are also an efficient notification method. DSO must inform customers about a planned outage early enough so that the customers have possibility to prepare to the situation. Time limits are not defined or regulated in other way (Lehtomäki 2009).

Standard compensation upon outages

According to the Electricity Market Act, customers are entitled to standard compensation because of outages. The number of customers that receive standard compensation because of outages varies annually. For example in 2005, 1.6 per cent of electricity users received these compensations and in 2007 0.24 per cent (Kinnunen 2008).

According to recommendations, the standard compensations should be paid automatically to the customers without them having to ask for compensation. Many DSOs follow this recommendation (Lehtomäki 2009).

Discussion

DSO has the best knowledge of the network state and is therefore a natural point of contact in questions concerning blackouts and quality.

2.1.9 Queries

Among the most common reasons to contact supplier or DSO are issues concerning bills and paying them. These contacts can be reclamations or queries. Common reasons why DSOs receive reclamations are blackouts and quality of supply, possible disturbances caused by them, and compensation because of them. Reasons include also delivery and prices of connecting customer to the network (Lehtomäki 2009).

Customers contact the Energy Market Authority for example because of complaints or queries related to following issues (Kurkirinne 2009):

- pricing of electricity network operation and monitoring of its reasonableness
- course of action of DSOs and suppliers
- contents of the electricity bill
- asking for tenders, issues related to supplier switching, and suppliers' responsibility to report their offer prices to the Energy Market Authority's price comparison service
- determination of network value and calculations related to it
- delivery liability of the electricity network
- electricity quality
- pricing and pricing principles of electricity
- metering services of electricity

Energy Market Authority handles the complaints that it receives in writing as requests for investigation. If the complaint does not belong to the jurisdiction of the Energy Market Authority, it is transferred to the competent authority. Answering to queries is less formal and if necessary the company can be asked information related to the query for example by telephone. The customer may also be advised to make a request for investigation (Kurkirinne 2009).

If the issue does not belong to jurisdiction of the Energy Market Authority, the customer may be advised to contact the company and/or for example consumer adviser, the Consumer Disputes Board, Consumer Agency, the Competition Authority or ordinary

court. Such cases include for example individual controversial subjects between a company and a consumer, or suspicions about cartel of electricity suppliers. In case of controversial subjects, the consumer is primarily directed to settle the issue with the company, and if necessary, to contact the above mentioned authorities. These issues can be related to for example whether the company has acted according to the terms of contract. If a cartel is suspected, the consumer is advised to contact the Competition Authority (Kurkirinne 2009).

2.1.10 Debt collection

A customer who has not paid his/her electricity bill is first sent a written notification of the default on payment. If the customer does not pay the bill in spite of the reminder, his/her electricity supply may be interrupted. Electricity supply is restored after the outstanding payments have been made. Because of obligation to maintain secrecy, supplier and DSO can not exchange customer's credit information (Lehtomäki 2009). The debt collection may be transferred to a debt collection agency if the customer does not pay his/her bill even after the reminder.

Discussion

In the current retail market model, combined bills are not related to contractual arrangements but are an extra service offered by suppliers. There is also no harmonized process for combined billing. If combined billing would become common, the debt collection arrangements concerning network service fees would require consideration. Questions that would have to be taken into account include, for example, who should be responsible for the debt collection. If the supplier would have the primary responsibility, should the responsibility be transferred to the DSO at some point if the customer does not pay? Furthermore, can the supplier ask the customer for collateral also for the network service costs? This would be logical if the supplier would suffer the credit loss when the customer does not pay. On the other hand, the DSO may lose income from network service fees if a supplier, for example, goes bankrupt. Should the DSO, therefore, be able to ask for collateral from the suppliers? This could, however, easily lead to allegations of discriminatory behavior since the DSO is often affiliated to the local supplier.

2.1.11 Interruption of electricity supply

According to the Electricity Market Act, customer's electricity supply may be interrupted if the customer has not paid his bill or has in some other way breached the contract terms. Before electricity supply may be interrupted, the customer must be sent a written notification of the breach of contract, and at the earliest two weeks after sending the notification, a separate warning of cutting the electricity supply. The supply may not be interrupted before it has been five weeks since the payment has become due or since the customer was notified of another breach of contract. Furthermore, the supply is not interrupted if the customer rectifies the breach of contract before the date when the disconnection was to be made.

Electricity may not be shut off from a residential building or apartment because of default of payment between the beginning of October and the end of April, if the building is heated by the means of electricity, until four months have elapsed since the due date of the outstanding payment. Furthermore, according to the Electricity Market Act, electricity supply may be interrupted at the earliest two months after the due date if customer's payment difficulties are attributable to serious illness or some other special cause that is principally not his/her own fault.

According to the code of conduct published by the branch organization, the supplier should ask for the interruption of supply by e-mail about one week before the proposed date of interruption. If the request is made by telephone the supplier must send a confirmation which can be an e-mail, fax or Prodat message. The DSO cuts the supply on the proposed day without negotiating with the customer and bills the supplier who, after that, bills the customer. Customer's meter is also read and the DSO sends the meter value to the supplier together with confirmation about the cut (ET 2009b).

After the customer has paid his/her payments or rectified other breach of contract, the supplier asks the DSO to reconnect the customer. The supplier must also confirm this request by e-mail, fax or Prodat message. If the DSO receives the request by one p.m. the reconnection should be made the same day. Customers meter is also read and the DSO

sends the supplier confirmation about the reconnection together with the meter value by a Prodat message (ET 2009b).

The DSO may also cut the supply of electricity without a request from the supplier (e.g. when the customer has not paid his/her network service fees) (Lehtomäki 2009). According to the code of conduct, the DSO should notify customer's supplier about interruption at the latest one week after the cut was made if the customer's estimated annual consumption is less than 1 GWh. If the DSO cuts the supply of a larger customer, the supplier must be notified the following work day. The same time limits are used also for the reconnection. The notifications about the cut and reconnection are done by Prodat messages (ET 2009b).

Discussion

Interruption can be used by both the DSO and the supplier in case a customer breaches the contract terms. The DSO must react to interruption requests of all suppliers as quickly as it does to the requests of the affiliated supplier.

2.1.12 Directive on energy end-use efficiency and energy services

Directive 2006/32/EC of the European Parliament and of the council brings new duties to electricity market actors. According to the directive, member states must obligate energy distributors, DSOs and/or retail suppliers to comply with one or more of the following requirements:

a) ensure the offer and the promotion of competitively priced energy services to their final customers
b) ensure the availability and the promotion of competitively-priced energy audits and/or energy efficiency improvement measures to their final customers
c) contribute to the funds established to subsidize the delivery of energy efficiency improvement measures and to promote the development of a market for these measures

Alternatively, the member states must ensure that voluntary agreements or other market-oriented schemes with an effect equivalent to one or more of the requirements described above exist or are set up.

The directive also sets rules on metering and billing of customers. Final customers should be provided with competitively priced individual meters that provide information on customer's actual energy consumption and its time of use. Furthermore, billing should be based on actual energy consumption and performed frequently enough to enable customers to regulate their consumption. Customers should also be given information on current actual prices and actual consumption of energy, comparisons of customer's current energy consumption with consumption in the previous year and with an average or benchmarked energy user, and contact information for consumer organizations and energy agencies.

In the first drafts of implementing the energy services directive to the Finnish legislation, the obligation of giving information on customer's energy consumption in current and previous year has been set to electricity suppliers. DSOs' obligations to pass on customers' consumption data has been given in decree 66/2009 (Lehtomäki 2009).

The obligation to give customers their consumption data takes effect in the beginning of 2014. Most likely customers receive the data through user-specific web pages. The data can be sent to larger customers also by Ediel messages or in excel tables (Lehtomäki 2009).

Discussion

The law concerning energy efficiency services is currently being prepared based on the directive. Implementation of the directive to national legislations varies between countries. There are differences also in how the Nordic countries are planning to apply the directive.

2.1.13 Collection of taxes

According to the Finnish legislation (Law 1260/1996), DSOs are responsible for levying the excise duty and the supply security fee of electricity from final customers. The excise duty and the supply security fee are determined for each tax period according to the amount of electricity that the DSO distributes to final customers (cent/kWh). The amount of electricity that the DSO directly or through a supplier charges from the customers can be used as the amount of distributed electricity. The Finnish Customs is responsible for performing the excise taxation and collecting the supply security fee, and for monitoring these taxes and fees. The DSO registers as a taxpayer to the customs district to which its registered office belongs to.

Discussion

The DSO has a more permanent relationship with the customer than the supplier does. Therefore, levying the electricity tax is perhaps simpler task for the DSO in the current situation. If the billing of customers (or even the whole contractual relationship) would be handled through suppliers only, the arrangements concerning taxation may require reconsideration. The same applies to who should charge the feed in tariffs from the customers.

2.1.14 Metering

DSOs are responsible for arranging metering, registering the metering data and reporting metering data to other market participants. The metering data required in billing must be sent to suppliers consumption site specifically or metering specifically.

Meter requirements

According to a new Government decree (66/2009) metering of electricity consumption and small-scale generation has to be based on hourly metering and remote reading. The deadline for changing the meters in consumption places with main fuse larger than 3 x 63 A and for small-scale generation is December 31, 2010. For other consumption places the deadline is December 31, 2013. DSO may deviate from the requirement in 20 per cent of consumption places in its distribution network. The exception can be made in

consumption places with main fuse smaller or equal to 3 x 25 A, and in consumption places with larger main fuse in case their annual consumption is no more than 5000 kWh per year and the electricity is bought under terms of obligation to supply.

Metering devices installed to consumption sites must be capable of receiving and executing load control commands. Hourly consumption data must be stored for at least six years and information about blackouts for at least two years.

Meter reading

According to decree 66/2009, hourly registering meters have to be read once a day. Until 2012, the DSO may make an exception from daily meter reading in consumption places with a main fuse of 3 x 63 A at the most if they do not buy electricity on an hourly product. Until then, the old requirement of one meter reading per year is applied. From year 2014 onwards, other than hourly registering meters have to be read at least three times a year, and at least one of the three times has to be carried out by the DSO.

Consumption data to suppliers

The hourly data for consumption places whose main fuse is larger than 3 x 63 A must be passed on to the suppliers daily. All consumption places with larger main fuse than 3 x 63 A and that buy electricity within competition already have hourly metering. From smaller consumption places (main fuse 3 x 63 A at the most) the hourly data must be passed on daily from 2012 onwards. If such consumption place already has hourly metering and electricity supply is based on an hourly product, the hourly data must be sent already now. This is, however, a very rare combination (Lehtomäki 2009).

Consumption data to customers

According to the new decree (66/2009) concerning metering, customers are entitled to receive, without separate compensation, metering data collected by the DSO. In consumption places equipped with hourly metering, the customers must have access to the data at the same time it is ready to be handed over to customer’s supplier. The deadline for making this possible is December 31, 2013.

Discussion

Arranging metering and meter reading belong to DSOs' duties in most European countries. One of the few exceptions is the UK, where suppliers are responsible for this duty.

2.2 Differences to the supplier-centric model

Although the DSOs' role is in many ways less visible to the customer in the supplier-centric market model, customers still contact directly their DSO in some issues. Connection contracts are concluded with DSOs in most European countries regardless of which retail market model is applied. Furthermore, blackouts and problems in electricity quality are reported directly to DSOs (Annala & Viljainen 2008). Because customers need to have direct contact with their DSO, they should also know their DSO's name. In France, for example, the name of the DSO must be written in the contract between the customer and the supplier (Énergie-info 2009). Also in the UK, suppliers are obligated to keep the customers informed of their DSOs' current postal address and telephone number (Ergeg 2008).

Contracts and billing

The processes that would require the largest changes if the supplier-centric model would be applied include billing and contractual relations. In many countries, customers have a single contract that covers both electricity supply and network service. This is the case in most countries that apply the supplier-centric market model, for example France, Germany and the UK (Ergeg 2008). In these and some other European countries, customers also always receive one electricity bill that covers both the supply and the network service. In most cases, the bill is sent by the supplier.

In the supplier-centric market model, the supplier usually has a contract with the DSO unlike in the models applied e.g. in the Nordic countries. This is the case for example in France. The customer does not have to sign a contract directly with the DSO because the "DSO-supplier contract" (contrat GRD-F) covers the transportation of electricity. The responsibilities between DSOs and suppliers are defined in the contract. In May 2008, the

Standing Committee for disputes and sanctions (CoRDiS) made a decision after complaints from several suppliers that although customers do not have a written contract with the DSO, the DSO-supplier contract creates a contractual relation between the DSO and the customer (CRE 2008a). ERDF, the main DSO in France, modified its model contract with suppliers after the decision. ERDF's model DSO-supplier contract is available in the company's web page (ERDF 2008). The prices of network service are set by the regulator and approved by the government (CRE 2008).

The customers do not need a separate contract for network service in Germany either. In Germany, the suppliers conclude a supplier framework agreement with the DSO (BDEW 2008a). The industry association Bundesverband der Energie- und Wasserwirtschaft (BDEW) has published a model contract that defines the rights and obligations of suppliers and DSOs (BDEW 2008b).

According to electricity distribution and supply licenses (Ofgem 2009a; 2009b) applied in the UK, all suppliers and DSOs must be parties to and comply with the Distribution Connection and Use of System Agreement, DCUSA. The DCUSA is a multilateral contract which was established in 2006 to increase transparency in competitive electricity markets. It replaced numerous bilateral contracts between electricity suppliers and DSOs. Because DSOs have different Use of System Charges, they are not defined in the DCUSA but are set out in a charging statement that all DSOs are required to have in place. DSOs must also inform the suppliers about a change of charge by sending a written notice (Wragge & Co 2006).

Customer service

Large share of Finnish companies/groups that act both as suppliers and DSOs already have shared customer services. The changes in customer service arrangements would, however, concern also these companies since the suppliers would handle customer service duties on behalf of also other than the local DSO. For example, queries concerning billing could be handled by the supplier's customer service if customers

always receive a bill from the supplier only. To be able to handle these and other queries massive changes in the suppliers' databases would be required.

The DSOs must, however, also have some customer service resources since DSOs are responsible for giving advice to customers who wish to connect to the distribution network, and contracting on network connection is DSOs' duty in most European countries (Annala & Viljainen 2008).

Furthermore, customers issue their queries about quality of supply or outages directly to the DSOs in most European countries including Finland (Annala & Viljainen 2008). However, at least in the UK, the customer may contact also the supplier in case of a blackout. The supplier will then provide the necessary information or put the customer in contact with the DSO (Ergeg 2008).

If the supplier-centric market model would be applied, it should be considered how the customers would be informed about the DSOs contact details. One option would be to include this information on the bill. To enable this, the information should be included in the supplier's billing database. Another possibility would be to establish a service center to which customers of all DSOs could contact.

Debt collection and credit risks

The practices concerning debt collection are also very different in Finland compared to many countries that apply the supplier-centric market model. Suppliers are responsible for the debt collection of delayed network service payments in most countries that apply the supplier-centric model (Annala & Viljainen 2008).

In Finland, customers pay for their consumption afterward; prepayment meters are not used (and are not likely to be introduced). If suppliers are required to pay the network service fee to the DSO even if customer does not pay his/her bill, customers' payment defaults may form a risk especially to small suppliers. On the other hand, suppliers' financial difficulties and possible payment defaults are a risk for the DSOs.

A report by the Irish Commission for Energy Regulation (CER 2005) approached three preventative measures that suppliers could use in customer debt management:

- security deposits
- direct debiting
- prepayment meters
- external customer register

Security deposits could possibly be charged as means of encouraging customers to avoid the build-up of arrears. Customers' willingness to pay in advance of use is, however, questionable, and also other problems are related to this measure. Suppliers could also use an external customer register to maintain payment records for all customers. This register could be consulted before offering a contract to a customer (CER 2005).

Prepayment meters are used for example in the UK. These meters require payment of electricity to be made in advance of use or supply is prevented. About 16 per cent of British domestic energy consumers (includes both gas and electricity) use prepayment as their form of payment whereas direct debit is used by 43 per cent of domestic customers (Ofgem 2008a).

In the UK, DSOs are allowed to require collateral for network operator costs from the suppliers (Ofgem 2008a). The collaterals are, however, considered burdensome by small suppliers.

Metering

DSOs are in charge of metering in most European countries; metering is typically a DSOs' duty also in the countries that apply the supplier-centric market model. The main exception from this is the UK, where the metering market is liberalized and suppliers are responsible for metering (Annala & Viljainen 2008). The suppliers must provide the DSOs with meter data that they need in the calculation of use of system charges and in the operation, design and planning of their network (Wragge & Co 2006).

The Dutch metering market was also liberalized (Vasconcelos 2008). However, after some time, the metering was made regulated activity with regulated tariffs. There were also plans for making smart meters obligatory for all customers. The smart meters were to be provided and maintained by DSOs. Collecting and processing of meter data and communicating it to the customers was to be appointed to suppliers (Frontier Economics 2008). The smart meters remain, however, voluntary because consumer organizations complained about privacy problems related to smart meters (Heck 2009).

Connections

DSOs are in most European countries responsible for giving advice for customers wishing to connect to the distribution network. Furthermore, contracting on network connection is commonly a DSOs' duty regardless of the retail market model applied (Annala & Viljainen 2008). Therefore, this process would not require changes if the market models applied in Europe would be harmonized.

Supplier switching

Customers need to contact only one party in order to switch supplier in most European countries. According to the recommendations given by the branch organization, also the Finnish customers should be able to contact only the new supplier. The switching procedure described in the recommendation resembles to for example the procedure used in France where the supplier-centric market model is applied. Also in France, the customer contacts only the new supplier who then contacts the DSO. The old and the new supplier do not need to be in contact since the DSO then contacts the old supplier (CRE 2008b).

Collection of taxes

There are differences in tax collection even in the countries that apply the same basic market model. For example, Sweden is the only Nordic country in which the electricity tax is levied by suppliers. In the other Nordic countries this is DSOs' duty. A survey answered by 16 European energy regulators indicated that there is no uniform practice concerning tax collection. The electricity tax is levied by suppliers in nine respondent

countries and by DSOs in six countries. In one country, electricity tax is not levied from final customer (Annala & Viljainen 2008).

2.3 Possible problems

Number of DSOs

The high number of DSOs in the Nordic countries should be considered carefully if the supplier-centric model would be applied. The number of DSOs in the Nordic countries is presented in table 2.1.

Table 2.1Number of DSOs in the Nordic countries.

Country	Number of DSOS
Denmark	101 [a]
Finland	89 [b]
Norway	159 [c]
Sweden	170 [d]

[a] Danish Energy Regulatory Authority
[b] Finnish Energy Market Authority
[c] Norwegian Water Resources and Energy Directorate
[d] Energy Markets Inspectorate

The number of DSOs is considerably lower in many European countries. In France, for instance, one company undertakes 95 per cent of the electricity distribution (CRE 2008b). In the UK, there are 18 licensed electricity distributors (Ofgem 2008b). On the other hand, in Germany, the number of DSOs is approximately 900 (BDEW 2008a).

Network service fees

Also the variation of network service fees in the Nordic countries is large because of DSOs' different operating environments. Table 2.2 presents the average, lowest and highest annual network service costs and the average energy cost for two typical customer groups in Finland. K1 refers to a customer who lives in an apartment house and consumes 2000 kWh per year (no electric sauna stove, main fuse 1x25A). L1 refers to a customer living in a detached house with electric heating and who consumes 18000 kWh

per year (main fuse 3x25A). The average energy cost shown in the table is the average of prices within obligation to supply. The annual costs were calculated with the help of price statistics of the Finnish Energy Market Authority (EMA 2009a; 2009b). The prices used in the calculations were valid on January 1, 2009.

Table 2.2 Annual network service fees and energy cost for two typical customers (Finland).

	K1 euros/year	**L1 euros/year**
Average network service fee	130	718
Lowest network service fee	78	365
Highest network service fee	201	1030
Average energy cost	163	1127

The average share of network service fee of the total electricity cost is 44 per cent for the customer type K1 and 39 per cent for the customer type L1. The highest network service fee for the customer type K1 is over two and half times the lowest fee. For customer type L1, this ratio is almost three. In the UK, for example, the share of network service fee of the total electricity cost is smaller, typically one fifth of a household customer's bill (Ofgem 2009c).

2.4 Nordic industry's opinions about retail market models

This chapter approaches the Nordic industry's view on the different retail market models and their effects on competition in the electricity retail markets. Opinions about the supplier-centric market model, and the model in which DSO's role is more visible (as in the Nordic countries) were asked from a selected group of Nordic electricity suppliers, DSOs and electricity industry associations that were familiar with the basic features of the different models. The inquiry was answered by eleven persons. There were responses from all Nordic countries (except for Iceland). Because the number of respondents is low, some views may not be presented. Furthermore, no generalization can be made about which model the Nordic industry would prefer.

The inquiry included questions concerning the positive and negative features of the two market models presented in figure 2.3. Model I is referred as the model that accentuates the different roles of supplier and DSO, and model II is referred as the supplier-centric model.

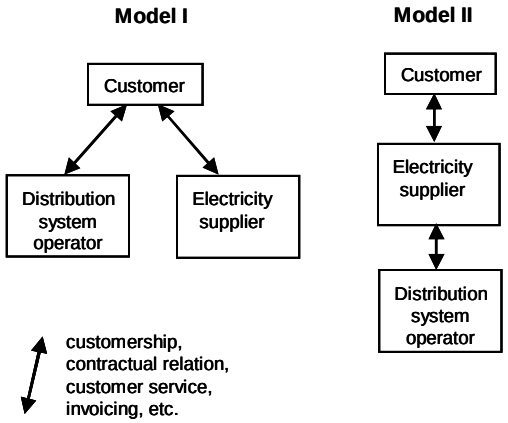

Figure 2.3 Simplified retail market models.

In addition, the respondents were asked to evaluate the competitive position of independent suppliers in the models currently used in the Nordic countries, and to consider how the supplier-centric model would affect their position.

Ten respondents considered that the supplier-centric model is easier to understand for the customers. Only one respondent disagreed. However, eight respondents were of the opinion that the model that accentuates the different roles of suppliers and DSOs is better in facilitating market access. Only one respondent considered that the supplier-centric model facilitates market access best. The respondents gave diverging answers to the question on which model they would prefer if the models were harmonized (Annala & Viljainen 2009).

A majority of the respondents found the model that accentuates the different roles of suppliers and DSOs easier for new suppliers. Many respondents mentioned that it is easier also for old suppliers and DSOs, especially since the number of market participants is high in the Nordic countries. Furthermore, in this model, the supplier does not need as

heavy data systems as in the supplier-centric model. According to the respondents, a drawback of the model that accentuates the different roles is that it is more complicated for the customer because the customers do not always understand the differing roles of a supplier and a DSO and may see electricity as one service. Customers may also see the separate electricity bills and contracts as a negative thing (Annala & Viljainen 2009).
According to the respondents, the most important advantage of the supplier-centric model is its easiness to the customers as they only have to contact one party, have one legal relationship and receive one bill only. A drawback is that it is thought to require a lot from the supplier, for instance heavy data systems, a lot of data transfer with the DSO, and knowledge of all the network tariffs. Therefore, it may make market access more difficult for new suppliers. The high variation of network service fees can also mean that marketing has to be aimed according to the customer's network area, if the costs of electricity supply and network service are always shown bundled. Furthermore, in the supplier-centric model, suppliers face problems if customers fail to pay their bills, as the suppliers pay the network fee to the DSO. One respondent even stated that the supplier-centric model probably leads to a market with only a few suppliers. Both models were criticized for confusion about market participant's roles. Furthermore, two respondents mentioned that the ideal model would be something between the two models. However, their opinions about which model should be used as the basis for the new model diverged (Annala & Viljainen 2009).

Most respondents did not consider the competitive position of independent suppliers distinctly worse than that of suppliers affiliated to DSOs. Naturally, since the affiliated suppliers are normally old incumbents, they already had a natural customer base when the market was opened. Furthermore, the affiliated suppliers may have lower operational costs because they can for instance have a shared customer service with the DSO. Competitive position of suppliers without own power generation relies strongly on the functioning and transparency of the wholesale market. Respondents' opinions about easiness of risk management in the wholesale market differed. Independent suppliers have also had difficulties to compete with pricing policies of some suppliers with own power generation; sometimes the retail prices have been lower than the wholesale prices.

Four respondents stated that independent suppliers do not have major barriers for market access. One of them added, though, that it would be easier if the market processes would be more harmonized in the Nordic countries. Five respondents mentioned problems in market access. These were related to lack of harmonized market rules/processes, required capital, the costs of brand building and the difficulty of having competitive pricing and too low profit margins. Most respondents thought that applying the supplier-centric model would make independent suppliers' position worse because it would for instance require massive system investments. One respondent stated that the supplier-centric model is problematic for all suppliers (independent or affiliated to DSOs) in the Nordic countries because of the high number of DSOs in all countries. Only one respondent considered that the supplier-centric model would make market access and operating in the market easier for independent suppliers (Annala & Viljainen 2009).

3 Customers' experiences of open electricity market

This chapter examines customers' experiences in open electricity markets; for example the fluency of supplier switching process. The information is based on the following customer surveys:

Consumer survey of the Finnish Energy Industries & Innolink Research (Innolink Research 2005)

- The survey was carried out in summer 2005
- The results are based on phone interviews answered by 1000 randomly selected Finnish consumers

Consumer survey of the Finnish Energy Market Authority (EMA 2008)

- Survey was carried out in November and December 2008
- It was answered by 3117 Finnish consumers aged 18 to 64 (response rate 16 %)
- Invitation to the web-based inquiry was sent by e-mail
- 28 per cent of the respondents have switched electricity supplier

Energy Companies – Service survey 2008 (Adato Energia 2008)

- The inquiry was answered by Finnish 5480 consumers
- The survey was done in 2008

Switching behavior in electricity markets (Hernesniemi 2007)

- The survey was carried out by interviewing 100 Finnish consumers that had switched electricity supplier before February 2006 (for reason other than moving)
- The interviews were done by telephone
- 14 of the respondents have switched supplier more than once

Households' switching behavior between electricity suppliers in Sweden (Ek & Söderholm 2008)

- The results are based on a postal survey done in November (December) 2005

- The questionnaire was sent to 1200 randomly selected Swedish households of whom 536 answered the questionnaire
- 30 per cent of the respondents live in apartments (lower than Swedish average) and the majority in their own houses

Energy supply probe (Ofgem 2008a)

- The survey was carried out in 2008
- The respondents are British consumers

3.1 Available information on open electricity markets and prices

Finnish customers receive information about supplier switching and electricity prices from (EMA 2008):

- the media (television, radio, newspapers/magazines) 60.9 % (3.24)
- energy companies 32.7 % (3.22)
- other web-based price comparison services 27.9 % (3.76)
- sähkönhinta.fi service (price comparison service of the Energy Market Authority) 20.5 % (4.03)
- Other 7.8 % (3.69)
- Energy Market Authority 4.6 % (3.70)
- Other Authorities 1.6 % (2.96)

The figure in the parentheses is the average of answers to question “do you get enough information about supplier switching and electricity prices” from the parties mentioned. The adequacy of information was estimated on scale from one to five, in which one equaled disagree entirely and five agree entirely.

Almost half of the respondents that had used the price comparison service of the Energy Market Authority had found an offer with lower price than their existent contract. However, only 52.5 per cent of these respondents had switched supplier based on this (EMA 2008).

The majority of respondents of Hernesniemi's survey (Hernesniemi 2007) considered information search related to supplier switching easy. Most of the respondents also said they had found enough information. However, these results were received from consumers who had switched supplier; those who have not could have given different responses.

3.2 Experiences of supplier switching

Most (69) of the respondent's of Hernesniemi's survey had made the first contact to the new supplier themselves. 25 were contacted by the new supplier either by mail, telephone or a personal supplier (Hernesniemi 2007).

When the respondents of the Energy Market Authority's survey that had switched supplier were asked about the ease of supplier switch, 41 per cent agreed entirely with the proposition "supplier switching goes along easily". 44 per cent of the respondents somewhat agreed and only 1.27 per cent disagreed entirely (EMA 2008).

3.3 Opinions about market functioning

The respondents of the Energy Market Authority's survey (EMA 2008) were also asked to evaluate the functioning of electricity market on a scale from one to five in which one corresponds to disagree entirely and five agree entirely. Averages of responses related to market functioning are presented in table 3.1.

Table 3.1 Consumer's responses to questions concerning market functioning.

	Average of responses
Electricity market functions well	2.88
There is enough competition between electricity suppliers	2.79
Electricity distribution fees are adequately regulated	2.47
Electricity distribution fees are reasonable	2.18

3.4 Selection criteria and reasons for not switching

Table 3.2 presents what the respondents of the Energy Market Authority's survey consider the most important selection criteria for electricity suppliers.

Table 3.2 Most important selection criteria for electricity suppliers (EMA 2008).

	Most important	2nd
Price	79 %	11.5 %
Means of production	7.9 %	36.1 %
Local supplier	5.9 %	14.5 %
Quality of customer service	5.8 %	34.2 %
Other	1.3 %	3.8 %

The price has been named as the most important reason to switch in many consumer surveys. 80 per cent of the respondents of the consumer survey made in summer 2005 that had switched supplier said they switched because of price (Innolink Research 2005).

89 respondents of the survey done to 100 consumers who had switched supplier named electricity price as the most important reason to switch supplier. Many of the other respondents told that company's bad reputation or bad experience of customer service together with the price had triggered the switch. Although lower price is the most common reason to switch supplier, only one of the respondents could say the actual amount of money saved by switching (Hernesniemi 2007).

Some customers also say they wish to buy electricity from the local company. Table 3.3 shows consumers responses to question about how important it is for them to be customer of the local supplier (Adato Energia 2008).

Table 3.3 Significance of the local supplier to the consumers.

	Percentage of respondents
It matters very much	27 %
It matters rather much	38 %
It has some importance	24 %
It has no importance	11 %

Since the price is the most important reason to switch supplier, it is not surprising that the insignificance of the benefit achieved by switching is another typical reason for not switching. Furthermore, customers who find comparing suppliers or prices difficult are less likely to switch. A large share of customers has not really done a decision to switch or to not switch. They may not be interested, not have time, or are not aware of the possibilities (Pakkanen & al. 2008).

Table 3.4 presents the reasons why the respondents of the consumer survey done in summer 2005 have not switched or renegotiated contract with their existent supplier (Innolink Research 2005).

Table 3.4 Reasons for not switching or renegotiating (Innolink Research 2005).

	Percentage of customers
Do not have time	29.9 %
Has not come to mind	27.8 %
It seems difficult	22.6 %
The benefits seem small	21.5 %
Separate invoice after switching	1.0 %
Problems/risks related to two service providers	1.5 %
Local supplier is important	4.7 %
Other	11.5 %

The results of table 3.4 could be different today since for example the price comparison service of the Finnish Energy Market Authority was not established when the interviews were made.

3.5 Customer surveys from other countries

A study by Ek & Söderholm (2008) analyzes the factors that promote and prevent customer activity among Swedish households. About 30 per cent of the respondents had changed supplier and about 25 per cent had renegotiated the contract with their existing supplier during the last five years.

Over one-third of the respondents had used Internet services to compare offers from different electricity suppliers. However, only two per cent of the suppliers told they had contacted other than their existing supplier during the last year.

Some responses that may explain differences in households' activity are presented in table 3.5.

Table 3.5 Some results of a Swedish consumer survey (Ek & Söderholm 2008).

	Disagree entirely %	**Partly disagree %**	**Uncertain %**	**Partly agree %**	**Agree entirely %**
It is difficult to know how offers from different electricity suppliers would affect the size of my electricity bill.	5	7	23	33	32
I have large confidence in my present electricity supplier.	5	12	43	29	11
I have large confidence in other electricity suppliers.	10	20	62	7	1
I cannot affect the size of my electricity costs by changing electricity supplier.	13	19	33	26	10
It is time consuming to search for information about offers from other electricity suppliers.	5	10	23	33	29
The deregulation of the electricity market was a good measure.	28	13	39	12	10
It is important to be able to choose between different electricity suppliers.	6	6	19	23	46

In general, households have more confidence in the existing supplier than in alternative suppliers. Furthermore, customers find searching for information rather burdensome and consider comparing the offers difficult.

According to a survey on British customers, almost all consumers (96 per cent) know that they can switch energy supplier. 70 per cent of consumers also feel confident that they know how to do it. Saving money is also the British customers' main incentive to switch supplier. It was stated as a main reason to switch by four fifths of the consumers surveyed. Over half of the switches by consumers were initiated by a direct approach by a sales person from a supply company. In the UK, dual fuel contracts that combine electricity and gas supply have an important role; most of the customers connected to the gas network choose this kind of contract if they switch supplier (Ofgem 2008a).

4 Customer service inquiry

Customer service arrangements, expectations towards customer service, and customer service personnel's views on how well customers understand the functioning of electricity markets were approached by sending an internet based questionnaire to people working in customer service duties in electricity companies. Link to the questionnaire was sent via member database of the Finnish Energy Industries. The questionnaire received 23 responses. In practice, the responses represent views of larger number of people, since many answers came from a group of respondents. One of the respondents does not work in customer service duties and therefore answered only to the questions concerning customer service arrangements.

Two of the respondents work in companies that act only as suppliers, and one in a company that acts only as a DSO. The other 20 respondents work in companies that act both as suppliers and DSOs. The unbundling requirements concerning these companies are presented in table 4.1.

Table 4.1 Unbundling requirements of the vertically integrated companies.

Accounting separation	9
Legal separation	3
Operational separation, at least 50 000 customers	3
Operational separation, at least 100 000 customers	2

4.1 Customer service arrangements

19 of the 20 respondents whose company/group acts both as a supplier and a DSO work in a shared customer service. Only one of the companies/groups that the respondents represent, has separate customer services for supply and network branches. The respondent from this company/group works in the network branch's customer service.

4.1.1 Suppliers' and DSOs' shared customer services

The customer service is most often placed under supply activity in the company/group organization. Only two companies place the shared consumer service under network activity. In eight companies it belongs to group services.

Table 4.2 Placement of customer service in the concern organization.

Supply activity	9
Network activity	2
Group services	8

Respondents' estimations, about how large share of contacts is related to supply and how large share to network service, varied. On average 61 percentage units of the contacts were related to supply and 39 to network service. The lowest estimation for contacts related to supply was 25 per cent of all contacts and the highest 80 per cent.

15 respondents told that customers are sometimes guided to contact directly to supply or network branch. Such cases include:

- large invitation for tenders, or other questions by large customers
- questions related to connections (e.g. building a new connection)
- debt collection
- issues concerning metering
- specific queries concerning price
- technical issues
- interpretation of contract and disagreement about contract terms
- billing
- issues that require confidentiality

4.1.2 Fault situations

Nineteen of the 21 respondents that work in a shared customer service or in a DSO's customer service told they have a separate phone number for fault situations. Table 4.3 shows where the customers find the number.

Table 4.3 Information about phone number for fault situations.

Company's web page	21
Electricity bill	10
Electricity contract	5
Other	9

The other mentioned places to find the number included the phone book (six respondents), telephone answering machine of the customer service (when the customer service is closed), confirmation notification (of a concluded contract) and in the advertisement of the company. Only two respondents work in companies that do not have a separate number for fault situations. One of these companies has a shared customer service and one a separate customer service for supply and network branches.

4.1.3 Energy efficiency services

All respondents were asked about whether their company offers energy efficiency services and if so, what kind of services. Eleven respondents told that their company offers energy efficiency services. Most often these services are giving advice on energy use and saving. The companies for example, give information about household appliances and electricity use. Other services included lending of meters, reports on customers' consumption, and information on company's web page.

4.2 Customer contacts

Table 4.4 presents customer service personnel's estimation, about how often an average customer, contacts customer service.

Table 4.4 Average of how often a customer contacts customer service.

More than once a year	3
Once a year	8
Less frequently	11

Issues concerning billing are the most frequent reasons why customers contact the customer service. Both billing and contracts were mentioned as the most frequent reason for contact by seven respondents. Billing was, however, mentioned in the top five more

frequently. The most typical reasons to contact customer service and the number of respondents that mentioned the reason in top five are presented in table 4.5.

Table 4.5 Typical reasons to contact customer service and their frequency.

Reason for contact	**Number of respondents that mentioned the reason in top five**
Billing	20
Contracts	12
Payment deadlines	9
Moving	8
Supplier switching/invitation for tenders	7
Meter values	6
Connections	6
Price queries	4

Most often the respondents mentioned the billing in general but some also said the customers ask about contents of the bill. Payment deadlines are also related to billing as customers often contact the customer service to negotiate about the due dates of bills. Issues related to contracts included making and ending of contracts, and changing the contract terms.

The other reasons to contact customer service included e.g.

- fault situations
- issues concerning metering (other than meter values)
- environmental issues and energy saving
- electric installations
- different customer loyalty schemes

Respondents were also asked about how large share of customer questions can be taken care of with one contact. The lowest answer was 70 per cent, and the highest 99 per cent. Average of all answers was 87 percentage units. Most typical issues that require more than one contact are

- issues related to connections and constructions
- unclarities in metering

- unclarities in billing
- reclamations

4.3 Quality of customer service

The success of customer service is often evaluated by the time to answer phone calls and by the results of customer surveys. The answering time is used as an indicator in about half of the companies that the respondents represent. The response rate of calls is also used in some companies. In addition to answering time, half of the companies evaluate the success of customer service by customer satisfaction surveys. The frequency of such surveys varies; some companies do surveys once a year, some twice a year and some four times a year. Customer feedback received outside of special surveys is naturally also used.

4.4 Expectations towards customer service

According to the respondents, their employers expect that customer service personnel answers customer contacts rapidly. Some companies also have target values for response rate of phone calls. Furthermore, employers expect that the majority of issues are handled with one contact. Customer service is expected to be efficient, fast, friendly, competent, easy to reach, and to give positive image about the company. Naturally, employers aim for high customer satisfaction.

Employers' other expectations toward customer service included for example.:

- accurate billing
- complying with the indiscrimination principles
- use of new technology (remote connections/disconnections, developing of web services)

One respondent stated that employer's expectations towards customer service are two high, and for the customer service to function better, other problems in the industry should be solved.

16 respondents considered they get enough support from their employer to successfully manage the customer service duties, while three felt that they do not get enough support. Also some of the respondents that felt they get enough support highlighted the importance of training. One respondent told that he/she would like more training on nondiscrimination and its significance and one on sending e-mails. One hoped for more recourse for customer service and also another respondent told the customer service is sometimes congested. One hoped that the work situation and job contents would be talked through more often and that the information flow between own department and other departments and units would be better.

When the respondents were asked about what kind of expectations the customers have towards the customer service, competent, quick and friendly service were highlighted. Some respondents also mentioned that customers wish they could contact only one party in electricity issues.

4.5 Suppliers' and DSOs' roles – customer view

20 respondents told that they have to explain the customers the differences between electricity suppliers' and DSOs' roles and duties. Only two answered no to this question. Respondents' opinions about how well the customers understand the division of duties in electricity retail market is presented in table 4.6.

Table 4.6 Customer service personnel's opinions about how the customers understand the difference between electricity supply and network service.

Well	0
Rather well	1
Rather poorly	14
Poorly	7

Customer service staff was also asked about what are the most difficult issues for the customers to understand in electricity market. Also this question highlighted that customers still have problems in understanding the separation between electricity supply

and distribution. Especially separate bills and contracts after supplier switch were mentioned by many respondents, as well as supplier switching in general.

Furthermore, the reasons for changes in electricity prices are not simple to understand. Some customers are also confused with the different components of the bill (supply, distribution, taxes). Equalization bills are especially difficult to understand. Consumers may not also know how their consumption is formed. In general, consumers have more difficulties understanding the electricity markets, the commercial customers are more familiar with the market functioning.

5 Conclusions

Applying the supplier-centric market model in Finland would require large changes in the retail processes. Contracting and billing are the processes that would experience the largest changes.

If suppliers would be in contractual relation with the DSO, forming of standard contract should be considered because managing separate contracts with differing contract terms with each supplier/DSO may be burdensome.

The number of DSOs is rather high in Finland, and because of differences in their operating environments the variation of network service fees is large. Therefore, notification methods on change in network service fees require consideration. According to Finnish legislation, customers must be informed about a change of supply or network service fee one month in advance, and the notification must be done directly to the customer's invoicing address. Some suppliers have complained that this is a too costly method. Therefore, it should be considered carefully, who should notify the customer about the change in network service fee. Another issue is how the DSO should notify the supplier about its prices. Should this be done by mail or by using for example Prodat messages? One possibility would be to even harmonize the network service fees.

Some processes would not require actual changes; for example the recommendations for supplier switching process are already similar to the switching practice applied in the supplier-centric market model. Furthermore, customers contact directly to the DSOs in issues related to for example electricity quality and connections also in the countries that apply the supplier-centric market model.

If the supplier-centric market model would be applied the influences to risk management and debt collection should be inspected carefully. Requirements for collaterals from suppliers would reduce DSOs' risks related to suppliers' financial difficulties. On the

other hand, these kinds of requirements could form an entry barrier to small suppliers who face also other large costs when entering a new market.

Consumer surveys often give a more positive image about how well the customers understand the functioning of open electricity markets and how easy the switching is for consumers than the inquiry made to customer service staff. One reason for this may be that the customers who are already interested in these issues may be more likely to answer the surveys, whereas customer service is perhaps contacted more often in problem situations. An average customer also contacts the customer service rather seldom.

6 References

(Adato Energia 2008) Adato Energia. 2008. Energiayhtiöt – Palvelututkimus 2008 [Energy companies – Service study] (in Finnish).

(Annala & Viljainen 2008) Annala, S. & Viljainen, S. 2008. Electricity retail markets in Europe – division of duties between suppliers and DSOs. [Online]. [Accessed March 18, 2009]. Available: http://www.energia.fi/fi/julkaisut/retail%20market%20models_report%202008.pdf

(Annala & Viljainen 2009) Annala, S. & Viljainen, S. 2009. Electricity Retail Market Models in Nordic Countries – Need for Changes? 6th International Conference on the European Energy Market – EEM09.

(BDEW 2008a) Bundesverband der Energie- und Wasserwirtschaft e.V. 2008. Guideline on Market Access for new Market Participants. [Online]. [Accessed May 24, 2009]. Available: http://www.bdew.de/bdew.nsf/id/DE_Datenaustausch_und_Mengenbilanzierung_DuM/$file/2008-12-18_Leitfaden-Marktzugang-neue-Markteilnehmer_GB_end.pdf

(BDEW 2008b) Bundesverband der Energie- und Wasserwirtschaft e.V. 2008. Aktualisierte Formulierunshilfe für einen Lieferanten- Rahmenvertrag zur Netznutzung zum Zwecke der Belieferung von Kunden im Netz des Verteilnetzbetreibers (VNB) mit elecktrischer Energie zwischen Verteilnetzbetreiber und Stromlieferant [Updated formulation help for a supplier framework agreement

between DSO and supplier] (in German). [Online]. [Accessed June 1, 2009]. Available: http://www.bdew.de/bdew.nsf/id/8693C2F6BA882A57C12573C50044FD9A/$file/Muster_2007-12-19_Lieferantenrahmenvertrag_Aktualisierung_endg.pdf

(CER 2005) Commission for Energy Regulation. 2005. Management of Customer Payments & Arrears – Report on the Consultation and Decision Paper CER/05/060. [Online]. [Accessed June 4, 2009]. Available : www.cer.ie/GetAttachment.aspx?id=bdaee56f-b2a4-4f3d-bb28-e0bebae51e4f

(CRE 2008a) CRE. 2008. La lettre de la Commission de régulation de l'énergie (mai/juin 2008) [Letter of the Energy regulatory commission] (in French). [Online]. [Accessed June 1, 2009]. Available: www.cre.fr/fr/content/download/7627/138055/file/9_Decryptages.pdf

(CRE 2008b) CRE. 2008. Report sent to DG Tren – July 2008. [Online]. [Accessed April 7, 2009]. Available: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20reporting%202008/NR_En/E08_NR_France-EN.pdf

(Decree 809/2008) Decree 809/2008 of Ministry of Employment and the Economy. [Online]. [Accessed June 4, 2009]. Available: http://www.finlex.fi/fi/laki/alkup/2008/20080809

(Decree 66/2009) Government decree 66/2009. [Online]. [Accessed June 2, 2009]. Available: http://www.finlex.fi/fi/laki/alkup/2009/20090066

(Directive 2006/32/EC) Directive 2006/32/EC of the European Parliament and of the Council. [Online]. [Accessed June 5, 2009]. Available: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:114:0064:0064:EN:PDF

(EC 2007) Commission of the European Communities. 2007. Proposal for a directive of the European Parliament and of the Council amending Directive 2003/54/EC concerning common rules for the internal market in electricity. [Online]. [Accessed February 11, 2009]. Available: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0528:FIN:EN:PDF

(Ek & Söderholm 2008) Ek, K. Söderholm, P. Households' switching behavior between electricity suppliers in Sweden. Utilities Policy 16 (2008), p. 254-261.

(Electricity Market Act) Electricity Market Act 386/1995. [Online]. [Accessed June 5, 2009]. Available : http://www.emvi.fi/files/sahkomarkkinalaki_386-1995.pdf Unofficial translation available: http://www.emvi.fi/files/electricity_market_act_20050128.pdf

(Énergie-info 2009) Énergie-info. 2009. Obligations de fournisseurs [Suppliers' obligations] (in French). [Online]. [Accessed May 22, 2009]. Available: http://www.energie-info.fr/mes-droits/obligation-fournisseurs

(EMA 2008) Energy Market Authority. 2008. Kuluttajatutkimus 2008 [Consumer survey 2008] (in Finnish). [Online]. [Accessed April 1, 2009]. Available: http://www.emvi.fi/files/Kuluttajatutkimus_2008.pdf

(EMA 2009a) Energy Market Authority. 2009a. Sähkön siirron yhtiökohtaiset keskihinnat tyyppikäyttäjittäin 1.1.2009 [Prices of electricity distribution as at January 1, 2009] (in Finnish). [Online]. [Accessed February 11, 2009]. Available: http://www.emvi.fi/files/Skh_0901.xls

(EMA 2009b) Energy Market Authority. 2009b. Sähkön hinnan kehitys 1.1.2009 [Development of the electricity price until January 1, 2009] (in Finnish). [Online]. [Accessed February 11, 2009]. Available: http://www.emvi.fi/files/Kehitys0901.xls

(Energiekamer 2008) Energiekamer. 2008. 2008 National Report Office of Energy Regulation (The Energiekamer) to the European Commission. [Online]. [Accessed March 18, 2009]. Available: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20reporting%202008/NR_En/E08_NR_Netherlands-EN.pdf

(ERDF 2008) ERDF. 2008. Contrat GRD-F [The DSO-supplier contract] (in French). [Online]. [Accessed June 1, 2009]. Available:

http://www.erdfdistribution.fr/electricite-reseau-distribution-france/fournisseurs-d-electricite/relations-contractuelles/dispositif-contractuel-130086.html

(Ergeg 2008) Ergeg. 2008. Transposition of Consumer Rights Monitoring Report. [Online]. [Accessed April 2, 2009]. Available: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_ERGEG_PAPERS/Customers/2008/E08-CPR-20-03_Consumer%20rights%20monitoring_2008-10-13.pdf

(ET 2005) Finnish Energy Industries. 2005. Energiateollisuus ry:n suosittelemat sähkönkäyttöpaikkojen liittymisen ehdot (Liittymisehdot, LE 05) [Terms of connection recommended by the Finnish Energy Industries] (in Finnish). [Online]. [Accessed April 29, 2009]. Available: http://www.energia.fi/content/root%20content/energiateollisuus/fi/s%C3%A4hk%C3%B6/koti%20ja%20s%C3%A4hk%C3%B6/s%C3%A4hk%C3%B6sopimukset/liitteet/liittymisehdot%20le05.pdf?SectionUri=%2Ffi%2Fsahko%2Fkotijasahko%2Fsahkosopimukset

(ET 2009a) Finnish Energy Industries. 2009. Sanomaliikenteen menettelyohje – Prodat ja Aperak versio 1.4 – 18.3.2009 [Code of conduct of message communications] (in Finnish). [Online]. [Accessed May 5, 2009]. Available: http://www.energia.fi/content/root%20content/energiateollisuus/fi/s%c3%a4hk%c3%b6/s%c3%a4hk%c3%b6kauppa/ediel-sivut/ohjeet%20ja%20suositukset/sanomaliikenteen%20me

nettelyohje%20vs1.4.pdf?SectionUri=%2ffi%2fsahko%2fsahkokauppa%2fediel-sivut%2fohjeetjasuositukset

(ET 2009b) Finnish Energy Industries. 2009. Sähkömarkkinoiden käytännön menettelyohje III – 18.3.2009 [Code of conduct of electricity market III] (in Finnish). [Online]. [Accessed May 6, 2009]. Available: http://www.energia.fi/content/root%20content/energiateollisuus/fi/s%c3%a4hk%c3%b6/s%c3%a4hk%c3%b6kauppa/ediel-sivut/ohjeet%20ja%20suositukset/s%c3%a4hk%c3%b6markkinoiden%20menettelyohje%20iii.pdf?SectionUri=%2ffi%2fsahko%2fsahkokauppa%2fediel-sivut%2fohjeetjasuositukset

(Eurelectric 2007) Eurelectric. 2007. EURELECTRIC Reference 'Retail Market Model': Bringing the Benefits of Competitive Electricity Markets to the Customer. [Online]. [Accessed March 23, 2009]. Available: www.eurelectric.org/Download/Download.aspx?DocumentID=22565

(Frontier Economics 2008) Frontier Economics. Research into the costs of smart meters for electricity and gas DSOs - A REPORT PREPARED FOR ENERGIEKAMER. [Online]. [Accessed June 2, 2009]. Available: http://www.dte.nl/images/Kostenonderzoek_FE&L_webversie_tcm7-121129.pdf

(Heck 2009) Heck, W. Smart energy meter will not be compulsory. NRC Handelsblad (web page, April 8, 2009). [Online].

[Accessed June 2, 2009]. Available: http://www.nrc.nl/international/article2207260.ece/Smart_energy_meter_will_not_be_compulsory

(Hernesniemi 2007) Hernesniemi, L. 2007. Vaihtokäyttäytyminen sähkömarkkinoilla [Switching behavior in electricity market] (in Finnish). Master's thesis. University of Vaasa.

(Innolink Research 2005) Innolink Research. 2005. Customer survey (in Finnish). [Online]. [Accessed May 25, 2009]. Available: http://www.energia.fi/fi/sahko/sahkokauppa/julkaisut/asiakastutkimuskesa2005.pdf

(Kinnunen 2008) Kinnunen. 2008. Sähkön laadun tunnusluvut sähkön jakeluverkkotoiminnan valvonnassa [Electricity quality parameters in monitoring of electricity distribution business] (in Finnish). Presented at the Management of customersip of grid companies (Verkkoyhtiöiden asiakkuuden hallinta) 2008 seminar.

(Kurkirinne 2009) Kurkirinne, E. 2009. E-mail interview. [Responded April 17, 2009].

(Law 1260/1996) Laki sähkön ja eräiden polttoaineiden valmisteverosta 30.12.1996/1260 [Law concerning excise tax of electricity and certain fuels] (in Finnish). [Online]. [Accessed June 3, 2009]. Available: http://www.finlex.fi/fi/laki/alkup/1996/19961260

(Lehtomäki 2009) Lehtomäki, E. 2009. E-mail interview. [Responded March 26, 2009].

(Ofgem 2008a) Ofgem. 2008. Energy Supply Probe – Initial Findings Report. [Online]. [Accessed April 15, 2009]. Available: http://www.ofgem.gov.uk/Markets/RetMkts/ensuppro/Documents1/Energy%20Supply%20Probe%20-%20Initial%20Findings%20Report.pdf

(Ofgem 2008b) Ofgem. 2008. Ofgem 2008 national report to the European Commission. [Online]. [Accessed April 7, 2009]. Available: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20reporting%202008/NR_En/OfgemNationalReport2008%20-%20FINAL%20V2.pdf

(Ofgem 2009a) Ofgem. 2009. Electricity act 1989 – Standard conditions of the Electricity Distribution Licence – 31 March 2009. [Online]. [Accessed June 1, 2009]. Available: http://epr.ofgem.gov.uk/document_fetch.php?documentid=14285

(Ofgem 2009b) Ofgem. 2009. Electricity act 1989 – Standard conditions of electricity supply licence. [Online]. [Accessed June 1, 2009]. Available: http://epr.ofgem.gov.uk/document_fetch.php?documentid=14269

(Ofgem 2009c) Ofgem. 2009. Networks. [Online]. [Accessed April 2, 2009]. Available: http://www.ofgem.gov.uk/Networks/Pages/Ntwrks.aspx

(Pakkanen & al. 2008) Pakkanen, M., Johnsen, T. A., Olsen, O. J, Närvä, T. Differences in Consumer Activity at the Nordic Electricity Market – Searching for Explanations. [Online]. [Accessed May 25, 2009]. Available: http://www.vaasaemg.com/pdf/Vaasa_Energy_Conference_2008.pdf

(Vasconcelos 2008) Vasconcelos, J. Survey of Regulatory and Technological Developments Concerning Smart Metering in the European Union Electricity Market. [Online]. [Accessed June 2, 2009]. Available: http://cadmus.eui.eu/dspace/bitstream/1814/9267/2/RSCAS_PP_08_01.pdf

(Wragge & Co 2006) Wragge & Co. 2006. Distribution Connection and Use of System Agreement. [Online]. [Accessed June 4, 2009]. Available: http://www.ofgem.gov.uk/Licensing/ElecCodes/DCUSA/Predesig/Documents1/15650-DCUSA.pdf