SMART CUSTOMER RELATIONSHIP

Investigating how customer relationships influence the development of demand response for the future electricity retail market

JAKOBSSON THORMAN, CARL-WILHELM KOVALA, TOMMY
ABSTRACT

The fact that household customers are central in the discussion of future sustainable energy systems compels the Swedish electricity retail companies to provide strategies in order to successfully follow the trends on the electricity market. The purpose of this thesis is to complement the electricity retail companies’ understanding of how they are able to enter a sustainable and close business relationship with these customers. The purpose is fulfilled by the analysis of how relationship concepts impact the development of demand response specifically. The information has been collected through a case study of Smart Customer Gotland, via interviews with people who have great experience from the field and via a survey directed towards the customers.

The results indicate that there is a major difference in both of the actors’ visions regarding the relationship. The company desires to enter a position where less support and high customization is available. Customers instead want more personal support because of their lack of knowledge and uncertainty of new systems. To succeed, the companies have to consider the fundamental influencing incentives, economy and comfort, while also maintaining the customers’ trust.

The most essential parts of the context specific relationship exchange are product exchange, information exchange, and social exchange. These should be directed towards maintaining and increasing the trust from customers. Focusing the resources earlier used for marketing, on these exchanges to make the current customers more satisfied will open up for using word-of-mouth primarily from early adopters. Continued work with these early adopters will also increase companies’ knowledge, which is important for the companies to strategically develop its business towards the market of smart energy solutions.

Keywords: business relationship, demand response, household customers, Swedish electricity retail market, trusted exchange, understanding.
PREFACE

Making a study concerning customer relationships on the electricity retail market has been a rewarding experience in the perspective of developing our knowledge of industrial economics and organization in the electricity market context. We have discussed the matter from many interesting points of view and understood that this strong relationship towards customers represents the future for the electricity market at a whole and is important in Vattenfall’s strategies towards their customers. In our master thesis there are some persons that we would like to thank since they have made this thesis possible and have helped us throughout the process.

First of all we are grateful that Smart Customer Gotland and Vattenfall AB Research and Development, Business strategy, R&D Nordic have let us experience the forefront development of energy systems and solutions. More specifically we would like to thank Anders Bohlin, Christina Svalstedt and Ulf Öberg for continuously assisting the thesis process, while they have helped us understand the importance of managing customers. Moreover, at Vattenfall we also would like to direct thanks to Jonas Alin for making our living in Älvkarleby and visits to the headquarters in Solna possible. We are also grateful for the specific support we have got from Cecilia Lindh and Fredrik Wallin, from Mälardalen University, during the process that has assisted us with understanding of the thesis problem. Additional thanks to Cecilia since she has provided us with new ideas in decisive moments during the thesis process.

Secondly the thesis has meant interaction with other organizations except from Vattenfall. Both Gotlands Energi AB and Svensk Energi AB have been important actors for our thesis development as they have provided us with the market trends in demand response along with a stronger customer perspective.

Västerås June 7th, 2015

[Signatures]

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EXECUTIVE SUMMARY

Demand response is a necessary tool when dealing with a possible scenario where the fluctuating power sources have a greater significance for the Swedish energy system. In order to achieve demand response among household customers to a large degree, customers must be involved in the processes together with the electricity companies and be committed to changing their electricity consumption, but this is a complex issue that requires a greater understanding of customer behavior. Above all, electricity companies need to increase their knowledge of customer behavior patterns and use a business relationship approach to achieve a sustainable partnership with its customers. The aim of the study is to analyze the existing business relationship between electricity retail companies and electricity customers and how it affects the development of demand response, as well as other energy services on the Swedish electricity market.

A case study of the development project SCG, Vattenfall AB’s market test of demand response along with GEAB, was conducted to collect specific empirical data that explains the situation and the relationship that exists between the actor in the project and its possible paths of development. This was used to exemplify the potential of working with household customers in the electricity market and understand the weaknesses in the relationship that limits the ability to implement demand response in the current situation. With a qualitative approach to empirical evidence and analysis, the relationship between the household customers and companies was investigated. This showed the participants’ own perceptions and perspective. The empirical data were collected through interviews with the personnel involved in the project, by a customer survey about the project and through a supportive analysis of activity data that the project continuously collected. Although a qualitative approach should characterize the study we chose to seek semi-detailed data from customers, instead of performing interviews with customers. We wanted to achieve an overview of the customers’ activity in the developed relationship.

To develop the electricity retailers’ understanding of customers and what it means to have a business relationship with them, the literature mainly explain the social concepts that affect the ability to develop a sustainable cooperation, such as trust, commitment, power, exchange, acceptance and satisfaction. These social relationship factors are closely linked and based both on the personal and emotional experiences as well as on the economic and rational decisions grounds. The most important findings from the literature review, was that trust is an important building block for realizing a positive impact from the other factors. Trust is also based on a preconceived trust level, which is corrected by the actual experiences from the exchange in the relationship, which in turn is based on other related factors as well. This led us into continued investigation primarily of trust and commitment in the interviews and the survey.

The Interviews revealed the low possibilities to achieve demand response from customers at the moment, because of a stable energy supply. Currently, the companies try to develop its knowledge of their customers so that they in the future market situation, where demand
response is necessary, can take actions towards this. Neither the market nor the companies reported to be completely susceptible to this development in their current situation, due to the lack of need regarding demand response. Instead we found that the electricity retail companies, such as Vattenfall and GEAB, need to learn more about its customers to be able to develop a closer relationship for a future situation that requires more complex and specific offerings. This is similar to what the industry needs in general. Careful preparation prior to the commercialization of products and services from the project was a prerequisite for successful cooperation with customers. Likewise, the key to engage customers in cooperation seemed to be to give them knowledge they can use to save money. Otherwise the customers’ prioritized their comfort. Customers in general also seemed to trust the electricity retailer, but companies wanted to improve this in order to achieve long-term trust that would last if the circumstances on the market would change.

The participating customers with automated control was generally more satisfied than those who actively did get involved in changing their electricity consumption. They were therefore also more likely to risk their reputation in recommending a friend or neighbor to join this development. Along with their trust in the heat control scheme, we could imagine an improvement in trust through their participation in demand response. The latter can be confirmed by the effort made by customers even though there has been a case of low price levels and thereby low economic incentives for the effort.

In conclusion, the advantages from using a relational perspective to analyze the project’s outcomes for the electricity customers and electricity companies we have been able to find the following issues and trends in this relationship, which may explain the behavior and activities of the actors in the project:

| Retailers are the single source of information for the electricity customers. |
| Very low benefits in opportunistic changing of electricity retailer. |
| Long-term relationships can create deeper customer specific knowledge. |
| Customers have high basic trust in the electricity companies in general. |

In turn, resources used to maintain customers’ trust in the company is the best investment the electricity retail companies can do. The reason for this is that these investments minimizes waste of resources because other investments risks being reduced by external factors, such as other companies’ influence and that customers are prioritizing other more direct relationships. We also found that a relationship based on trust-building exchange should be characterized by investments in three dimensions; product exchange, exchange of information and social exchange. These exchange types make it possible for electricity retailers to have closer relationships with their household customers, which can be used to make customers understand the benefit from using complex products and services, which could be used in demand response purposes.

At the same time, we have found great incentive for electricity retailers to align their interest in increased cooperation towards companies that sell energy-consuming products, such as
heat pumps. The development of the technology and the finished product will become cheaper if the risks and development expertise can be shared by the actors. In addition, they can collaborate on the execution of related services to the customer such as education and support. With this kind of cooperation the electricity retail company can avoid difficult persuasion campaigns towards the customers and instead focus on educating customers to use their heating systems properly. But in order to educate the customers, they must come closer, even to the heat pump suppliers to get a common starting point. Otherwise there might be a possibility that the different parties will disagree, thereby resulting in two different messages being displayed towards the customers. To reduce the risk of customer trust and commitment to be adversely affected by external parties, the energy retail company should include some of these measures in the further development of business relationships with household customers.
SAMMANFATTNING


En fallstudie av utvecklingsprojektet Smart Kund Gotland (SKG), Vattenfall AB:s marknadstest av efterfrågeflexibilitet tillsammans med Gotland Energi AB (GEAB), utfördes för att samla specifik empirisk data som förklarar den situation och relation som råder mellan aktörerna i projektet, samt dess utvecklingspotential. Detta användes för att exemplifera möjliga arbetssätt med privatkunder på elmarknaden och förstå samt upptäcka eventuella upplevda svagheter i relationen som begränsar möjligheterna att implementera efterfrågeflexibilitet i dagsläget. Med ett kvalitativt förhållningssätt till empiri och analys utforskas relationsperspektivet mellan privatkunderna samt företagen genom de medverkandes egna ögon och deras personliga uppfattning. Det empiriska materialet samlades in genom intervjuer med den personal som ingått i projektet samt genom en kundenkät som behandlade projektet och en understödande analys av aktivitetsdata som projektet kontinuerligt har samlat in. Även om ett kvalitativt förhållningssätt ska karakterisera studien föll valet på att inhämta semidetaljerad data från kunderna, istället för att utföra intervjuer med kunderna. Målet med detta var att få en överblick över kundernas aktivitet i den fördjupade relation som utvecklingen medför.

För att utveckla elföretagens förståelse av kunderna och vad det betyder att ha en affärsrelation med dessa fokuserades litteraturstudien främst på att förklara de sociala begrepp som påverkar möjligheten till att utveckla ett långsiktigt hållbart samarbete, såsom förtroende, engagemang, makt, utbyte, acceptans och nöjdhet. Dessa sociala relationsfaktorer är tätt sammankopplade och baseras både på personliga och på känslosamma upplevelser samt på ekonomiska och rationella beslutsgrunder. Slutsatserna av litteraturstudien var att förtroende är en viktig byggsten för att kunna uppnå en positiv effekt från de andra faktorerna och att förtroendet baseras på en förutfattad förtroendénivå så korrigeras av de faktiska upplevelserna från utbytet i relationen, vilket i sin tur också baseras på de övriga relationsfaktorerna. Detta lede till att vi fokuserade vår empiriska studie till att ta reda på hur förtroendet användes i relationen, men också vilket engagemang som parterna visade prov på.

Intervjuerna visade på låga möjligheter att uppnå efterfrågeflexibilitet från kunder i dagsläget, vilket beror av en stabil energiförsörjning. För närvarande försöker företagen
utveckla sin kunskap angående sina kunder så att de i en framtid marknadssituation, där efterfrågeflexibiliteten är nödvändig, kan vidta åtgärder. Vare sig marknaden eller företagen ansåg sig vara helt mottagliga för denna utveckling i dagsläget, på grund av bristande behov när det gäller efterfrågeflexibilitet. Istället fann vi att elhandelsföretag, som Vattenfall och GEAB, behöver lära sig mer om sina kunder för att kunna utveckla en närmare affärsrelation eftersom företagen behöver hantera mer komplexa och specifika erbjudanden i en framtid marknadssituation. Detta liknar vad industrin behöver ta till sig i allmänhet. Noggrann förberedelse innan kommersialisering av någon del i projektet var en förutsättning för att lyckas göra gemensam sak tillsammans med kunderna. Likaså var nyckeln till att engagera kunderna i ett samarbete att ge dem ökad kunskap som de kan utnyttja för att på sikt minska sina energikostnader. Ett stort allmänt förtroende fanns hos kunderna, men företagen vill utveckla detta för att uppnå ett långsiktigt förtroende som skulle fungera även när omständigheterna på marknaden förändras.

De deltagande kunderna med automatiserad styrning var mer nöjda i jämförelse med de som aktivt hade engagerat sig i att påverka sin elförbrukning. De var därför också mer benägna att riskera sitt rykte och rekommendera en vän eller granne att också pröva på detta. Tillsammans med deras uppvisade förtroende för värmeregleringssystemet kunde vi ana en förbättring av förtroendet genom deltagandet i efterfrågestyningen. Det senare påståendet om förtroendet kan bekräftas av de ansträngningar som gjorts av kunderna, även om det har varit en tidpunkt med låga prisnivåer och därmed låga ekonomiska incitament för ansträngningen.

Sammanfattningsvis har styrkan med att använda ett relationsperspektiv för att analysera projektets utfall för de inblandade elkunderna och elföretagen, varit att kunna finna följdande problem och trender i denna relation, som kan förklara beteendet och aktiviteterna från parterna i projektet:

| Elföretaget är kundens enda informationskälla på energimarknaden. |
| Väldigt låga fördelar i att opportunistiskt byta elförsäljningsföretag. |
| Långsiktiga relationer kan skapa en djupare kundspecifik kunskap. |

Kunder har ett högt grundläggande förtroende för elföretag i allmänhet.

Slutsatser tagna under examensarbets gång och under studien av affärsrelationen mellan elförsäljningsföretaget och elkunden, i arbetets specifika kontext, visar att resurser lagda på att underhålla kundernas förtroende för företaget förmodligen är den bästa investeringen företaget kan göra. Anledningen är främst att resurserna till detta minimerar resurslöseriet eftersom andra investeringar riskerar att förminskas på grund av externa omständigheter, såsom andra företags utbyten med kunderna och att kunderna prioriterar andra mer direkta relationer. Vi fann också att en relation baserad på förtroendestärkande utbyte bör karaktäriseras av investeringar i tre dimensioner; produktutbytet, informationsutbytet och det sociala utbytet. Med dessa utbyten finns en möjlighet att få en nära relation med
kunderna, som kan användas för att få kunderna att förstå nyttan med att använda komplexa produkter och tjänster, som bland annat kan användas för att uppnå efterfrågeflexibilitet.

Samtidigt har vi funnit stora incitament för elföretagen att rikta sitt intresse för ökat samarbete mot företag som säljer energikrävande produkter, framförallt stora energis lukare som värmepumpar och liknande. Utvecklingen av teknologin och produkten blir billigare när risker och kompetens kring produkten kan delas av parterna, dessutom kan de samarbeta kring utförandet av kringtjänster riktade mot kunden såsom utbildning och support. I ett sådant samarbete kan elföretaget undvika övertalningskampanjerna riktade mot kunderna och istället fokusera på att utbilda kunderna i att använda sina värmesystem på rätt sätt. För att kunna utbilda kunderna måste de komma närmare även värmepumpsleverantörerna för att båda ska kunna ha samma utgångspunkt. Annars är risken att olika parter säger emot varandra, vilket kan resultera i att två olika budskap framförs till kunden. Att minska riskerna för att kundernas förtröende och framförallt engagemang påverkas negativt av externa parter bör därför vara en prioriterad åtgärd av energiföretagen i den fortsatta utvecklingen av relationen till privatkunderna.
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<tr>
<td>DSM</td>
<td>Demand Side Management – Includes both demand response and efficiency measures. The idea is to affect the consumption of the customers in some way. This can be used to meet environmental objectives or to improve some other situation where the usage of energy has to be controlled.</td>
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<td>GEAB</td>
<td>Gotland Energi AB – Is a subsidiary to Vattenfall AB and has the complete coverage of the electricity grid together with a large share of the electricity retail on the Baltic island Gotland. GEAB is the main electricity retailer in SCG.</td>
</tr>
<tr>
<td>SCG</td>
<td>Smart Customer Gotland – A sub-project within SGG focusing on demand response and customer involvement. The project is performed as a real market test with real implications for the customers in the project.</td>
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<td>SCP</td>
<td>Smart Customer Price – The price model used in SCG, which has an hourly rate based on enhancements of Nordpool’s spot price. SCP is meant to vary more, in comparison to the regular spot price, similar to a situation where there is more renewable energy resources in the system.</td>
</tr>
<tr>
<td>SEA</td>
<td>Swedish Energy Agency – Is one of the actors funding the development project SGG. Also has the mission to promote energy development in Sweden.</td>
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<tr>
<td>SEMI</td>
<td>Swedish Energy Market Inspectorate – Controls and regulates the energy market for example to strengthen the position of customers by providing information.</td>
</tr>
<tr>
<td>SGG</td>
<td>Smart Grid Gotland – an on-going development project focusing on analyzing and implementing smart grids in a broader scale.</td>
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1 INTRODUCTION

Customers have got a highlighted position regarding the development of Smart Grids, and hence on the electricity market. A problem statement developed for this paper will motivate how and why the customer relationships are important for the electricity retail market, and especially for development projects, together with what the most essential problem to research within the context of Smart Grids is. Since researchers stress the need of further knowledge on customer management the purpose, the focal research question and the delimitation describes the specific project and case. This will enlighten how household customers, as an actor in the business network of an electricity retail company, are managed to achieve demand response aimed at the analysis of customer involvement.

1.1 Background

The Swedish electricity market has previously been, and will continue to be, focused on supplying secured electricity towards the customers of the electricity retail companies. The development of the market, however, calls for more customer oriented solutions as another aspect to take into consideration to achieve sustainability. This consideration is further applied in the development projects on the electricity market. Beginning to adapt offerings to the electricity customers is, therefore, a first step towards competitive advantages, and this starts in development projects.

The electricity customers are central in the development because they have the opportunity and responsibility, with an adaptable consumption of electricity, to make Smart Grids and a higher share of fluctuating renewable energy resources possible. The Smart Grid has the advantage of modernizing production, distribution and consumption of electricity, that all are integral parts of the Smart Grid concept, and at the same time avoid expensive investments in increased transmission and production reserves (Siano, 2013). Smart Grids are beneficial for handling fluctuating electricity production from renewable energy resources, such as wind and solar power (Siano, 2013). This is done through effectively controlled transmission and distribution, based on information flow within the distribution networks, which increases the reliability of a stable electricity supply (Siano, 2013). Siano (2013) focuses on the importance of the consumption side of Smart Grids, the concept of demand response. Demand response is mentioned as large part of the Smart Grid solution as well as an advantage for modernizing the energy consumption. It includes making electricity customers aware of their own consumption patterns, as well as the national consumption patterns, and how it affects the wholesale prices paid by the electricity retail companies. This means an increased cooperation between the customers and companies, where the relationship has to be studied further to achieve possible synergy effects.

Researchers have found the need of pinpointing the best practices on involving household customers in the processes of these companies (Gangale et al, 2013; Honebein et al, 2011). Apparent is the importance of interaction with the household customers and increasing their commitment, which further relies on customers’ trust. This enables the company to manage,
to understand and to increase their knowledge of the behavior of the customers comprehensively (Gangale et al., 2013). If those are not considered in such development projects, the full potential will be at risk when implementing Smart Grids in a future electricity system (Honebein et al., 2011).

The general focus of projects, however, is foremost on technology and economic incentives (La Rocca & Snehota, 2014; Verbong et al., 2013; Wolsink, 2012). This focus limits the possibilities to analyze the above mentioned concepts and to investigate possible scenarios in demand response. Instead the development of innovative technologies requires business relationships with actors both on the supplier side and the customer side, as well as including network actors from multiple sides (La Rocca & Snehota, 2014). In this sense there are important advantages, such as commitment, to achieve from having a business relationship with your customers that are complementary to the advantages of having a business relationship with other surrounding actors in the business network. However, the understanding, creating and managing the exchange situations of the customer relationship is the foundation when trying to understand the more complex impact of business network actors (La Rocca & Snehota, 2014; Pels, 1999; Webster & Lusch, 2013). In this sense, the research of customer involvement in Smart Grid projects should include the perspectives of business relationships and business networks.

To involve the customers in relationships used for demand response, the focus of the projects should include the social context (Geelen et al., 2013). This social context has in recent research been described as observing the customer within the households, since it is important for the understanding of the decisions of customers and is therefore fundamental in the creation of a future power system. It would therefore be important to research and study the behavior of electricity customers within on-going and recently finished Smart Grid, or Smart Home, projects to find out what the companies are doing to observe, understand and create commitment among their involved customers (Gangale et al., 2013; Mengolini & Vasiljevska, 2013). These factors are the starting point of the definition of a closer business relationship. Focusing on relationship activities, instead of focusing on sales and offerings, is also strongly recommended by Ford et al. (2011).

The connection between the business network and the business relationship is influenced by actors surrounding and affecting each other to act in its business environment. In the specific case of Smart Grids, those actors that are focal in the business network are the companies in the electricity supply chain together with the electricity customers. This would apply to a straightforward buyer and seller relationship perspective with a hint of the understanding of consumer behavior. This characterizes the case of the Swedish project Smart Customer Gotland (SCG) controlled by Vattenfall AB and Gotlands Energi AB (GEAB).
1.2 Problem statement

The main problem on the customer side of Smart Grids is to find a way to involve customers in the process together with the electricity retailers, which creates continuous commitment and trust among the customers (Gangale et al., 2013; Honebein et al., 2011). Increased collaboration between household customers and the electricity company is necessary to stay competitive on the electricity market. This problem is however far from solved if attention is not focused on the more basic problem of understanding the behavior of customers in the context of electricity consumption and acceptance of demand response systems (Gangale et al., 2013; Geelen et al., 2013; Mengolini & Vasiljevska, 2013). The task of how the behavior of household customers can be understood and what factors to include in the analysis creates the scope for this thesis.

Although the economic benefit is an incentive for customer activity, alone it is not enough to understand the behavior of the customers. The difficulty with involving and managing customers is that the matter of understanding the customers is as complex as the research field of consumer behavior in a whole. The development of demand response systems within Smart Grids does propose a change regarding the view of a customer as a simple buyer to the view of a customer as an important business exchange actor which activities are integrated with the activities of the company. This brings an increased need for the companies to understand how the social factors affect the market, forming the idea of a business relationship between the customers and the electricity retail company. The perspective of business relationships tries to explain why an actor behaves in a certain way through placing it in the context of another actor which the first actor has some exchange with, in this way the social factors can be included to explain certain behavior in market situations. The perspective can therefore aid an electricity retail company, like Vattenfall and GEAB, with management of household customers that reduces the costs of misdirected incentives, used to achieve demand response, and help the company to achieve more satisfied customers that stays committed to their electricity retail company. In this change of view the perspective of business relationships also explains that the considerations within the relationship, as a response to the situation in the business environment or network, can strengthen the advantages for the actors in the relationship (Anderson et al., 1994). This supports the original relationship perspective through adding further context to the business relationship.

In the case of electricity customers it adds the effect the electricity market has on the relationship, and in turn on the electricity customers.

In the end, understanding the behavior and actions of electricity customers, in the context of electricity consumption and demand response, will help electricity retail companies, like Vattenfall and GEAB, to create suitable ways for involving customers in the balancing processes of the electricity market. This is why a business relationship perspective on the cooperation with customers is important for the development of sustainable energy systems in Sweden.
1.3 Purpose

The purpose of this master’s thesis is to analyze the focal relationship, in a business relationship context, between the electricity retail company and the electricity customers which influence the development of demand response. Hence explaining how the business relationship impacts the behavior of the customers, their electricity consumption patterns and the exchange in the relationship. The usefulness of the business relationship perspective is mainly to achieve a more complete understanding of customers’ behavior in the context of demand response. Through this understanding the possibilities to make the right strategic decisions to increase customer commitment towards a sustainable electricity consumption are strengthened. The perspective of the thesis will also be useful for the development of other complex energy products and services, similar to what is offered in demand response.

1.4 Research question

The purpose will be fulfilled by answering the following research question (RQ):

How does the exchange in the business relationship between household customers and the electricity retail company affect the opportunities to develop demand response aimed to be fitted for the electricity customer?

The RQ is meant to provide an understanding of the business relationship, regarding demand response, to determine the focal relationship characteristics. This implies an analysis of the relationship activities and thus focused on the exchanges, the investments and whether or not the actor accepts the other actor activities in this business context. Incentives have an approach of affecting one actor’s decisions, this means that it is necessary to understand how these incentives influence the activities within the relationship. In this sense the relationship between the household customers and the electricity retail company is analyzed regarding if enough collaboration is achieved or not. The business relationship perspective can make the company understand the importance of the exchanges and how the exchanges can achieve demand responsive customers. This fulfills the idea of implementing Smart Grids and thus demand response.

1.4.1 Research approach

In this master’s thesis, the RQ is answered by studying the case of the development project SCG. This includes the focal relationship between the companies Vattenfall and GEAB, and the household customers participating in the SCG on Gotland. Even though the household customers belong to GEAB during the development project, Vattenfall has an understanding about their performances from accessing customer information and data. Furthermore, the RQ together with the business relationship context consists of two dimensions including the customer perspective and the perspective of the electricity retail company (the developer). This indicate a need to study two sub-questions derived from the RQ.
The household customers are invited to the development project much like an external actor would be. Furthermore, the individual actor’s decisions are characterized by consumer behavior, which impacts the processes included when developing closer interaction. It is therefore appropriate to analyze this group of customers in a business relationship perspective with focus on the exchange. In the customer perspective we seek an answers to the first sub-question:

*How does different levels of customer trust, commitment and acceptance influence the contribution of the customers to the activities of an electricity retail company?*

The electricity retail company, in this case both Vattenfall and GEAB, manages the development project SCG and affects the business relationship with the aim of increasing their understanding regarding the household customers. In other words, the complexity of managing customers at the moment inhibits a closer interaction and relationship, but through the finding of a connection between the activities they perform and the resulting behavior of the electricity customers the electricity retail company would be able to decrease the complexity. In the perspective of the electricity retail company we seek an answer to the second sub-question derived from the RQ:

*How can an electricity retail company use incentives to affect the behavior of customers, in a demand response perspective, and how does it affect the business relationship?*

The coordination of activities can also be influenced by the surrounding environment, i.e. the business network. The actions performed in the relationship from one actor is then somewhat dependent on actions performed in other relationships with actors, whether they are directly or indirectly connected to the focal one. In this context Gummersson & Polese (2009) recommend to apply the business network view in all marketing processes. Therefore the business network is embedded in the second sub-question with the reason to include different actors’ potential to influence the development of demand response and the current situation that demand response has to develop from. It is here the challenges for the electricity retail companies can be found, through the perspective of the industrial organization Svensk Energi.

### 1.5 Delimitation

The theme of the study is to investigate the business relationship, between the household customer and the electricity retail company, in the case study of Smart Customer Gotland. In the case the participating household customers, which are central in the development project, are offered products and services that come with the perspective of demand response. We choose to investigate how the customers perceive the exchange in the business relationship, where the products and services are included. Thereby we exclude the technical functions of
the systems developed as well as these customers’ conditions of the household. The perspective of the study also means that general competition strategies, for example price competition, are excluded. However, price and marketing are of course existing features that affect the context of the business relationship and is a natural part of the offering that is needed to achieve demand response.

The chosen object for the case is on the Swedish electricity retail market, the study is therefore also focused on the conditions and trends in Sweden. However, some examples have also been taken from other countries to provide an overview of the progress of demand response and customer attitudes in general. These examples can be used since some of the trends can be found in other countries as well. The case of this study is also delimited to the choices that have been made in SCG, such as focusing on demand response for electrical heating. For this study it means the attitudes and opinions from the customers primarily are based on that the project has focused on the controlling of the heating systems in the homes of the customers. The customers have, however, had the chance to by their own interest and knowledge affect the electricity consumption from other appliances, which can have some effect on the results gathered from the project.
2 THE TREND ON THE SWEDISH ELECTRICITY MARKET

In the following sections the current trend of energy services, market and technology reforms that conditions the possibilities for the companies, pricing discussions and the increased interest in forward integration of the electricity retail companies are described to provide a picture of recent developments on the Swedish electricity market. These current trends have an evident effect on how business relationships can be used on the market, since it exists in the business environment of the relationship.

2.1 The key solutions to energy and climate concerns

The Swedish electricity market has some characteristics that make the actors on it forced to investigate market-scenarios that lie far ahead in time. The condition on the market is largely controlled by governmental policies, which is supported by governmental agencies like the Swedish Energy Agency (SEA) and the Swedish Energy Markets Inspectorate (SEMI). This together with the influence of the European Union regarding policies and ageing nuclear power production units have made companies on the market uncertain of what to expect in the future. An attempt from companies, to try to control the situation, could be to set up proactive development projects which in advance would investigate scenarios for the future electricity market. One of these scenarios is the development of Smart Grids.

International organizations, such as the EU, agree to that the use of energy in the global community must decrease and become more efficient, to achieve the climate targets (European Commission, 2010). In this matter, energy efficiency and energy conservation play important roles in the transition to achieving a more sustainable society, both by reducing the overall end-use energy consumption and also reducing the further impact from carbon dioxide emissions. Furthermore, energy efficiency is central in the targets and energy strategies for year 2020, which is supported by a specific directive (European parliament and council, 2012). The Energy Efficiency Directive requires the member states to increase the focus on the customers, and therefore direct the energy companies to set up energy conservation measures, energy information and activities for the energy consumers. The states are also meant to provide incentives to develop new innovative business models for increased energy efficiency.

With this energy transition, energy companies have to take actions processing the challenges of the energy infrastructure and improve the relationship with the available customer base. This is what the companies, in the future, should regard as their core competence. The existence of Demand Side Management (DSM) is evidence of a development towards customer relationships that already is in progress. Both promoting energy efficiency and energy conservation together with demand response give fundamental opportunities for companies to develop Smart Grids and Smart Home solutions (Apajalahti et al., 2015; McKinsey & Company, 2010; Sousa et al., 2013). For the companies, DSM implies a greater involvement in energy services, making the companies shift from being energy suppliers to energy service providers (Apajalahti et al., 2015).
2.2 The reforming of the electricity market

The deregulated Swedish electricity market refers to the separated markets for electricity production and for electricity retail towards the consumers of electricity. These markets are free to join for any company that fulfills certain requirements. These parts of the electricity market are privatized. But the reform was not a complete deregulation (Hagman & Heden, 2012). The electricity distribution market is not completely deregulated, which means that in some parts of that market there are no competition between the actors. Therefore in the same reformation of the complete electricity market it was stated that the companies that would act on the electricity distribution market would be unbundled from the actors on the other markets (Hagman & Heden, 2012). This has constructed a situation where the electricity customers face two instances on the electricity market, the distributors and the retailers.

The Swedish governmental agency SEMI are now preparing to make the electricity market easier for customers to face and understand. Their suggestion is a Supplier Centric Model where the electricity retailers will get the primary responsibility towards customers in all customer related cases and only one invoice will be sent to the customer, which is intended to be completely implemented in a couple of years (Swedish Energy Markets Inspectorate, 2015; Liikanen et al., 2014). This would mean a significantly decreased contact between the customers and the distributors/grid owners and a focus on the relationship between the electricity retail company and the electricity customer.

2.2.1 The reform for hourly metering

Since October 2012 household customers in Sweden have had the possibility to get their electricity consumption measured per hour, if they have an electricity contract with their electricity retail company that needs hourly metering (Nilsson et al., 2014), so called hourly price contracts. This was meant to give customers further incentives to adapt their electricity consumption patterns to the electricity spot price, i.e. demand response, but few customers have since then shown an interest for hourly price contracts (Nilsson et al., 2014). It is possible that the customers were unsure whether their specific consumption patterns would make them better off financially with these contracts (Nilsson et al., 2014). This reform has increased the number of offered energy services on the market, in most cases services in visualization of the customer’s consumption, and made the development of products for automatic consumption control increase (Nilsson et al., 2014). It has also been a foundation for possible demand response projects, like Smart Customer Gotland.

Other studies have shown that hourly price contracts have impact on customers’ electricity consumption patterns, but that the impact is varying and sometimes even inconclusive. Some customers did reduce their total electricity consumption and their consumption at peak hours, in other cases customers, however, instead seemed to increase their electricity consumption (Allcott, 2011; Torriti, 2012). Furthermore, in development projects the hourly price contract is criticized since the customers who have it are more responsive of their electricity use and thus react to the price signals more often, compared with other customers that do not have these contract (Goulden et al., 2014). This means that the results from projects where customers already have the right conditions for hourly price contracts can be
misinterpreted. The hourly price contracts are also used in different ways in SCG, see Appendix 4.

Other attitudes towards a differentiated grid tariff have been analyzed in a Swedish research project, in Vallentuna. The project implemented a grid tariff that depended on the general consumption patterns in Sweden and therefore made the electricity price higher at hours where most customers consume electricity (Bartusch et al., 2014). They found that the grid tariff had effect on the customer attitudes and their intentions to shift the electricity consumption from peak hours to hours with lower electricity price. But, when they analyzed the customers’ actual behavior there were no differences in their electricity consumption. In this matter the connection between the grid tariff and the behavior was vague. In the conclusions for the project the electricity customers, in some cases, even before the project consumed electricity at hours with low electricity price, which developed a barrier to adapt the electricity consumption against the grid tariff (Bartusch et al., 2014). Two different types of grid tariff are used in SCG. How they are used is described in Appendix 4.

2.3 Electricity consumption in typical households

Closer customer relationship are required when the companies’ intentions are to go beyond regular information exchange and develop energy services that enable the company new sources of revenue. Developing energy services, in collaboration with customers, which provide customer solutions can increase their market shares. Companies therefore have multiple reasons to find smart solutions to achieve efficient and effective electricity-saving in households. These are further in competition with other solutions, which not necessarily are provided by energy companies.

Electricity consumption for space heating and water heating in small Swedish houses remain the most common heating method (Swedish Energy Agency, 2014). A direct comparison with other electricity consumption sources in a Swedish household can be found in Zimmerman (2009). In Figure 1 it is evident that electrical heating is a more common source of heat in houses compared with energy statistics for other dwellings and non-residential premises.
2.4 The forward integration of the electricity retail company

In order to aid the customers with different types of services the electricity retailers are interested in forward integrating, to have an active role in the consumption of the customers. In the years of 2010-2012 a pilot project was conducted to investigate possible electricity cost savings of optimized household heating by indoor temperature smoothening and automatic load shifting (Persson et al., 2012). This was achieved through weather forecasts, temperature information, and through price information (Persson et al., 2012). Findings from simulations of the optimization were that the optimizing of a ground source heat pump could save above 2000 SEK a year in electricity costs and that the time dependent grid tariff creates the largest cost savings of the load shift because of low price volatility (Persson et al., 2012). Prototyping of the product, however, found challenges in adapting the product to the diversity in heating systems and types of houses. The pilot project succeeded to verify a 5-10 percentage energy savings with the prototype and that 10 kWh of heat could be shifted without impacting the daily comfort level of the customer (Persson et al., 2012). Much of this research have had similar objectives as SCG with a fundamental idea of a company taking control of the customer’s heating system in order to improve the situation of the actors involved, see Appendix 4.

However the customers’ interests in and attitudes to energy demand response are further an obstacle for the companies to manage. At least if the customers have to change behavior or decrease comfort. Researchers from Umeå University in Sweden in collaboration with SEMI have in a study analyzed the household customers to find what opportunities and driving forces that are available to change their consumption pattern (Broberg et al., 2014). The study concluded that the customers in general have low knowledge of their costs associated with their electricity consumption even though they have relevant information available, such
as detailed electricity costs on the invoice. Combined with the low cost reductions that demand response offer, this impacts the customers’ willingness and possibilities to react on the relevant information. Adaptability should be possible if the economic incentive becomes higher, from more fluctuating prices. Their further conclusions regards that it always will be a demand to consume electricity at the peak hours during the day. Achieving demand response through regulated electricity use, each weekday between the hours of 17:00-20:00 were the price peaks, would in average cost be between 630-1435 SEK per year depending on whether the demand response comes from heating or electricity (Broberg et al., 2014). In summary, the conclusions are firstly that the economic incentives are too low compared to the compensations that the customers want and secondly that the willingness to move consumption is highly varying between different households.

In another case, where the possibilities for new and more complex energy services and contract models were investigated, the pre-existing customer relationships had high importance for the outcomes. The relationships between the electricity retailer and the customers were characterized by pressure from the municipality regarding their mission against carbon emission (Apajalahti et al., 2015). With this pressure, the retailer was unsure how the customers would react to such energy services due to an already fragile relationship (Apajalahti et al., 2015). It would mean that they risked losing customers and risked gaining an even worse reputation from dissatisfied customers (Apajalahti et al., 2015). However, the customers still preferred to obtain energy advices from their own electricity company prior to appliance manufacturers and energy field expert organizations, but they were further unwilling to invest in deeper relations via these new services. The latter was because the customers felt uncertain whether the energy companies’ objectives with the services (Apajalahti et al., 2015). Moreover, the customers had a superficial trust in combination with skepticism since the responsibility for the savings was in the hands of the electricity company, rather than in the hands of the customers.
3 LITERATURE REVIEW

This chapter includes the literature review, and aims to describe the academic research area used for the thesis. This chapter defines the business relationship more comprehensively since it represents the head subject of this thesis. Likewise, characteristics that the business relationship embraces will further be covered in subsections regarding the social dimension of consumer behavior together with a review of trust, commitment, power balance, and exchange in a business relationship. The review is connected to the specific relationship between household customers and the electricity retail company.

3.1 Introduction to the literature review concepts

Table 1 presents the main concepts of this thesis study and their respective description of how the concepts are defined in the context of this thesis. The descriptions of the concepts have been developed specifically for this context and these definitions are explained in detail in this literature review.

Table 1 - A summary of the most important factors for a relationship between household customers and electricity retailers and how they are specified in the context-specific relationship.

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptance</td>
<td>If customers develop acceptance towards the technology they will promote it rather than having a defensive attitude or making resistance against it. Acceptance can also be deciding to buy or use what is offered. Acceptance from customers therefore depends on that the company can show that it understands the actors’ different interests, temptations and risks, to make products and services that are acceptable for customers.</td>
</tr>
<tr>
<td>Commitment</td>
<td>Commitment can be found in the relationship if the parties make exchanges that mainly benefits the other actor in the relationship because the actor perceives that the relationship is important in some way and wants to continue it.</td>
</tr>
<tr>
<td>Exchange</td>
<td>Exchange is both expressed in the short-term (exchanged events) and in the long-term (exchange relationship), while it includes two parties’ expectations, actions and outcomes of a complete event. Further the event should not make one party worse off after the event.</td>
</tr>
<tr>
<td>Power balance</td>
<td>Power balance can be found in the relationship if the actors put effort into the relationship in a process-like manner where effort from one actor is followed by effort from the other, because of a feeling of that both actors have some responsibility towards the relationship.</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Satisfaction comes from the fulfillment of the actor’s expectations, which results in that the actor wants to continue the relationship and repeat purchase. This includes actions for adaptations, cooperation, social interaction and routinization.</td>
</tr>
<tr>
<td>Trust</td>
<td>Trust can be found in the relationship if the actors invest in the relationship even though they are recognizing risks that accompanies the investment, with the argument that previous cooperation has been successful.</td>
</tr>
</tbody>
</table>
3.2 The business relationship and the dyadic relationship

Business relationship is a common, and complex, expression since it ranges from the complexity in the focal relationship to the business network (Ritter et al., 2004). In order to manage this complexity, interaction is an important tool to improve the understanding of how the business partner plans and behaves. In other words, the more an actor understands the business relationship, the actor would increase its ability to successfully manage it and then operate in the relationship as a part of the business network (Ford et al., 2011). Companies have to consider the reality of business relationships. Ford et al. (2011) highlights that the company has the ability to influence the other actor’s behavior and learn from the other actor, but that this costs resources. Ford et al. (2011, p. 40) concludes this with the following statement:

“[...] it is better to see a relationship as a complex, but necessary, process that must be entered into with care and with due regards to its costs and problems.”

This reality highlights the substance of a relationship, where the actors in the dyadic relationship are interdependent through their activities. The activity performed by one actor effects the activities of the other actor. This is natural when the dyadic relationship is a buyer and supplier relationship. Even though both sides of the focal relationship are important to investigate, the problem studied here is focused on understanding the customer side, while the supplier side complements the investigation. Therefore it is in our interest to make a review of business relationship literature that is applicable for the customers in the development project Smart Customer Gotland.

3.2.1 Business is synonymous with keeping customers

It is possible to reduce the problems with high-involvement in customer relationship since the nature of the relationship has benefits that can counter the problems (Ford et al., 2011). The benefits of this degree of involvement in the relationship can make communication and flow of information easier to perform and therefore more effective. This would reduce the uncertainties and other surrounding issues related to the business relationship. However, this degree of involvement with customers can also consist of disadvantages (Ford et al, 2011). The relationship can be both time consuming and resource intensive. There is also the uncertainty regarding the behavior of the other actor and that the freedom of one actor can be limited when there is a high involvement in a relationship.

In the business relationship between the electricity retail company and the household customers there are specific conditions regarding the actors’ different interests that make such a relationship complicated. Household customers are not as interdependent, with the companies they are interacting with, as a typical business-to-business actor would be (Willenborg., 1999). These customers do not limit their possibilities in the same way as a company would do, mostly because the cost for the household customers to exit a relationship is lower. Moreover, a positive attitude from customers includes the trust as
embedded in the attitude towards the actor the customer has a relationship with (Willenborg, 1999). The differences in actors’ interests and attitudes are considered in the social dilemma approach (Willenborg, 1999). The approach focuses on the dynamic interactions that a relationship faces, regarding the short-term temptations and the risks with long-term relationships that the actors have to manage, i.e. choose if they will have a non-cooperative or cooperative behavior in the relationship.

### 3.2.2 The characteristics of long-term business relationship

The definition of business relationships describes methods for achieving long-term cooperation between two business actors (Ritter et al., 2004; Tikkanen & Alajoutsijärvi, 2002). Tikkanen & Alajoutsijärvi (2002) describes how customer satisfaction, which is a common concept in traditional marketing, can be seen as the fulfillment of the customer’s expectations from before the purchase. They continue, in a business relationship the repeated purchases are at the same time pre-purchase situations. In this case customer satisfaction becomes a deciding force if the relationship will continue and if it may be long-run in practice. Especially important characteristics to achieve the demanded level of satisfaction in the relationship comes from the informal routines in the processes of these relationships (Tikkanen & Alajoutsijärvi, 2002). This means that adaptation and cooperation is developed through social interaction in the relationship and later informally expected to continue.

The most apparent characteristics of the processes in business relationships are adaptation, cooperation, social interaction and routinization (Tikkanen & Alajoutsijärvi, 2002). Variables affecting the processes in the relationship have been discussed by Morgan & Hunt (1994) where trust and commitment are argued to be mediating variables that summarize the influence of all other factors and therefore solely affect the outcome of the relationship. Power is another factor which by Brennan & Turnbull (1999) is argued to have a large, but not full, impact on adaptation in business relationships. Increased power for an actor is though not characterized as promoting efficiency, productivity or effectiveness in a business relationship (Morgan & Hunt, 1994). However, mutual adaptation is linked to effectiveness in performance and when analyzed by Mukherji & Francis (2008) power elements together with the social elements, consisting of trust and commitment, are decisive factors for successful mutual adaptation. Therefore it is appropriate to say that three main and interconnected affecting factors exist for the work in business relationships; power balance, trust and commitment. These are also the factors that have to be considered to be able to achieve the right level of satisfaction for the other actor in the relationship. The complex relationships between the business relationship factors is seen in Figure 2.
3.3 The behavior of a household customer

Consumers are not defined by a relationship with a specific seller, rather as a user that has been a participant in a market with different sellers of product or services (Webster & Lusch, 2013). On the other hand, consumers can be associated with and defined as customers if there is a relationship with a particular seller (Webster & Lusch, 2013). Hence even with a buyer perspective the consumer perspective cannot be neglected.

Understanding and managing consumer behavior requires deeper knowledge of how a certain behavior can be changed. With this knowledge the behavior change can be maintained over time. This ranges from the knowledge about needs of a customer and cultural considerations, such as social, cultural factors and norms, to knowledge about the customers’ attitudes towards a technology (Mengolini & Vasiljevska, 2013). If one actor, in the business relationship, develops acceptance towards the technology, this shows through the behavior of promoting it rather than having a defensive attitude or making resistance against it (Huijts et al., 2012). However, developing acceptance for a technology does not necessarily mean that one chooses to buy it.

Consumer behavior in relation to electricity consumption is also influenced by customers’ attitudes based on their reaction from incentives. The attitudes these incentives generate are also affected by characteristics within the specific relationship. This means that the attitude also involves levels of trust, exchange, risks, temptations, and the differences in interests associated with the relationship (Huijts et al., 2012). A lack of economic benefit impacts the motivation of customers and if not a specific satisfaction level is reached by the benefit, the customers will look to switch supplier or even be inactive in the relationship with the supplier (Yang, 2014; Broberg et al, 2014). Other findings of customers consumption behavior adds the attitudes towards the environment as a reason to why customers could decrease their energy consumption, but points out that the economically and environmentally incentive are not enough to understand consumer behavior (Vassileva et al., 2012). There are more factors,
than attitudes, that determine the actual behavior. They further argue that the behavior is further characterized by interest in choosing low-consuming technologies if these fulfill properties that concerns the normal living standard. Moreover, in the beginning of the process of changing the behavior of customers, information and communication used for motivation and keeping the interest up has to follow the practical information for changes. Giulietti et al., (2005) suggest that information is a way to reduce customers’ perceived costs from changing the behavior. However, the household customers are, to some extent, restrictive to information exchange (Broberg et al., 2014). This means that communicating with the customers can be difficult for a company. Informing the customers can also be difficult because it is uncertain if the customer is susceptible for the information and understands it.

To understand and manage customers in the business relationship, the incentives have to be complemented by social and physiological characteristics. When the definition of social relationship is raised by Friman et al (2012), they conclude that there are interpersonal factors that have larger impact on the continuation of the relationship in comparison with money and exchanged goods.

In conclusion the most significant subject when trying to explain customer behavior is acceptance. Acceptance means that a customer has a choice to make regarding if it has a need for something or not, and what the fulfillment of that need is worth. This is linked to the approach of analyzing customer attitudes and cooperative behavior to decide if a customer could accept what is offered to fulfill a potential need.

3.3.1 Acceptance is crucial for the development of sustainable systems

Getting acceptance from customers is difficult if the offering is not meeting existing needs of that customer. One example of achieving acceptance, coming from cooperative behavior, is to use customers’ emotions which more specifically could lead to a degree of responsibility (Willenborg, 1999). It is therefore appropriate to connect the social dilemma to what characterizes the social acceptance of renewable energy innovations, mentioned by Wolsink (2012) and Mengolini & Vasiljevska (2013). The social acceptance also influence cooperative behavior. It contains three dimensions including socio-political acceptance, community acceptance and market acceptance. The dimension that is most connected to consumer behavior is the last one, market acceptance. The consumer layer is primarily focused on the understanding of consumer behavior together with motivating the customers to use the product (Huijts et al., 2012; Willenborg, 1999).

In Figure 3 the three dimensions of social acceptance and social dilemma are connected with each other. The three explanatory points in the consumer/market acceptance dimension describes how customers decide if they choose being cooperative or non-cooperative; their interests, short-term temptations and risks. All three are further discussed later in the literature study, but the interests are instead discussed as shared values and the temptations are discussed as opportunistic behavior. To get acceptance from customers the companies have to show to the customers that they understand why these three points can make a product or service unacceptable for the customers.
A customer can accept something, for example a technical product, if the customer has knowledge about the technology and understands its characteristics, but a customer’s trust in a company could also be enough to make the customer accept the product (Huijts et al., 2012). The customers’ abilities to manage technologies, which can be perceived as complex or relatively unknown, must be understood by the company responsible for the product. Trust is then an important part of the discussion about acceptance, since without trust acceptance is more or less impossible to reach (Huijts et al., 2012). On the other hand, acceptance of not to having the full control over a situation is essential for trust (Bergmasth & Strid, 2004). This comes from the fact that the responsible actor of the technology, in most cases, have broader and deeper understanding of it in comparison with the customers, which the technology was intended for. It is therefore relevant to try to understand both trust and acceptance when customer behavior is investigated. However, other researchers reject trust when trying to describe human behavior in market situations (Bergmasth & Strid, 2004). This could possibly be connected to the reasoning about that household customers might not get as interdependent as a normal business actor would get in a business relationship.
3.4 Understanding trust

Trust is the relationship factor that has most concepts in common with consumer behavior. When Morgan & Hunt (1994) developed the Key Mediating Variables (KMV) model, based on empirical material from different research areas (Friman et al., 2001), they described that the trust in a relationship was directly affected by the shared values of the companies, the communication between them and the existence of opportunistic behavior from the relationship counterpart. The latter is defined as something that counteracts trust and the primary reason behind the need of trusted partners (Bergmasth & Strid, 2004). Other factors associated with trust would be fairness in exchanges and the perception of the relationship as worthwhile and satisfying, but when investigated these factors are not found to have specific impact on trust (Friman et al., 2002). When the KMV-model was tested empirically by Friman et al. (2002) trust seemed to depend on the personal opinions from earlier interactions, such as if they were nice people. This meant that the development of the business relationship trust was as much a development of a personal relationship between individuals in the companies. When applying these findings to the context of the relationship between the electricity retail company and electricity customers it seems that the development of trust could be very similar to the process described above. This comes from the fact that trust is dependent on how individuals reflect over their counterparts, which is an important aspect when it comes to understanding the behavior of household customers. This results in that the definitions of trust used for business relationships can be used as they are, even for the study of the relationship between electricity retailers and household customers.

3.4.1 Defining trust

Trust is a concept and factor that is used in many different situations to describe actions that are performed with confidence even though other actors have a possibility to affect the outcome of the action. Qualities that are used in describing trust are consistency, competence, honesty, fairness, responsible actions, helpfulness, and benevolence, reliability, standing by its words and fulfilling promises (Morgan & Hunt, 1994; Friman et al., 2002). Morgan & Hunt (1994) mentions the willingness to rely on the partner as an outcome of trust and that this therefore forces the definition of trust to consider the accompanied risks that an actor is taking because of its trust in the partner. Other researchers (Friman et al., 2002, p. 405; Mukherji & Francis, 2008, p. 157) have though adopted the following definition of trust:

"The willingness to rely on an exchange partner in whom one has confidence [...]"

However, in the context and problem of this thesis the definition of trust from Finch et al. (2010, p. 1021) is more appropriate:

"[...] the willingness to accept vulnerability based on positive expectations about another’s intention and behaviors’ [...]"
Similar definitions have also been adopted by other researchers (Bergmasth & Strid, 2004; Huijts et al., 2012). In the use of the definition of trust for the context of the electricity retailers and electricity customers, trust can be found in the relationship if the actors invest in the relationship even though they are recognizing risks that accompanies the investment, with the argument that previous cooperation has been successful.

3.4.2 Complex energy services demand trust

In energy research, energy services have been found to be a way for companies to strengthen relationships with customers, through regular courtship, as well as they give a possibility to get to know the customers (Bergmasth & Strid, 2004). By these exchanged services an electricity retail company can also build trust, which in turn reduces costs for the company (Bergmasth & Strid, 2004). In the use of trust in relationships there are though some stages that describes the trust in the relationship and how an actor could proceed with the relationship.

The first stage is instrumental primary trust, where the level of trust is set by evaluating benefits from establishing or maintaining a relationship against the costs for supporting or breaking the relationship. This characterizes the beginning of a relationship and is where the existence of opportunistic behavior is investigated. The second stage is knowledge-based trust, where the trust is evolving towards increased understanding of the other actor in the relationship. In this stage there are different levels of trust because of the fact that many relationships are satisfied and have no need of further trust. The third and last stage of trust in a relationship is identity-based trust. Few relationships achieve this stage of trust where mutual understanding is used to coordinate the behavior by the actors, which is highly resource intensive. (Bergmasth & Strid, 2004) For an electricity retail company, which has many household customers, it would then be difficult to establish the last stage of trust in the relationship with customers. Moreover, it would be probable that many of the relationships would include knowledge-based trust.

If the transaction has a high risk it can be performed based on hierarchy, when strong control and authority is needed because of lacking trust compared to the level of risk. On the other hand, it can be based on a relationship contract, which is the cheaper way of governance for higher risks, when a very high level of trust has been achieved and detailed internal consensus exists between the actors (Bergmasth & Strid, 2004). Connecting this to the empirical research of energy services by Bergmasth & Strid (2004) is interesting since they have found that energy services, and especially energy service agreements and contracts such as energy advisory services, creates trust since they need long-term interaction. However, trust is only affected positively by time if the electricity company reaches the expectations of the customers and keep them satisfied. (Bergmasth & Strid, 2004) This corresponds to what we stated with that trust is based on prior encounters with the actor. It also supports the effect risk and interdependence has on trust since direct long-term energy services carries bigger risks than other energy services (Bergmasth & Strid, 2004). In conclusion the direct long-term energy services is the type of energy service that is most similar to the automatically controlled systems in SCG where the energy retail company partially is taking over the electricity consumption of the customer.
Trust is also agreed on to be one of the most important antecedents for commitment (Friman et al., 2002; Morgan & Hunt, 1994). The different ways of how to use and build trust should therefore be in mind when trying to understand commitment.

### 3.5 Understanding commitment

From a basic level of trust, commitment can be developed. Development is an important word in the explanation of commitment since a relationship cannot exist without a basic level of commitment. This means that the relationship is started with commitment from one actor that is based on the basic trust they have in the other actor. This is then followed by commitment from the other actor which is based both on basic trust and on the commitment the first actor made to begin the relationship (Blankenburg Holm et al., 1999). De Ruyter et al., (2001) explains that there are two types of commitment, affective commitment and calculative commitment, where the first is based on personal liking and social factors such as trust (Morgan & Hunt, 1994). The second type is based on economic factors, such as costs and benefits, but this type can be less important if there exists a high level of trust in the relationship which increases the affective commitment (de Ruyter et al., 2004). Other researchers agree with the two types but want to add two additional types of commitment, such as the obligation-based commitment and the behavior-based commitment (Sharma et al., 2015). In conclusion, it is though clear that business relationship commitment is affected by a mix of both social and economic structures and that, in some cases, the effect of social interpersonal factors dominates over the effect of economic exchange.

The main factors affecting relationship commitment are shared values (also explained in the section about trust), termination costs and benefit from the relationship. This was first stated as a model by Morgan & Hunt’s (1994) KMV-model, but additionally communication and interdependence has been verified by other researchers (de Ruyter et al., 2001; Friman et al., 2002). The relationship benefit has possibly the clearest effect on commitment. This comes from the fact that an actor seeks to continue working and put more effort into relationships with other actors that can provide superior values (Morgan & Hunt, 1994). If including trust in the investigation five explanatory factors should be used, since trust replaces interdependence. If the actors is in an interdependent relationship no commitment to the relationship will be made if there is no trust, therefore we instead use trust as the fifth main factor. In this thesis the ways these underlying factors affect trust and/or commitment are unimportant, the factors are merely used to help us determine the level of trust and commitment in the relationship between the electricity retail company and the electricity customers.

Commitment also seems to involve risks which demands a certain level of trust (de Ruyter et al., 2001), further implying that increasing either trust or commitment has the potential to increase the other as well. Relationships where trust and commitment are balanced by the actors therefore seem to be to be the most fruitful. This link between trust and commitment may be more two-sided than the KMV-model implies. This is also seen in the empirical findings by de Ruyter et al. (2001) where affective commitment and trust seems to be
essential for working with customer relationships. They suggest inviting and involving customers in company events as possible ways to increase the positive experience and the commitment level of the customers. This seems to indicate what both Morgan & Hunt (1994) and Friman et al. (2002) are saying, that cooperation is an outcome based on both trust and commitment and their underlying parameters.

### 3.5.1 Defining commitment

The foundation of commitment is that the actors sees important value in the relationship and its outcomes (Morgan & Hunt, 1994; Sharma et al., 2015). Strong commitment in any relationship can be recognized as:

”[...] an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it [...]”

Adding that the actor wishes that the relationship will go on indefinitely completes the definition from Morgan & Hunt (1994, p. 23). Being committed is therefore characterized by an interest in maintaining and staying in the relationship (de Ruyter et al., 2001; Sharma et al., 2015). In fact, in consumer research the concepts of loyalty and commitment has been mixed since both have been explained as coming from positive attitudes among the customers who want to continue buying products from that company (Morgan & Hunt, 1994). This results in that the work with the company’s image as trustworthy and promoting its core values can be used for loyalty as well as for achieving increased commitment. Making investments in the relationship is, however, synonymous to showing commitment because improving relationship characteristics also improves the commitment to the relationship from the actors (de Ruyter et al., 2001). Including the perspective of the four types of commitment (affective, calculative, obligation-based and behavioral) concludes that the level of commitment can be estimated by investigating the actors’ interest in staying in the relationship and what resources that are put into the relationship. In the use of the definition of commitment for the context of the electricity retail companies and electricity customers, commitment can be found in the relationship if the parties make exchanges, through for example adaptations or investments, that mainly benefits the other party in the relationship because the actor perceives that the relationship is important in some way and wants to continue it.

### 3.5.2 Commitment gets a one-sided increase with energy services

Pricing methods for energy services can exemplify the possibilities for a company to commit to a business relationship. Apart from cost-based, market-based and normal customer-based pricing, the relationship pricing is another method according to Bergmasth & Strid (2004). This method is based on the premise that some of the exchanges in the relationship with another actor may be unprofitable as long as the total customer commitment is profitable (Bergmasth & Strid, 2004). This adds further complexity to the methods an electricity retail company can choose when exchanging with its customers and how they can show
commitment to the customers. With correct information and understanding about the customers, the value a service or product has for the customer can be estimated with more precision. This leads to better estimations of the investments and adaptations that the company can make to still keep the total customer commitment profitable even if the commitments may be unprofitable in the short term. In this way commitment is made at the time to primarily benefit the customers, but in the long run it also benefits the electricity retail company.

Demand Side Management (DSM) and increased competition are the primary reasons for electricity retailers to have a relationship with customers, where energy services through DSM is a way for these companies to show commitment in these relationships. These services help customers save costs and at the same time also reducing existing and potential costs for the electricity company. Moving consumption from hours where electricity prices are higher to other hours does not affect the profit for a complete electricity company since the electricity price is based on marginal costs for the production. This makes it preferable to some energy companies. There are, however, advantages in decreased consumption as well since it could prevent the need of investing in more production or transmission capacity (Bergmasth & Strid, 2004). Working towards lowering the customers’ energy costs would therefore be a powerful commitment to these customer relationships since it mainly, at least in the short term, benefits the customers. However, calculations of how large the consumption reductions may be together with costs for applying these services has to be compared with the benefit from the load reduction, together with the possible pricing of these services.

### 3.6 Understanding power

Power is a factor which by Brennan & Turnbull (1999) is argued to have a large impact on adaptation in business relationships. Increased power for an actor is though not characterized as promoting efficiency, productivity or effectiveness in a business relationship (Morgan & Hunt, 1994). However, mutual adaptation is linked to effectiveness in performance and when analyzed by Mukherji & Francis (2008) power elements together with the social elements, consisting of trust and commitment, are decisive factors for successful mutual adaptation. Therefore we can say that three main and interconnected affecting factors exist for the work in business relationships; power balance, trust and commitment. These are also the factors that have to be considered to be able to achieve the right level of satisfaction, which is the fourth factor, for the other actor in the relationship.

#### 3.6.1 Defining power

Unbalanced relationships are themselves barriers towards cooperation and long-term business relationships since they diminish the positive effects from trust and commitment. Bergmasth & Strid (2004) explain that energy companies may become dependent on the customers based on investments made in order to fulfill energy services and that energy customers may become dependent on the electricity company based on lacking energy
competence. This could lead to one of the actors in the relationship taking the position of power, which means that the actor has the authority to dictate the terms in the relationship (Bergmasth & Strid, 2004). The level of power an actor has can be described by the resources it controls (Bergmasth & Strid, 2004), such as an investment made from one actor that another actor decides how to use. However, if the actors are interdependent, this has much more positive influence on trust. This comes from the fact that interdependency means that one actor has impact on another actor and if the two actors have a strong interdependence this has to be accompanied with a high level of trust, or else the relationship would carry higher risk (Hadjikhani & Thilenius, 2005; Bergmasth & Strid, 2004). Interdependency would therefore be a way to achieve power balance and power symmetry. This symmetry would induce boundaries against opportunistic behavior (Bergmasth & Strid, 2004), mainly through the accompanied increased level of trust. In the use of the definition of power balance for the context of the electricity retail companies and electricity customers, power balance can be found in the relationships if the parties make effort in the relationship in a process-like manner, where effort from one actor is followed by effort put into the relationship from the other actor.

3.6.2 The interdependency of relationships balance power

Investments in cooperation and interdependence with another actor can be motivated even if they are; substantial and possibly not even transferrable to other actors and relationships (Hallén et al., 1991), or intangible and limiting the flexibility of the actors in the future (Johanson & Mattsson, 1985). But to achieve these relationships, where long-run planning and acting is possible, trust, commitment and power balance within the relationship must be considered. Investments in a business relationship is explained by Johanson & Mattsson (1985) as a marketing investment. These marketing investments are largely intangible which means that the ability to determine the capacity of the investment is low. This comes from the dependency these investment has on the relationship partner. Instead, the advantage of marketing investments comes from the fact that an intangible investment can maintain its value or even increase it over time, through for example experience (Johanson & Mattsson, 1985). Put short, an investment in a business relationship focused on increasing power balance, trust and commitment have the possibility to increase positive effects from the cooperative relationship.

3.7 Exchange relationships as the core concept of marketing

Researchers have argued about that the exchange, from one actor to another, is essential for discovering the content of the business relationship (Bagozzi, 1975; Houston & Gassenheimer, 1987; Kotler, 1984). The same researchers’ included exchange in their conceptualization of marketing, consequently making it synonymous with exchange relationships. In other words, marketing pursues exchanging events in long term relationships.
Basically, the only way an exchange event can be performed is when both actors find one exchange that will leave them better off, or at least not worst off than before the exchange (Huston & Gassenheimer, 1987; Kotler, 1984). In Figure 4 we include the four social factors of business relationships in the decision of what makes the actor better off. They are decisive factors for the acceptance of an exchange offer, since they together create the pre-existing experience of the possible exchange, including both social and economic consideration. Thereby it is not obvious that an exchanged event will be feasible for a specific actor and this would then primarily depend on what the actual consequences and expectation from the parties is before the relationship event (Bagozzi, 1979). If the exchange requires contractual agreements there will also be a certain level of expectations developed for both parties apart from the agreement. After making the exchange needed to complete the contract, this does not necessarily mean that this has fulfilled all expectations, and therefore expectations could impact future relationship events. The results from performing the event depends on the consequences of exchange, which include the value derived from what is exchanged and the value from performing the exchange (Bagozzi, 1979). The value from performing the exchange is further a result of the actors’ behavior, which means that the experience is connected to the social terms mentioned earlier.

![Figure 4 - Including the relationship concepts in the customers' decisions to accept the exchange from the company.](image)

Exchange in business relationships is characterized by demanded return in both the short run and the long run. This means that performing and coordinating activities such as adaptation can be included in the exchange concept. Due to the process of exchange, adaptation therefore also depends on past or current exchanging events that enable future events, and in this case adaptations, in the relationship. Repeated exchange in a relationship can also be seen as an adaptation process, since the actors are both affecting and being affected by one another's needs and wills (Hallén et al., 1991). However, it must also be included in the definition that each event is unique in itself as well as it depends on the earlier events performed, even on events with the other actors.

According to Bagozzi (1975) there are three existing exchanges that define the type of business relationship. The first type is called Restricted Exchange, which is characterized by
an attitude to keep equality between the actors and that exchange in one way should be met by an exchange of similar value in return as fast as possible, no actor shall lose anything on the exchange. The second type is the Generalized Exchange where the exchange involves more than two actors, which means more than one relationship, and the actors form a system of exchange where none receives exchange from and gives exchange to the same actor. Here there is no expectation from an actor to receive equal value directly in return. At last the Complex Exchange is characterized by any amount of connected actors which have a mutual exchange but not necessarily to the same value (Bagozzi, 1975). The two latter exchanging types are further explained by Bagozzi (1975) to develop the Social Exchange relationships when they are connected with each other. The social exchange relationship is explained as the exchange where the value in return may be both intangible and tangible, while the returned value may come at another point of time and from another actor that not necessarily is the actor who the primary exchanging events were performed with. The social exchange relationship includes anticipation of a needed returned exchange in the future, but could result in a returned exchange of other characteristics depending on what happens. The main characteristic of exchange is therefore that every actor involved has an idea of what they would want in return in the exchange, but what it is depends on the type of exchange or relationship the actor is involved in.

3.7.1 Exchange relationship consequences with a narrow perspective

Exchange relationships are largely focused on a dyadic business relationship and further ignores its surrounding business network (Anderson et al., 1994; Webster & Lusch, 2013). This comes from the business network definition that consider changes in the environment affecting the relationship and the vice versa (Ford et al., 2011). This definition of business networks, would in the context specific relationship between an electricity retail company and household customer, mean that new developments of this relationship would have effects on other actors on the electricity market and even other markets. The third of Bagozzi’s (1975) concluding questions in Marketing as Exchange also mentions that social actors and third parties can affect the exchange in a relationship. This would, for the analysis of a Smart Grid project, signify that actors like governmental agencies and retailers of electricity consuming products also are interested in the exchange between the two actors in the focal relationship. The non-business third parties are also mentioned by Hadjikhani & Thilenius (2005) as horizontally connected relationships.
4 METHODOLOGY

This chapter describes the construction process of this thesis study. The basics of research methodology, and therefore also the process of thesis work, is to choose a qualitative method or a quantitative method (Blomkvist & Hallin, 2014). In this study a mixed methods research was used instead, and thus combining both research strategies, which is supported both by Blomkvist & Hallin (2014) and by Bryman & Bell (2011). Since it increases the possibility to complement each method’s weaknesses and strengths, which thereby provides rich and validated results. The reasoning behind that is explained in the section for Research design. In the following section, Literature study, the sources behind the theoretical tools, which were used for analyzing the empirical data, are discussed with focus on the methods used to find the appropriate literature. The two final sections, Quantitative data and Qualitative data, will give the reader an understanding of the reliability and validity of the thesis study and of how the research question was answered by the gathering and analysis of the empirical data.

4.1 Research design

The research questions for this thesis study are trying to find answers and also an explanation to how the relationship between the electricity retail company and their customers will affect the customers’ behavior in the context of electricity consumption and demand response. This is the phenomenon that has been studied in the thesis, which in its nature is a complex phenomenon that needs an explanation in high detail. A qualitative research method is the method best equipped for detailed explaining of complex phenomena with multiple facets (Blomkvist & Hallin, 2014; Bryman & Bell, 2011). The case study, which was an important choice of design for our thesis study, is a common method for the gathering of empirical material for a qualitative research method (Blomkvist & Hallin, 2014). For our thesis study the idea was to test the theories produced by other researchers specified in the field of business relationship research in our specific context on the electricity market. However, since the theories are many and real cases can produce a deeper understanding of how to use the theory, the thesis study was also open to produce changes and new combinations that fit this case better than the general theories. The process used to produce these results was deductive (Blomkvist & Hallin, 2014), since theories from research primarily were used both to create the empirical study and analyze the results. This process had the advantages of fulfilling the purpose and answering the RQ, in the most thorough way, with the help of peer reviewed theories compared with the empirical findings from Sweden’s sole development project for demand response testing on actual customers.

The case study of Smart Customer Gotland (SCG), becomes a case study of the relationship between two actors. These are the electricity retail company, Vattenfall merged with its subsidiary GEAB, and the household customers put together in the project. However, the classification of case study that comes closest to our definition of a case study is the single organization case study proposed by Bryman & Bell (2011). The class involves analysis of information from different hierarchal and functional levels of an organization, which also was
the purpose when including multiple internal interviews as well as the perspective of the customers in this study. Concerns about performing the case study were however focused on the possibility to generalize the results of a case study. For this study it did not imply large difficulties, though, since the purpose of the study was to explain how this specific case distinguished itself from the theory of general business relationship theory.

The outline of the process of the thesis study was created by the development of two perspectives of the research question, the customer perspective and the developer perspective, which sets the boundaries for the literature study and the empirical study. See Figure 5 for the thesis study process. The objective of the literature study was to produce context specific definitions for the main concepts in the theories that were central for the two perspectives of the RQ. These definitions were then used to develop the questions to the analysis of data and internal information, the survey, the internal interviews and to the external view interview. In the later stage the analysis of the gathered empirical data was used to answer how the concepts defined in the literature study affected the two perspectives of the RQ. The methods, further described below, which were used when combining the two perspectives are what make this study a mixed methods research.

![Diagram](image.png)

*Figure 5 - The outline of the thesis process and design.*

### 4.2 Surveying the literature

The literature study was primarily based on the theories and concepts brought up in the background and problem statement to this thesis study. Without considering the two perspectives of the RQ, three main research areas were found to include the earlier mentioned concepts; consumer behavior, business relationships and business networks.
Searching for research articles regarding the background and problem statement had brought an understanding of which concepts that was used at the time for customer and business relationships in the context of the thesis. Simplified the concepts were trust, commitment and exchange. These were found in a simple literature survey of business-to-business articles. This led us into trying to find the basis and first definitions of these concepts in older articles and articles based more on a business-to-customer perspective. With this approach the concepts could be widened and a couple more concepts were added (power, satisfaction and acceptance). In the end of the research for the literature study useful context specific definitions, based on both older and newer articles, were made for the concepts, so that they could be tested in the analysis of the empirical data. Even if there has been a mix of older and newer journal articles, the search has been characterized by exclusively including peer reviewed articles where many of them are referencing to each other. This procedure has been used with care to avoid problems with only including articles that have the same perspective and focus.

The consumer behavior section of the literature study was focused on the understanding of consumers. This included psychological and social factors that influence the decisions made by customers and explain the ways they behave in consumption situations. Especially consumer acceptance got a highlighted position since demand response offers a new way of thinking about electricity consumption. The reasons behind including this section was the need for further research on how social and psychological factors impact the relationships electricity retail companies want to initiate with customers for demand response purposes. In this way the research of consumer behavior was tightly connected to the relationship aspect of the interaction between household customers and their electricity retail company.

### 4.3 Quantitative data

The quantitative research approach origins from the definition of a research strategy that consider the possibilities to generalize through gathered data or information (Bryman & Bell, 2011). It was included in this thesis as it increased the reliability of the actors’ thoughts and actual performance within the interactions in the business relationship, thus not setting the focus on only one of the business actors. This is also argued by researchers (Turnbull et al., 1996, p. 44) around the business relationship area:

“It involves simultaneous analysis of the attitudes and actions of both parties and emphasizes the essential similarity between the purchasing and marketing tasks in relationships”

Furthermore, to conduct this it involved developing a survey, targeted towards the household customers participating in the development project. Likewise, the other task involved the modeling of project data, created with the purpose of analyzing the household customers’ performance during the development project, which were developed from gathered customer characteristics and activity data. Since the quantitative strategy, in this thesis included the household customers’ actual attitudes, experience and actions they complement each other
and therefore provided an overview of the household customer side of the business relationship.

4.3.1 The survey methodology

The number of participating household customers in the development project SCG, have in the later parts of the project, been around 300 members and about 230 have had automated heating system installed and provided by SCG. To gather an overview of the customers’ attitudes in the business relationship, survey questions were developed adjusted for the customer experienced attitudes towards their electricity consumption activities. The focus in this SCG-survey was put on the household customers’ own activity, which was consistent with the purpose. Which is very important in the shaping of questions to get empirical material (Blomkvist & Hallin, 2014). The theme helped us strengthen the validity of the finalized survey questions, since it made the survey questions proposed by us less vulnerable for drastic change.

Our addition to the survey towards the household customers, and to the questions created by the electricity retail companies, Vattenfall and GEAB, were complementing questions suitable for the purpose of the thesis. The survey questions used for this study, which were included in round two of the SCG survey aimed at household customers, are available in Appendix 2. Subjects and factors were put together with embryos for survey questions and were sent to Vattenfall’s survey consultant for rephrasing and structuring. The questions in the survey of this thesis study were put through the same process as the other questions, which was a step that increased the reliability of the answers and results from the survey questions. In this way the original questions were rephrased and structured so that the customers could understand the question and answer in a correct way. Although the survey questions suited for the thesis were included in several processes, we had possibilities to affect the result before the dispatch of the survey. In other words those who first stated the embryo of the question had the possibilities to make last adjustments regarding the structure of the survey questions.

The survey was dispatched by Vattenfall and GEAB by e-mail to the registered customers in the project with a link to the online survey, and was followed up by promotion by the staff in the project. The method of self-completion questionnaire by e-mail is supported by Bryman & Bell (2011). However the downside of the method is that the respondents have no interviewer to ask if there is confusion with what the questions really are asking (Bryman & Bell, 2011). This is a concern for this method that is especially valid when involving customers who do not always have the same knowledge or uses the same language as the person who created the questions. Therefore there is a possibility that some of the answers to a question may be misread when analyzed even if the questions have gone through a process making them as simple and directed towards these customers as possible. However, with a large group of customers in the survey, if the question is understood by most of the customers, this would not affect the results of this study.

Moreover, the second survey (SCG Survey round 2) were strategically chosen to be sent out in March 2015 since the customers then had been given a chance to try out the project for at
least one winter. This was a term that had to be fulfilled since most of the controlling of heating systems is made in the winter season, meaning that the customers would have had a chance to learn about the effects of the systems and their behavior. This would make the customers more prepared to answer these questions.

The survey was in the end answered by 185 customers with automatically controlled heating systems and 46 customers with the simpler visualization system installed. This was an appropriate rate for the project since many of the trends seen in the project have been so strong that this rate of answers from the customers would not change the general characteristics of the analysis. For our study this number of answers were enough to get a general idea of what characterized the customers involved in the project.

4.3.1.1. Operationalization of the questions in the survey

Since the survey sent to the customers in SCG was primarily put together by staff at Vattenfall and GEAB many questions were either irrelevant for this thesis or very basic with the objective to collect data about the households in the project. The questions that were relevant for this thesis were the ten questions seen in Appendix 2, which there carries other numbers than in the actual survey but the order of the questions have still been remained. A summary for the expected results for each question can also be found in Table 2.
Table 2 - Summary of the expected results from the survey questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>Concepts</th>
<th>Expected results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Satisfaction</td>
<td>General understanding, together with other data can tell us what customers define as satisfaction.</td>
</tr>
<tr>
<td>Q2</td>
<td>Satisfaction, commitment</td>
<td>If the customers are satisfied with the commitment GEAB has made to the relationship through support. And if this makes the customers committed.</td>
</tr>
<tr>
<td>Q3</td>
<td>Satisfaction, commitment</td>
<td>How comfort affect satisfaction with the results of the involvement and if commitment through loss of comfort is made.</td>
</tr>
<tr>
<td>Q4</td>
<td>Commitment</td>
<td>The commitment through the effort customers have made in the project to increase their awareness.</td>
</tr>
<tr>
<td>Q5</td>
<td>Satisfaction, commitment</td>
<td>If the cost benefit (the commitment by SCG) that the customers receives have any connection to the general satisfaction and how many customers that tries to appreciate how much they have earned.</td>
</tr>
<tr>
<td>Q6</td>
<td>Satisfaction, commitment</td>
<td>What the satisfaction level of customers lead to. Do they demand further commitment from the company or will it mostly affect their own commitment? How much interest the customers have in these products and services.</td>
</tr>
<tr>
<td>Q7</td>
<td>Satisfaction, trust</td>
<td>How the satisfaction level can make the customers risk their reputation, in word of mouth. Do the customers trust that the companies do what is best for customers?</td>
</tr>
<tr>
<td>Q8</td>
<td>Trust, commitment</td>
<td>Will the customers be committed to find what benefits themselves the most, or is their trust in the knowledge of the company a barrier to finding an optimized solution?</td>
</tr>
<tr>
<td>Q9</td>
<td>Trust</td>
<td>If the general trust in the company is large enough to induce a high level of trust for the system that makes the company in charge of the domestic heat.</td>
</tr>
<tr>
<td>Q10</td>
<td>Trust</td>
<td>If the customers trust the automatic control to find the optimized solution for normal days or if they find themselves more suited for that task and therefore will make own changes.</td>
</tr>
</tbody>
</table>

4.3.2 The data modeling

The use of findings through the modeling of project data helped us to answer the RQ through providing a complementary view of what makes customers satisfied and dissatisfied. Together with the survey, the data can explain which factors in this demand response relationship that has the most effect on the experience customers have in SCG. Since the experienced changes in electricity cost is developed in the survey, the data of the actual economic benefit customers get can tell us if the actual cost benefit customers gets. Thereby if it has high or low impact on the satisfaction and commitment of the customers.

The data SCG collected consisted different characteristics and conditions for every customer within the project and as well of activity data from the testing. This data were not available for public viewing and to be able to use the data for the purpose of this study, further calculations were needed. In this sense the data modeling provided primary data for the empirical study.
As the reasoning behind the survey, the data modeling also had the approach of generalizing the activity and attitudes for the whole group of customers. Analyzing customer segments made it possible to find out if there were large differences between the customers in the complete base for the project. In this way the reliability of the analysis results could be increased and the risk of making faulty conclusions for a share of customers decreased. The customers were segmented by the type of heating system they have and by their consumption level. However, specific differences for a certain segment could not be found and therefore the reliability of the general results are strengthened.

The modeling consisted of two sub-tasks; theoretical cost modeling and actual cost benefit modeling. The first task was aimed at presenting how the Smart Customer Price (SCP) and the automated heating control behaved for a generalized theoretical customer. This would show how these things affected the electricity cost for the customer. With a theoretical typical customer with two load peaks, from the descriptions of the staff in SCG, that matched the price peaks of the daily price curve, a simulated load shift of some size could be made. This first task was then used as the fundament to the discussion about the results derived from the second task where the actual cost benefit was calculated for the customers in the project. In the second task the objective was to understand how the price information, the automated heating control and the activity of customers together affected the actual cost benefit for the different customers in the project.

The main idea of the data analysis was to find periods before the project, which had similarities to other periods during the project. For these periods the electricity costs could then be compared to see possible changes that the project had resulted in. All winter months in 2013 were compared with the winter months in 2014/2015 through comparing the average electricity spot price at NordPool and the average electricity consumption for the customers in the project. This resulted in the choice to compare December 2013 together with January 2014, as the period before SCG, with December 2014 and January 2015, as the period during SCG. Calculations were used to get the correct hourly prices and in turn the correct hourly costs for each of the customers in the project, it did also include summing up the hourly costs for certain periods that would be used for finding the cost benefit. Exactly which parameters that were used to calculate the hourly prices are unimportant since the most important point is to have the same parameters in the calculations of the price both before and during the project, to be able to compare the costs between the periods.

4.4 Qualitative data

The general purpose of the qualitative research approach was to capture the details that were most important from the studied object. Flexibility and including the participants’ point of view were important attributes for our qualitative part of the study, as recommended by Bryman & Bell (2011). The qualitative approach is more time consuming and was therefore more appropriate to use for the study of the electricity retail company, where fewer people had to be included. This approach was also strengthening the richness of the study by allowing more detailed information about the relationship, compared to the quantitative
approach where the focus was on including the whole set of customers. The qualitative data in the study came from performing semi-structured interviews with seven persons from inside SCG and from performing a less structured with two persons from an external view on SCG. The external interviews were focus on the lead questions about the companies’ challenges towards aching demand response from household customers. See Appendix 3 for more information about the respondents.

4.4.1 The semi-structured interview performance

For the structuring of the interview questions for this thesis study, including the respondent’s interests and priorities were important to keep validity of the interview (Bryman & Bell, 2011), even if the interview was somewhat controlled through the interview guide. The interview guide also got general topics for the questions that were coordinated with the subjects included in the RQ. Before the appropriate respondents were chosen, a first step was to analyze the surroundings of potential interviewees, which thus were based on regular thesis meetings with both the company thesis supervisor and the SCG project group staff. These meetings narrowed down the amount of people available, while the focus of appropriate respondents were directed towards those with some degree of involvement in SCG and further on knowledge of the development of customer participation on the electricity market. The structure of the interview and the general topics then considered the activities in preparation for and during the development project SCG. The reason was both to get a complete view of the development of SCG and since some of the respondents primarily had been involved in SCG in the beginning of the project. The last step of the preparation for the interview performance regarded development of a finished semi-structured interview guide. Formulating questions for an interview guide did undergo a process where others had to put themselves in the situation of a respondent, making a pilot guide before doing the last changes of the interview guide. In this process opposition by other thesis students as well as the supervisors helped. The complete process had its base in Bryman & Bell (2011).

A semi-structured interview has similarities to a structured interview or a survey, through having questions with topics and objectives connected to the concepts of the thesis. Performing these interviews has in the study led to various results, since the interview respondents often interpreted the question to fit their expertise. Even if the questions most of the times were asked in a similar manner. This both strengthens and weakens the reliability of an analysis where the answers by different interviewees may be compared to each other in some cases and in other cases was used as a complementary view (Bryman & Bell, 2011). The most important thing was, however, that the interviews as a whole actually complemented each other and therefore could be compared. This did however demand supplementary questions so that all of our perspectives actually were answered. In the performance of interviews for this thesis study the semi-structured interview guide were sent to the interviewees a couple of days in advance. The idea was that this approach would direct the thoughts of the interviewee in the way the interview was aimed to make the actual interview more time efficient by sparing time on explaining the purpose of the interview. Preparing the interviewee also enables answers that are more thought through.
These supplementary questions were both developed during the conversation and some of them developed in advance as preparation and then adjusted after the knowledge of the interviewee, which further is argued by Bryman & Bell (2011) to be natural for the semi-structured interview performance. Regarding the performance of the interviews, these were conducted either by in personal or by telephone meetings with a timeframe of approximately one hour. The interviews were always performed by two persons, where one had the objective to set the focus on the interview guide and therefore keeping the discussion up with the interviewee, while the other person had the objective to keep notes and when necessarily contribute with follow-up questions. Before the interview started, and also in the end of it, three questions were asked intended for the interviewee to guarantee the procedure of the performance. These questions can further be seen in Appendix 1. If then the interviewee accepted being recorded, a transcription were made, which could be sent to the respondent if he or she wanted it. This strengthened the ethics of the study (Bryman & Bell, 2011).

**4.4.1.1. Operationalization of the questions in the interview guide**

The interview guide covers five topic areas developing from the qualitative research. The first part of the interview and interview guide was intended to start a conversation. The second part of the interview guide was focused on the depth of the business relationship, by highlighting the respondent’s opinions regarding both what the respondent mentions as necessary in the relationship and the use of the relationship. The depth of the business relationship is pursued with further details in the third part focused on the obstacles with the relationship in SCG, which also considered the limitations of the business relationship. Furthermore, the fourth part enlightened the experiences and lesson learned from the project SCG. As the respondent then pinpoint specific experiences and lessons regarding the relationship usage. In other words, it is in this part the respondent are supposed to reason about how the reality is different from planning how to approach closer relationships. The last part of the interview guide was used to summarize a limited number of factors that the respondents have argued being important in business relationships, connected to the possibilities of achieving the full potential of Smart Grids. See the interview guide sent to the respondents in Appendix 1 and the operationalization of the concepts with the different questions.

Table 3 summarizes the operationalization of the questions and concepts. In the left column each of the questions is showed in descending order Q1 - Q16. In the middle column the concepts are mentioned, based on the theoretical framework. The right, and last, column represents the operationalization mentioned above, since it is there the expected result is enlightened.
<table>
<thead>
<tr>
<th>Questions</th>
<th>Concepts</th>
<th>Expected results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>-</td>
<td>The respondent’s previous experience with customers.</td>
</tr>
<tr>
<td>Q2</td>
<td>-</td>
<td>The respondent’s possibility for new experiences with customers through their role in SCG.</td>
</tr>
<tr>
<td>Q3</td>
<td>-</td>
<td>Definitions of important concepts for this business relationship.</td>
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<tr>
<td>Q4</td>
<td>Exchange, investment, cooperation</td>
<td>Activities that can strengthen the relationship in a demand response perspective.</td>
</tr>
<tr>
<td>Q5</td>
<td>Commitment</td>
<td>Performed adaptations during the exchanges and activities that favor the customers.</td>
</tr>
<tr>
<td>Q6</td>
<td>Commitment</td>
<td>What the limitations and barriers are towards investing in work with the household customers.</td>
</tr>
<tr>
<td>Q7</td>
<td>Trust</td>
<td>The degree of which the company manages and calculates with risks of activities from cooperating with customers.</td>
</tr>
<tr>
<td>Q8</td>
<td>Temptation, risk, different interest</td>
<td>Relationship destructing events and how these are present in the case specific context.</td>
</tr>
<tr>
<td>Q9</td>
<td>Power balance</td>
<td>How the power position of the company is affected by surrounding organizations and how this has affected the business relationship.</td>
</tr>
<tr>
<td>Q10</td>
<td>Power balance</td>
<td>The understanding and use of the opportunities and limitations induced by the effect the business environment has on customers.</td>
</tr>
<tr>
<td>Q11</td>
<td>-</td>
<td>The new findings in the project regarding the customers.</td>
</tr>
<tr>
<td>Q12</td>
<td>Commitment</td>
<td>The level of investments that is acceptable in relation to the exchange in the relationship.</td>
</tr>
<tr>
<td>Q13</td>
<td>Commitment</td>
<td>Willingness to develop closer relationships in development projects related to SCG.</td>
</tr>
<tr>
<td>Q14</td>
<td>Commitment</td>
<td>The development of the household customer closeness and how it is influenced by the interactions in SCG.</td>
</tr>
<tr>
<td>Q15</td>
<td>-</td>
<td>Importance and urgency of customer relationship development in Sweden.</td>
</tr>
<tr>
<td>Q16</td>
<td>Satisfaction</td>
<td>The definition of satisfaction with the relationship for both parties. Also important factors for continued work to develop the relationship in a long-term perspective.</td>
</tr>
</tbody>
</table>
5 THE BUSINESS RELATIONSHIP IN DEVELOPMENT

The empirical study for this thesis work has been focused on the relationship between GEAB, which merged together with Vattenfall represent the electricity retail company in SCG, and the household customers. It includes the perspective of the customers through a survey made together with the project and through analysis of primary customer data from the project. The quality of the survey and data is discussed in the methodology. The first part presented in this chapter does however concern the perspective of the electricity retail company, which has been studied through interviews with the staff in SCG to collect their experiences of working with customers in demand response for the first time in a real market test. The interview respondents are presented in Appendix 3.

5.1 The challenges for the industry

There seems to be an established individualistic approach in the work performed in the electricity retail companies where much focus is put into using their technical knowledge. The respondents from the industry organization, Svensk Energi, had the opinion that the faster energy companies enter into relationships with other actors and understood the purpose of collaboration with others, the better. These respondents mentioned that earlier collaborations have been initiated with actors surrounding the technical side. This is natural since it regards the foundations for the development on the market. But it seems that developing these solutions is not enough, acceptance from the customers that the product and services are aimed for is needed for final commercialization of the solutions. This is, according to the respondents, the primary problem for electricity retailers to manage at the moment.

The respondents from the industry organization also discussed that there are certain criteria that the companies have to fulfill even if they are developing new approaches to do business. The most important was comfort, which one of the respondents explained as:

"The customer wants it at least as comfortably as he or she already has it, I do not believe in that any other development is acceptable."

The respondents means that in the situation of commercialization and in development projects, even if the company in the beginning often attracts more positive customers that are not afraid of problems, the customers always demand certain improvement. The respondents explained that any deterioration of comfort in the long run will be unacceptable for any customer. However, the respondents also see risks in short-term deterioration since trust is such an important factor for the electricity retailers. As they explained it, trust is a prerequisite if the company wants its customers to listen to, for example, advises on their electricity consumption. This makes it important for development projects to keep up, or even increase, the trust the customers have in the company.
5.2 The electricity retail company’s view of the relationship

To get a picture of how the relationship, between electricity customers and electricity retailers, the most important characteristics can be summarized as a trend of three developments. Firstly the development of closer interactions and relationships with all customers, to provide customers with what they need. Secondly a wide range of offers of smart products and energy services, to be more interesting for customers. At last there is an interest of the electricity retail companies in what happens in the homes of the customers, to make the households more energy efficient. However, as stated by all the respondents, electricity still is a product that is given low priority by the customers, even if it stands for a large cost for larger households.

The electricity retail companies’ increased interest in having a closer relationship with customers is described by a respondent as an attempt to avoid the increased price competition through changing the focus to different products and services instead. The drawbacks with price competition is evidently that it decreases margins of profit for the companies on the market. Another explanation were that these new offerings have other problems, such as a decreased electricity consumption, which results in lower income for the companies. The explanation to why these offerings are accepted by the companies, was because companies needed to find a new foundation for conducting business on the electricity market. This is why thinking about customer relationships has become more usual.

To describe the ways the companies worked not many years ago one respondent gave an example:

“Previously the responsibility of the electricity retail companies have ended where the electricity consumption meter was [...]”.

This example meant that everything that happened in the household of the customer, including the electricity consumption, was the responsibility of the customer and was not interesting for the electricity retail company. The respondent continued with that the only interest the companies had in the customers, in the past, were their ability to pay the bills. Now they are more interested in extending their responsibility into the homes of the customers to assist them in achieving a sustainable consumption. In the respondent’s own opinion this change could be seen by the increased amount of offered energy services and products to household customers in general. The breakthrough for this trend came, according to one respondent from the project, in 2009 with the “Swedish metering reform” which gave the energy advisors greater possibilities to give customers more accurate advises. See Chapter 2 for further explanation of this reform.

It seems that the development made by electricity retail companies has not yet been as visible amongst the behavior of household customers. Multiple respondents describes customers as generally unaware of the actors and events on the electricity market and that the customers give their electricity consumption low priority as long as there are no problems, such as electricity outages or price spikes. One of the respondents said that if there were actual relationships between customers and their electricity retail companies, the relationships were limited and characterized by problem related questions. Another respondent explained that
the reason to why the electricity market is Sweden’s most regulated deregulated market is because customers have difficulties to understand what they pay for, and even problems to understand the invoice. However, it was also mentioned that when the customers needed to get in contact with the customer support at Vattenfall this often increased the customer’s satisfaction with the company. The respondent continued explaining this fact with that the customers who get more involved with their electricity retail company also become more satisfied with the company, but that few customers actually reach this level of contact. From the customers who have had contact with Vattenfall, one respondent have experienced that today the customers demand personalized and specific advises and not the generalized support and advises that the companies provide at the moment.

5.2.1 Preparations, promotion and customer contact

The recent development on the electricity retail market implicates a drastic increase in visibility for the electricity retail market. The reason to this is that interaction between electricity retailers and household customers is rare, if excluding the interaction by invoices. The underlying problem is understood from the following quote:

“Selling electricity today means selling an unglamorous product […]”

The quote is apparently significant for the electricity retail market because most of the respondents imply this and some of them explain that this is the reason to the trend of an increase of supplementary energy products and services on the market. Furthermore, it were explained that energy and electricity is so natural to have without thinking about it. This results in that the customers do not prioritize it over anything. Instead it is explained that the customers who have bought products, such as solar panels, heat pumps or visualization systems, tend to be more satisfied with the relationship to Vattenfall than customers that only buy electricity. Therefore it confirms that customers do not have a specific relationship to electricity retail companies that they only get an electricity bill from. This comes from the fact that electricity only exists in the background of more interesting and understandable products. However, with an increased exchange with customers through new smart energy products and energy services the electricity retailers also have to face new challenges. One respondent mentioned that even if SCG is a development project, it needed careful preparations of the technology since getting a bad reputation in a customer test also could hurt GEAB’s general reputation and customer satisfaction. This means that an electricity retail company can develop new business solutions, but have to make them as reliable as the electricity they sell. Another respondent referred to the same fact and pointed out professionalism that have to be characteristic for every company that wants a good relationship with its customers.

5.2.1.1. The importance of simplicity

Involving customers in the company’s development depends on the latter actor abilities to simply explain how their customers can achieve what is most interesting for them. There are no guarantee that reduced costs to be the single benefit that is worth the effort of a customer.
But in the case of demand response development it was pointed out that customers have showed a wide interest in decreasing their electricity costs. This was specified to be a natural cause of customers to come to the event, listen to the presentation and later sign up for the project.

Even though decreased costs have been an interest other respondents imply that the customers do primarily prioritize an abnormally costly invoice to pay, since the customer do not care about if it depends on the amount of kWh spent or a high electricity price. In the work with energy advisory services it was explained that this is the reality for energy companies, customers that want to get help to decrease costs but have limited knowledge about the subject and further finds it complicated to manage. Therefore they seek assistance from the company. It was added, that customers sometimes felt that the situation of demand response was too complicated to manage due to the lack of knowledge and experience. They therefore turned down the opportunity to reduce their electricity costs, since the complexity became a threshold. When interpreting this comment it can be understood that the respondent mean that customers have a large knowledge gap. The gap between the knowledge customers have and the knowledge customers need, to understand how their behavior affects their costs, sometimes feels too large to overcome for the customers, and that the possible cost savings are not worth the effort.

5.2.1.2. Educating the customer in person

Most of the promotion of demand response has been required to be performed as an educational process where meeting the customers in person was well spent money. One respondent explained that the project aims at creating new habits and knowledge for the customers and educating them in the best ways to save money. He gave an example of customers that, when the heating costs becomes high and instead of investigating where all the electricity and energy is consumed, focuses on the different possibilities to change the heating system and starts comparing district heating with electrical heating or pellet fueled boilers. He explains this behavior as:

“You only investigate what you have knowledge about [...]”

However, it was also mentions that the number of customers who become aware of their own consumption is increasing. He continues with that the slow progress can be explained by a low electricity price and two warm winters and if it would have been the opposite the customers would be queuing into the project. It were further explained that another disadvantage that the electricity market has is that the customers pay for the usage of electricity after they have used it and that customers unfortunately never expect the next electricity bill. Even though the electricity market has these downsides, multiple respondents explained that meeting customers face-to-face has been a successful method to overcome these problems. One respondent mentioned that this way to communicate with customers was important to get the customers to understand what they were signing up for. The respondent continued explaining that the customers got a chance to make personal contact
with the project and ask their specific questions, at the same time the project could sort out the right customers for the test.

5.2.1.3. The situation of the Smart Customer Price (SCP)

Other preparations included the investigation of possible future market developments. Exemplified by a couple of respondents the price model, SCP, had to consider probable events such as an increased share of volatile electricity production to be somewhat innovative and at the same time keep the structure regulated by governmental agencies. One respondent described the process of finding the appropriate price model for the project as:

“The price model that was developed, even if it took some time, was one of the most important activities [...]. The price is the only lever we have towards the customers.”

As understood by the interview, the development of SCP had some criteria stated from the different actors in and surrounding the project. This did apparently limit the ways the project could develop the model to make it adapted for this particular situation even if some improvements could have made a large difference. As mentioned previously, the customers unfortunately had difficulties to understand much of the electricity market and therefore also the pricing on it. Even if the price model is the most important lever it is difficult to use in a way that the customers understand and interpret in the right way.

5.2.2 Developing the approach of teaching and controlling

Multiple respondents had experienced that the knowledge customers have about their energy consumption still is limited, even though energy efficiency has been a trending subject. Especially there is limited knowledge when it comes to the actual difference between large and small energy consumption sources. One respondent explained that in general much of the customers’ focus have been directed towards stand-by electricity consumption, which actually is a small consumption source. Instead the focus in SCG of customers is directed towards the systems where the efficiency measures have the most effect, the systems considering heating and especially space heating. Another respondent mentioned a similar misdirected focus of customers where the customers are guided by mass media to compare prices between electricity retailers. What the respondent means is that more money could be saved if the customer instead would investigate their consumption of electricity, something that also was mentioned by multiple respondents. The respondent concluded that the cheapest kWh is the one you do not use at all.

5.2.2.1. The challenge to customize sustainable dialogues

Some of the respondents argue that these kind of energy services, that the electricity retailer offer, can be associated as an understanding of an abnormal behavior. Firstly, this is confirmed from a sales perspective offering smart solutions to the customers to increase their
ability to cut down the electricity consumption, and hence it becomes a result of decreased margins for the electricity retail company. Secondly, it is confirmed by another respondent from the electricity retail company which emphasizes the customer understanding as:

"The household customers cannot believe when the electricity retail company asks them to reduce their electricity consumption, and thus reduce their costs, by participating in a development project towards demand response."

In this sense the respondent means that it is the company that charge the customers for their electricity consumption, while a normal behavior from companies, in general, is to seek profit out of their consumption. This is the view that the customers often have regarding their relationship with companies, and it is therefore the dialogue between the two partners that have to be performed differently. In other words, this intends for increased focus on energy services.

However, as developing closer relationships is foremost associated with these energy services the electricity retail companies have to consider the dialogue to not include too much information at once. One of the respondents mentions that with too much and complex information in a short timeframe against the customers, this is often resulting in confusion and thus there is a risk that some choose to not be a participant in development projects. Therefore, information should be strategically planned directed towards the customers when it is appropriate to conduct these, if the information shall be more or less frequent. This is further a task for the electricity retail company to consider when energy services are performed. Furthermore, the appropriate information have to be understandable for the customers, meaning that the information have to be simplified from the complex information. Even if some information is obvious for those who frequently work with these tasks, it cannot be transferred directly to the customers.

Another perspective on energy advisory services is that customers seem to rely more on the advices from a trusted source. A couple of respondent explained that this is why the customers in SCG more often have turned to GEAB for advises and help. The project had tried to promote GEAB as the main support in technology related questions and an energy advisory expert from Vattenfall as the main support in behavior related questions. When the customers instead have turned to GEAB they have got satisfactory advises and therefore never turned to the expert. One respondent mentioned that offering services from an expert is difficult since customers feel insecure and think of themselves as dumb in that situation. Interpreting this explains that customers rather turn to a well-known instance that they already have been in contact with.

5.2.2.2. The disadvantages with increased contact and exchange

There are, though, risks for the electricity retail company with being as customer oriented. One respondent have experienced that the customers appreciate the increased contact and exchange with the electricity retail company and that they are interested in having even more contact. However, this increased contact and exchange result in increased costs. The
respondent continues explaining that the cost per customer is increased in the project, but that one have to bear in mind when there is research and development in focus that there are problems that would not exist when the products and services are commercialized. Another respondent mentioned that with such a complicated project together with customers that have low knowledge it is not unusual with supporting a customer for a couple of hours over telephone or by doing house calls.

It was exemplified how difficult it can be to support and teach customers in these subjects. A customer called the support and questioned how the meter could show such a high consumption at the most expensive hour during the day, when the control system should decrease the consumption. When the support started to ask questions about what else had been going on in the house at that time, the customer remembered that they had been cooking, vacuuming and dishing, which of course had increased their consumption. The same respondent continued explaining that in another case a customer had got a new heating system installed in his home. The customer continued to have problems with low indoor-temperatures even though he continued to use his fireplace and still noticed that the electricity bill increased. When joining the project the customer found out that the heat pump cooled the house down if the indoor-temperature surpassed the reference temperature of the heating system. Both examples, which in a way characterized the general support, contribute to the view of that customers have low knowledge about what happens in their own homes. All in all, the increased contact with customers, together with the large knowledge-gap customers have in these subjects, needs cost effective communication that still is personalized and simple.

The customers have, in this project, got a chance to really understand how they are behaving and how they consume electricity. One respondent said that the project had been an eye-opener for many customers and that the customers now have an opportunity to, by themselves, find the answers to why they sometimes get high electricity costs. The same respondent explained that not even all staff working at the energy companies have knowledge about these subjects, sometimes it is even difficult for the staff to explain the difference between kW and kWh and that this makes teaching customers even more difficult.

5.2.2.3. Energy security in the household

Some of the household customers have not seen, or experienced, what positive effects the application can bring in addition to price signals and the ability to see and control their consumption. In an exceptional case, one respondent gave a positive example of when one customer during the development project experienced that something were wrong with the electricity consumption at home and therefore contacted the electricity retail company.

It appeared that the customer was out of town during the day when the customer contacted the retailer, and the reason was due to an unusual temperature showed in the application. Since there were no faults with the application, the customer asked the support if there were any possibilities to see how the error had occurred. The case was that there were construction work next door that accidentally had triggered the customer's residual current device, resulting in that the heat was turned off, hence the reduced temperature. Since the metering
devices in the households run on battery it could warn the customer, which in a situation without the application and system could have resulted in unnecessary damages. Even though this example belongs to the unusual cases, the content of it is interesting since the application could further increases the security at the household and thus keeping those customers on a satisfied level. However, this kind of problem solving requires a high level of support.

Another respondent admitted that customers were uncertain in the beginning of the project regarding how the installed systems would impact their heating systems. It was an issue for some of the customers and therefore could require direct support both for larger problems, exemplified in the same matter as the bean mentioned above, and smaller problems where the customer in fact could have solved the problem by themselves.

5.2.3 Learning by doing and having hindsight

The cooperation with customers has meant new development and suggestions for the systems, which in one case has become an idea for a new project. According to some respondents, one participating customer had noticed the church to be possible of cost reductions and an actor that could be interested in a development of the automated systems used for demand response in SCG. As previously told, the customers have had the opportunity to give feedback or advices during the development. Integrating with the customers have resulted in more available information that the company can use, instead of only considering the information regarding their electricity consumption pattern. One respondent stated this fact as follows:

“To have customers participating in the development process is the ultimate situation one could achieve in a product and market development context.”

That quote points out a need that electricity companies have, more cooperation with their customers to be able to adapt their offers. The same respondent also mentioned that in other discussions the respondent have had with other electricity companies in Europe, they had found that many electricity retail companies have a very deep knowledge of electricity consumption and usage. However, the respondent did not feel that anyone really used that competitive advantage. This could mean that an electricity retail company showing its competency for its customers would convince them to rely on the company in more situations.

Multiple respondents found it interesting and pleasing that the customers have been very satisfied with the project. The reason to this, mentioned by the respondent and discussed earlier, is that the project have been carefully listening to the demands and needs of the customers to solve support issues as fast as possible. However, in the analyzing of how support costs could be decreased the project manager of SCG explained an idea that did not make it into the project. The project group had discussed the use of social media and building a community for the customers in the project. Within an online community the customers could have communicated with GEAB and the project, but also with each other. In this way
some of the teaching and supporting could have functioned without the involvement of the companies in the project. The idea was never realized because of the larger need of supportive house calls and that this kind of community still would demand resources to control the community and answer questions. Interpreting the example it would be an interesting solution to decrease support costs if the technical support would not have been so demanding.

A couple of respondents explain that customers today want more specific advises adapted for their specific conditions and another respondent explains that one possible development of the products would be to increase the focus of the information interface to present abnormal events and behavior, if the consumption or systems do not behave in a way that the customer approves of in the normal case. Interpreting this means an increased focus on services connected to security adapted for the specific customer.

5.2.3.1. Commitment affects the level of cooperation

The electricity retail company have to, according to one of the respondents, show commitment towards the customers, else selling these kinds of products and services aimed for the right segment becomes a difficult task to solve. Furthermore, if the company shall be able to automatically manage customers’ consumption there have to be basic knowledge of what you get involved in. On the other hand, the same respondent argues for a lower degree of commitment coming from the customer as follows:

"While the customer need to be partially committed, we live in a society where we do not have the time to commit us in all. Energy is also the last thing we become involved in and think of, which makes it anytime simpler if it is operating automatically."

Considering what been mentioned in the quote and above, the respondent claimed that the commitment of the electricity company included the ability to make the customer committed. But, in the same situation the respondent mean that it is farfetched to get the customer more committed since they have many more urgent matters to attend to. Furthermore, it is agreed from others as well, that household customers have not always the ability to commit all the times. These respondents adds the problematic of which the customer shall determine how they would decide their living, based from price information for the next day becoming available 15:00. It was exemplified that it could be too late for some customers to decide one day in advance how they shall plan their living, because of other more urgent matters. It was stated that more time to plan could improve a customer’s ability to adapt and control its behavior according to the information. With the educating of the customers in a relationship it could therefore be probable that general plans for the daily consumption specifically for the customer to improve their general behavior.

Before the electricity retail company have believed that there is a certain consumption patterns for certain households, while now the knowledge have increased and moved to considering the households in more detail. This have resulted in that the consumption
patterns, in some cases, are not applicable for the individual household when it is analyzed and this is due to parameters in number of family members, new or old heating systems, and what other conditions different households have. Furthermore, in order to reduce customers wasting of energy and their wasting of money both the resources and time spent are further a priority if the company shall be able to reach the climate targets.

The cooperation, during the development project, have then meant much time spent per customer on support, which is not an unusual process. But in comparisons with a possible commercial products and services these are packaged differently and therefore shall lead to less amount of time spent on support. The product and services should be including right information directed towards the appropriate customer segment, simple information and simple use of it, thus making these less time spent possible from both sides of the relationship. In this sense the respondent exemplified that the criteria for customer involvement in SCG were not understandable for them, which lead to increased amount of problems that the support had to solve. Therefore the company would have to be completely confident that the information are understandable, else the company ends in a situation where the support have the most responsibility and hence, it is probable, that the costs increases for the company. Furthermore, the same respondent argued that this requires a close relationship including further knowledge of the customers to be the most important task.

5.2.3.2. Both actors enjoy their current state of day-to-day practices

To conclude the possibilities to commercialize demand response, only external actors and events can make demand response interesting for electricity retail companies. One respondent stated that customers are too unpredictable to be able to rely on their ability to participate in demand response. Interpreted, the respondent means that customers have too small incentives and have routines that are not easy to break. The same respondent continued explaining that in a future case when there is a lack of electricity production and there is a very cold winter, there are, however, financial incentives for electricity retail companies to get demand responsive customers to cut demand peaks. There have been situations in Sweden in the past where this situation have occurred and without demand response this caused the electricity companies huge losses. If there is a risk for this to happen again companies could invest huge amounts of money, but now no companies or customers see this as a potential risk in the near future. In this situation the respondent primarily found solutions with remote control as the most secure, even if the incentives for the customers to be involved in demand response would increase. The respondent concluded that if the customer understood the reasons behind the remote control and at the same time got a small incentive it would become possible to implement this. However, these possible situations depend on external factors, such as policy decisions or if there were some sort of crisis, and before this demand response does not seem beneficial for either customers or electricity companies. As one respondent mentioned:
“The energy companies, are not very proactive in this industry and not good at developing new services to customers, we are a bit sluggish and slow, but what you should know is that when this industry faces new regulations then we move fast.”

The respondent also explained that policy makers and governmental agencies sometimes make regulations that they think are good for the customers even though the customers never have demanded or even thought of it before. In the relationship context these comments could be understood as that the electricity retail companies are well-adapted to the processes and demands of policy makers, but not as well-adapted to the demands of customers and this comes from that the whole industry is a bit distant from these customers.

5.2.3.3. Collaborations must be initiated to enhance available appliances

The final view of the perspective of the electricity retail company comes from the respondents at Svensk Energi. These respondents find that the market for smart appliances, and especially the ones directed towards energy smartness, soon have to be sorted out. They explained that customers face too many types of companies that offer these solutions and that if all these companies do not live up to the standards of the customers the trust customers have in these types of appliances will fade. They had seen signs in other discussions that implied energy companies as the most appropriate actors to offer these types of solutions, because of the foundational trust customers have in them. However, the respondents also said that the electricity retail companies probably have a need to cooperate with other manufacturers of appliances for household customers that have more experience from working closer with customers. Interpreted this cooperation would help the electricity retailers to get on a development fast track that leads to increased knowledge of how to approach customers with these appliances but without risking to lose customers trust on the way.

5.3 The household customers’ view of the relationship

When it comes to the customer perspective of activities, primary data has been collected through the customer conditions by survey and data model, while each of them are focused on the automatically controlled customers, the Auto group, and those that only have the visualization system, the EW group. In the survey, the customers’ own experiences regarding the activities are mentioned and the modeling of data includes customers’ actual behavior. These two approaches can complement each other when considering their place in the business relationship for demand response. More information about the groups in this project can be found in Appendix 4.

The survey was answered by 185 customers who had the automatically controlled heating systems installed and 46 customers with the simpler visualization system installed. It focused on their experiences with the systems and the entirety of SCG at that point. The survey was sent out to the customers in the middle of March 2015.
5.3.1 The expected satisfaction level

In the electricity retail company’s activities towards their participating customers, the customers have had an above mediocre attitude regarding their experience of the activities. The highest percentage (28 %) of the customers rated their satisfaction to eight out of ten and even though the customers had experienced mixed levels of satisfaction, the customers in general were satisfied with the project. Various reasons, connected to the objectives of demand response, were mentioned by the customers to explain why they were satisfied.

The average customer satisfaction level is higher for the automatically controlled customers in comparison with the EW customers, which had to control their consumption manually. Regarding the Auto group the two highest percentages of experienced satisfaction comes from rating eight or seven on their satisfaction. The two of the highest percentages for the EW group were set to five respectively six. This also meant that the average satisfaction clearly was higher for the Auto group, see Figure 6. Notice that this relation was found between the segments even though the EW customers had less complex technical systems installed that could malfunction.

![Figure 6 - The general experienced satisfaction customers have experience in SCG after participating for at least one winter. Q1 in the survey.](image)

The technical and educational support from the electricity retail company (GEAB) has been necessary for SCG, but there is a distinct difference of whom that has the actual need. Most of the customers from the auto group have needed support at some point in the project. The other group of household customers is, however, not in the need of support on the same level, since most of the EW customers had not faced the support offered in the project. What is more important is, however, that when there have been a need for support, both the segments have had a positive experience dealing with the support. For those customers that had the need of support, the average satisfaction with the contact was for the auto group and for the EW group, 8.1 and 7.6 respectively. With this relatively high, compared to the general satisfaction mentioned earlier, score on satisfaction the comments from the customers also were positive. The customer satisfaction seem to depend on that there has been an immediate conversation resulting in the problem being solved through telephone, by visiting the
electricity retail company, or by a house call from support staff. In general customers appreciated quick problem solving, or at least getting some sort of help quickly. However, the customer’s problem might be complex to solve and therefore, as some customers mention, they appreciate being updated frequently on how the solving procedure progresses.

5.3.1.1. **Asking the customers about their level of comfort**

When the household customers answered if they had experienced any changes in comfort, the majority of the respondents answered “No”. It was more common, however, that those who answered, “Yes” were customers in the auto group (27%). Compared to the few customers in the EW group that had experienced some decreased level of comfort (4%). For those that answered that the involvement in the project had an impact on their comfort level, the arguments were that the comfort temporarily had changed in some way.

5.3.1.2. **The customers understanding of changing cost**

The household customers’ experiences regarding if the involvement in the project had any effect on their energy costs, are also followed by different results. Especially because a large portion of customers did not even have an opinion about it. In total, almost half of the customers had experienced a decreased energy cost. However, many customers found it either difficult or uninteresting to determine the effects, since 29 percent had no opinion on the matter.

However, when looking at the two segments separately there are distinct differences between their understandings of cost changes. For the auto group 52 percent had experienced reduced energy costs, while the number of EW customers were fewer. The opposite relation between the segments for the customers with unchanged costs indicates on a significant mix in perceived cost reduction. The shares of customers who had no opinion was however more similar. This shows that many of the customers still does not find their energy costs interesting enough even if they have signed up and got involved with the project, or that making comparisons between invoices do not provide the customers with enough information whether they have lowered their costs or not. See Figure 7 for these statistics.
Moreover, the Auto group is alone in having customers for which the energy costs have increased. The customers who have seen increased energy costs, are all coming from the Auto group. There is a possibility that the automatic control systems can make the energy cost slightly higher if the conditions of the house or the heating systems are especially difficult and the customers have made overrides to the control scheme, see Appendix 4 for more information about these systems. However, more likely it could be a temporary total increase of consumption that has made the costs increase.

5.3.1.3. Future expectations that have been developed during the SCG

The customers are foremost opportunistic when their expectations for the future, beyond the development project, are questioned. Customers wanted to continue using the products from SCG after the end of the project. It is thus evident that some of the customers find this energy service provided through these products from SCG useful and this could encourage them to keep monitoring their own consumption and to continue the relationship with their company. But these customers could also see an opportunity to continue take advantage of products that had not cost them anything.

Additionally, the customers would recommend participation in SCG to others in their surroundings, like friends or colleagues. Hence, it follows the same trend considering their thoughts about the future expectations. This comes from the high percentage (81 %) from both of the customers segments that rated it as a probability of six, or higher, out of ten. See Figure 8 for detailed statistics. Bear in mind those customers that argue to have the willingness to recommend consequently puts some of their social reputations at risk, since the development project does not guarantee the customer to achieve a better situation.

Figure 7 - The customers own views on how their electricity costs have changed because of their participation in SCG. Q5 in the survey.
5.3.2 The awareness considering overall energy tasks

When the household customers get to describe their energy behavior, some explain that they have not made a significant change, since they already had a high level of knowledge and put much effort into their energy behavior before the project. A majority of the customers have, though, experienced a change from the point when the devices were installed until now, see Figure 9. Some of them, however, remarked that this has not necessarily meant a changed behavior at all times. These customers that rated a lower degree should, however, be handled with care since it may as well depend on the pre-existing awareness and knowledge as on how well different technologies and products increase the awareness. Instead the focus should be on the fact that the project has increased the awareness of most of the customers beyond a mediocre level. When analyzing each segment separately here the auto group once again had a higher average (6.2) compared to the EW group (5.2), making the satisfaction somewhat connected to the increased knowledge customers get.

*Figure 8 - The customers’ willingness to recommend participation in SCG to coworkers and friends. Q7 in the survey.*
5.3.3 Manual changes of the controlling scheme

The automatically controlled household customers have the ability to impact their consumption patterns by either changing their current control scheme or have the ability to manually customize the pattern in the scheme, i.e. performing an override. Bear in mind that the activity of the auto group can be related to their interest in changing their behavior, while it also considers "what is best for yourself at the moment" criteria, i.e. the needs of the customer. Moreover there are different developed schemes that the customer can choose from and these include the levels normal, comfort, economy and economy plus, which each focuses on improving the parameter that the name of the scheme represents.

There seems to be a low interest from the household customers in choosing a suitable control scheme level, while parallel with this activity there is less understanding of which scheme they currently are using. The customers that have changed their scheme (30 %) are fewer than those that have remained with the original during the development project, while those who do not know if they changed their scheme remains even fewer. It is, however, remarkable that a third of the customers have not noticed which scheme level they currently use. Apart from that the customers, in general, seemed to favor the pre-installed normal scheme level, while fewer customer at the moment used other levels to achieve more comfort or more cost savings.

Along with the low interest when it comes to the controlling scheme regarding their heating systems the customers have an above mediocre trust, an average of 7.2, towards the automatic controlling. But few of them have had a very high score on trust. The controlling of the heating systems of these households seems difficult since the comments customers gave to why they did not trust the controlling sometimes were contradictory. Even if some of the customers distrusted the systems the reasons amongst these customers differed.
Apart from the possibilities to change the control scheme, the customer had further possibilities to manually customize it if needed, as mentioned earlier. Most of the customers (69%) had used this opportunity. To compare these changes with the trust the customers had in the control systems it was, however, more interesting that 39 percent of these customers had made manual customizations continuously to the daily updated schemes. While the rest only had made changes sporadically.

5.3.4 Moving consumption for little money

In the theoretical task of modeling the customer data, simulations of SCP’s effect on a changed consumption pattern from a typical customer had to be developed. A typical price curve, with two peaks, from an actual date was chosen together with the consumption curve of a customer that had a similar pattern. However, since the electricity spot price is low, the characteristic price curve for the simulation did look somewhat different from the visualizations that had been developed for the project. From enhancing the variations in the spot price and adding a grid tariff that makes consumption at daytime more expensive, called time tariff, a more variable price with two distinctive peaks during the day was the goal (Svalstedt & Löf, 2014). Comparing Figure 10 to the goal, we see that the actual SCP curve was almost completely flat during the daytime, while the distinctive parts where the transitions between nighttime and daytime.

![Figure 10 - Actual SCP curve for 4th of March -14, including enhanced spot price, time tariff and taxes.](image)

In the simulation of a complete load shift, moving 100 percent of the load, from the two peak hours to the following two hours, this typical customer could save less than one SEK during that specific day, which is less than one percent of the customer’s costs for that day. For a complete load shift that instead was moved to the hour with the lowest price this typical customer could save over two SEK, being above four percent of the costs for that day.

Compared to the real activity from customers in the project it is yet again clear that customers get better results if they move their consumption to the nightly hours. The customers that had decreased their costs the most during the project had also increased their share of consumption of electricity during nighttime. The reason for this is explained by the
price curve used in the simulations. Since the spot price is so low the time tariff is the part that primarily makes the price vary between different hours. However, only a few customers have been able to make that type of load shift which has led to that most of the customers have not gotten any significant cost decrease. The costs probably would appear to be the same as before the project, since the customers have experienced difficulties to find the exact effect from the involvement in the project. This probably comes from that these results are masked by monthly average price variations and that customers change their amount of consumed electricity between months.
6 SUMMARY OF CURRENT AND FUTURE RELATIONSHIPS

Through the both actors’ perspective, of their understanding regarding the relationship, there are further possibilities to summarize what has been achieved and what has to be improved to get a sustainable relationship. The achievements explain the current situation for the relationship, but are not strictly related to the general achievements in SCG. By the achievements there are suggestions pinpointed, by the respondents, for continued improvements for future relationships. By creating the necessary foundation for demand response, improving the relationship and to provide the view of the actual impact in this relationship. This chapter therefore contains the summary of the business relationship and thus an overview of the general development towards demand response.

6.1 What characteristics have been achieved?

The work in SCG has an objective to find out how demand response can be implemented in customers’ consumption patterns in practice. In a business relationship perspective the project has already determined that the possibility to increase customers’ interest in the electricity consumption is by convincing the customers that there are benefits in knowing about your consumption patterns. This would, in the long run, mean that customers can be convinced if the company can provide education and have a regular basis of information exchanges where the information is adapted towards the customers’ primary interest with having a relationship with the electricity retail company. For demand response and other more complex smart energy offerings the primary interests could be economy, environment, and new technology. Customers primarily seem to get interested in their electricity consumption when their favored interest could be fulfilled. This is something that the electricity retail companies have not been able to do by simply selling electricity, since the availability of electricity does not depend on the electricity retail company. In SCG, when GEAB has shown an interest in what happens in the households of their customers and started to educate the customers, the customers have got increased satisfaction which could be interpreted as demand response have the potential to make customers interested in having a relationship with the electricity retailers.

More complex energy offerings, such as the ones used for demand response, has potential to strengthen the relationship to the customers. They can also have the ability to increase the interest from people that are not yet customers to the specific electricity retailer. As one respondent explained it, the customers seem to have started to trust the company and that GEAB wants to achieve the best possible situation for its customers. The respondent said that the customers can get an understanding of that the company really cares about the future and does not only want the customers to consume more electricity. So the approach used in SCG could be successful in both increasing the customers’ trust in the company and knowledge about the energy systems.
6.2 How should the relationship be improved?

One development that was mentioned by a couple of respondents was the development of services that could work without developing and installing hardware in the homes of customers. The respondents mentioned that customers, in most cases, are not prepared to pay large amounts of money to get a product that will help the energy retail company to continuously provide energy services to the customer. The savings the customers possibly could get in a near future are quite low. A lower price for the solution would then be the one way to make it interesting to buy for the customers. The reason to this would be that customers demand economic incentives that covers at least the cost of the product.

It was also mentioned by the respondents that this type of product, without any hardware, would not demand as much support in the homes of the customers since the source of the product is located in a centralized facility. In relation to other empirical findings it seems that a centralized product available online could decrease the costs of the development of the product, decrease the need of customer support through house calls and increase the simplicity of handling the product. However, evidently this solution would not be as present to the customers as a product that is installed in their homes. Even in this case it would be important for the electricity retail company to have a closer relationship with the customers, since the risk is that the company otherwise stays invisible for the customers and that the offerings from the company continues to be uninteresting or even unused.

The strategic elements in Table 4 summarize the other suggested improvements and developments that the interview respondents thought could be valuable to bear in mind when trying to implement products and services for a demand response purpose on a larger scale, while improving a business relationship with the customers. The thoughts did, as the example discussed earlier in the section, consider offering something that make the customers better off and that at the same time limit the costs of the offering and accompanied services. The strategic elements are characterized by one of two themes, support or customization. These are the main discussion points from the interviews of how an electricity retail company could work with household customers to achieve as high customer satisfaction for the commercialized product as the development project has got. In some cases the strategic elements could complement each other while in some situations the strategic elements have conflicting objectives, especially if they have different themes. The common ground for the strategic elements are that they focus on different ways for the company to show commitment towards the customers to relieve the customers from needing to put too much effort into the usage of the product or service.
Table 4 - A summary of the mentioned ways for the electricity retail company to improve the relationship offered to customers with the product or service.

<table>
<thead>
<tr>
<th>Strategic elements</th>
<th>How it should be used</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Improve the feeling of closeness in the relationship by increasing possibilities for interaction with customers. Also widen the areas of which the company can help customers.</td>
<td>Support</td>
</tr>
<tr>
<td>Businesslike/professional</td>
<td>Offer products where the risks for failing is minimized. Also offer the appropriate product for the appropriate customer.</td>
<td>Customization</td>
</tr>
<tr>
<td>Customer dialogue</td>
<td>Give customers the opportunity to ask specific questions and respond to the information from the company.</td>
<td>Support</td>
</tr>
<tr>
<td>Commitment</td>
<td>Clearly show willingness to provide what is best for customers and openness to every question that arises in the relationship.</td>
<td>Support</td>
</tr>
<tr>
<td>Packaging</td>
<td>Create offers adapted to segments with appropriate incentives and information included in the offering of a product or service.</td>
<td>Customization</td>
</tr>
<tr>
<td>Simplicity</td>
<td>Create adapted products/information that, through segmented adaptation, is presented to the customer in a way that is understandable and enough.</td>
<td>Customization</td>
</tr>
<tr>
<td>Trust</td>
<td>Show stability and goodwill to customers through increased possibilities for interaction and beneficial offerings.</td>
<td>Support</td>
</tr>
<tr>
<td>Understanding</td>
<td>Gather specific and practical knowledge about customers that can be used to make offers that come closer to guaranteed benefit.</td>
<td>Customization</td>
</tr>
</tbody>
</table>
7 STRATEGIC ANALYSIS

The previous chapter developed an understanding of each actor’s experience of the business relationship and was thus focused on its structure and process. In this chapter we will build on these experiences further and examine how the business relationship is managed and what the vision for this closer relationship is. This intends for a strategic simultaneous analysis of both actors’ attitudes and actions, representing present conditions, and thereafter desired relationship positions together with a developed scenario considering the concepts from the literature review representing future opportunities for the relationship. Moreover, these future opportunities consider our focus of an electricity retail company’s development of being an energy service provider.

7.1 The present business relationship conditions

It is obvious that both actors want a business relationship, but they have different opinions in their own visions about it. The visions primarily represent reaching a position that fulfills the actor’s own demands and not necessarily the partner’s complete vision. This could be problematic for the business relationship, if a compromise cannot be reached, but also for achieving customers’ acceptance of demand response and the products. As mentioned in the Literature review (Chapter 3), showing that you understand that the other actor has other interests, makes it easier for the other actor to accept what is offered. This means that the electricity retailer either should make customer adaptations to its vision or convince the customers that the company’s vision is better for the customers. In SCG, GEAB has made the customers accustomed to a certain degree of personal support, because it was needed to begin filling the knowledge gap the customers had. It is understood that, in the optimal case, companies’ desire to shift from intensive development project positions towards a position where less becomes more, and support becomes customization. In other words, a desired position where the company reaches a broader customer base with its new products and services in a cost effective matter. The present business relationship in SCG is reflected by general development project conditions, where it is expected to include resource and time intensive actions. It is thus a natural step to take that is almost inevitable. In SCG, these conditions seem to have had further influence on customers’ behavior as well as the behavior of the companies. It is therefore appropriate to conclude other characteristics in the current development project to determine the possibilities the companies in SCG have to further develop the relationship.

7.1.1 The early adopter is a naturally committed customer

The customers in SCG are signified as early adopters, as they do not require complete solutions, and thus expose themselves for greater risks. An early adopter, in this case, is then a customer who accepts new innovative products and services, while it is somewhat conscious of being a trendsetter. This comes from the ability the customers in SCG have had to evaluate the new solutions proposed by the project and suggest improvements, while keeping a good
relationship with the company even though parts of the project have not worked as intended, at some points. In general these customers seem to be less sensitive to variations in quality, as long as it does not impact their quality of living in the long run. According to our definition of trust, this means that these early adopters have a high trust in their electricity retail company due to that they are more accepting to variation that carries a certain degree of risk. This is, however, something that other customers see as unnecessary risk taking, which would mean that they have a lower degree of trust in their electricity retailer. All early adopters are, of course, not similar to each other. They have different interests and criteria connected to their routines and living standards. Specifically for SCG the customers have a high interest in either economy, environment or new technology, or a combination of the three. These factors have made the customers interested in participating in a development project like SCG.

There are no disadvantages to operate with early adopters, rather the opposite, due to their ability to influence other customer segments and thus other families and neighbors. The willingness to do this has also been seen in the survey answers. Apart from that, the early adopters’ involvement in SCG increases the companies’ knowledge of how these solutions should be adapted before they are commercialized on a market. This comes from the open attitude the customers have towards information exchange in the project, both to sharing information and to trying to understand what the project is educating them about. The reason to this could regard SCG’s objectives, which further reflect the interests of the participating customers.

It has also been concluded that the customers in SCG have a knowledge gap, even though they are classified as early adopters. This has been revealed in the survey where these customers showed little knowledge about if they had managed to reduce costs, among others causes, and has been verified by interviews of the staff in SCG. It is therefore appropriate to conclude that customers are susceptible, but cannot understand information enough to convert this into action or common knowledge. Probably, this depends on the complexity of what is offered. Information is still, though, important to exchange to these customers, as it reduces their level of uncertainty. This is something that also would be valid for many other customer segments. If information would not be exchanged, the customers might reduce their interest and commitment in the relationship, possibly because they lose trust in that the electricity retail company really wants what is best for the customers. Primarily, however, the downsides come from customers feeling that their expectations have not been met by the exchange. As explained by Bagozzi (1979) and Tikkanen & Alajoutsijärvi (2002) both satisfaction and future exchange depend on the fulfillment of expectations. In this case not exchanging any information, because it would be too complex for the customers, cannot be the solution since it would make customers dissatisfied with the company. Many customers have the need and take the initiative to interact with the support. In SCG this was especially true for the customers in the Auto group. The reason that it has been seen foremost among the Auto group probably is that these customers have more technical and complex solutions in their household, compared to the EW group. The customers possibly have the feeling that these systems are out of the customers’ control and thus they feel that they expose themselves for greater risks regarding their comfort. Therefore finding ways to provide these customers with appropriate information would be key to keep the customers in the relationship.
7.1.2 Reasonable incentive for possibilities to closer business relationships

Working with the early adopters in SCG means less resources and time spent in comparison with working with other customers that do not have the same interest in the company or do not have the same interest in what SCG proposes. This is because of their lower expectations, coming from the characteristics mentioned previously. The incentives these customers need would therefore probably be smaller than for other types of customers. This would have to be considered when discussing which incentives that could be used to get customers demand responsive. Compared to the studies of McKinsey & Company (2010), which focused on developing tools for getting customers into DSM programs, this study tries to combine such incentives and tools with the perspective of achieving a sustainable closer business relationship between the actors. It is therefore important to include if the company in a long-term perspective could manage to fulfill the expectations the incentives create. In Table 5 the early adopters’ and the respondents’ thoughts and behavior in the relationship are emphasized combined with Bagozzi’s (1975) exchange types. With this approach the companies’ possibilities to change or maintain customer behavior can be evaluated.

Due to the low electricity prices in Sweden, the economic incentive has not had the same effect as it could have if the price would have been more fluctuating, which could make the customers more active and interested in reducing their costs. Even though customers have not been facing significant cost reductions, customers have still been interested in developing their knowledge about the functioning of demand response and what they should do to reduce costs. This makes it possible for customers to influence their behavior and potentially save money, when prices begin to fluctuate more. The economic benefit is therefore still argued to have a top position among the incentives. But there is also another reason to this. The economic incentive is easier to evaluate than other incentives, making the comparison with the aforementioned expectations easier as well. If the customers were told that making effort into demand response would save them money, and they perceive that they have made an effort, they expect reduced costs. If the customers were told that at the moment the effort would render in a very small economic benefit, which will grow with the increase of fluctuating prices, the customers would expect that. This is very similar to a restricted exchange (Bagozzi, 1975), which needs transparent promises within the exchange to be evaluated.

If the economic incentive, however, imply a certain deterioration of comfort the customers seem to prioritize their comfort. Due to the fact that customers demand a maintained or improved comfort level and that this seemed to be crucial to keep customers satisfied, we can say that the customers expect that their comfort level will be kept intact. This is an expectation that does not depend as much on promises from the company. Still it is a factor that is easily evaluated by the customers. Even if the early adopters would accept some short-run deterioration, a change in the long run would be obvious for the customer who would find it probable that the company cannot fulfill this expectation. This would make comfort another top prioritized incentive. The relation between economy and comfort as incentives is however more difficult to decide, since a promise of large cost reductions could convince some customers to give up some of their comfort. See Table 5. Increased knowledge and personal relationships as incentives have some similarities to economy and comfort, since
customers easily could evaluate if SCG has provided an increased knowledge of for example how the heating systems in their homes work. However, the usefulness of the knowledge would be more difficult to determine compared to comfort, where the usefulness is a requirement for increased comfort, and economic benefit, which easily can be related to the financial situation of the customer. These incentives would therefore be prioritized lower in many cases.

Other underlying interests and thereby potential incentives, which have been found in the study, are indirectly affecting the behavior of the customers. The underlying interests that the customer have in the development of demand response regard the environment, new technology, and social goodness. The environmental interest, for example, can be used by the company by making promises that changing the behavior will assist further development of renewable energy sources. This is, however, difficult for the customers to evaluate in the relationship since it depends on other actors as well, i.e. generalized exchange (Bagozzi, 1975). It can, therefore, be concluded that these incentives, even though they have been mentioned earlier to be important, can be more or less associated with having a secondary effect on how customers act. Moreover, it could further be valid to assume that the other underlying incentives have a similar effect as the environmental, as the other incentives have somewhat similar difficulties in the evaluation of promises and expectations.

7.1.3 Making business of the development

Vattenfall and GEAB find that support costs too much and that customization can solve many of the problems that arise with the more complex smart products and services. It seems like this is the preferred method for these companies since many simple problems, such as difficulties with the installation, can be solved by adapting the product and the accompanied information to the knowledge and conditions for the selected household customers. These simple problems could be solved, at least partially, by the information gathered in SCG if a segment was selected. However, the more difficult problems, such as the adaptation of the control system to the specific conditions for the house and heating system of a customer, demand much more attention and knowledge gathering before the product could work without getting support-errands from the customers. It seems that the bigger problem often is that the product does not live up to the expectations (such as the incentives in Table 5) of the customers, even in a development project. The problem can be recognized in the customer’s wish to get more specific energy advises. Therefore it seems like the customization of these more complex and specific products and services is a large challenge that the companies have to focus more of their resources into, to be able to make it more effective than support.
Table 5 - Summary of the interests customers in SCG have is turned into incentives.

<table>
<thead>
<tr>
<th>Incentives</th>
<th>Exchange type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Restricted exchange</td>
<td>It is a central incentive where the attitude of reduced costs capture the absolute interest. The attitude towards money can vary between people, but can further be applied to many needs and wishes.</td>
</tr>
<tr>
<td>Comfort</td>
<td>Restricted exchange</td>
<td>If there are no drastic changes in the individual customer comfort, other incentives will get the focus. But if needed comfort will be prioritized over most other things.</td>
</tr>
<tr>
<td>Increased Knowledge</td>
<td>Restricted exchange</td>
<td>People will always seek further information and knowledge. But, it has shown that customers want specific information and knowledge adapted to their own conditions and interests.</td>
</tr>
<tr>
<td>Personal relationships</td>
<td>Restricted exchange</td>
<td>Customers want to feel secure and think that this can be provided by the company support. They want instant support that appears personal, instead of support by mail or telephone without the personal aspect.</td>
</tr>
<tr>
<td>Environment</td>
<td>Generalized exchange</td>
<td>It is a secondary effect that can be promised, but where the company only have a small part in fulfilling the promise. Regarding the environment the individual customer are interested or not interested in this promise.</td>
</tr>
<tr>
<td>Technical interest</td>
<td>Generalized exchange</td>
<td>Similarly to environmental interest the customers have interests in new smart energy innovative products and services. Thereby they want to be the first to try products that will revolutionize the market in the future.</td>
</tr>
<tr>
<td>Goodness</td>
<td>Generalized exchange</td>
<td>Some customers are positive in demand response since it is an interesting subject for the future. Moreover, these customers want to give the population, and their own children, the best possibilities to live in a future sustainable society.</td>
</tr>
</tbody>
</table>
7.2 Development of the business relationship management

The position of the relationship have to result in something both actors in the dyadic relationship could benefit from. The previously mentioned desired, or optimal, position could be one potential position for the relationship. Planning for reaching a specific position for the business relationship was, however, never an objective in SCG. The analysis of the possible positioning is instead based on the general comments the respondents had on the possibilities to develop the customer relationship for demand response, see Appendix 4 for SCG’s objectives. In the current position for the business relationship in SCG, the support have further been central and in some situations the respondents even declared that more could be offered to get an even higher satisfaction level from the customers. With this type of relationship it would be possible to come closer the customers since the work would basically be made on the terms of the customers. Even though this approach, as stated earlier, consider the company in an unbenefficial position, it is further a necessity to provide a feeling of security to their customers. In the current state of these types of complex products and services the only way to provide the security to the customer is through a high level of support. To be able to develop the relationship to the customers in a way that is appropriate for more complex offers, putting resources into this type of relationship probably will be necessary until external conditions and the knowledge of the customers catch up.

![Figure 11 - The positioning of the relationship in SCG in comparison with the position desired by electricity retailers.](image)

To understand specifically how Vattenfall and GEAB are trying to handle the relationship with the customers in SCG, this project have to be compared to general relationship between electricity retailers and household customers. Figure 11 shows the distance between the two positions described for the relationship. In SCG the relationship is characterized by the opposites of the characteristics in the position desired by Vattenfall and GEAB. Outside SCG the customer relationships seem to be close to non-existent which would mean a position in the bottom left corner of Figure 11. However, this position creates the question of if the
company shall try to approach other customers with a similar offer to what was offered in SCG, or if they shall offer less support to these in benefit for testing the customization.

The advantage for electricity retail companies, with a relationship position that includes a close relationship with high level of support, is the increased possibility to gather important information when having such a close relationship. The benefit from providing this support is, however, also that it shows commitment to the relationship. As explained in Chapter 3, showing commitment is the easiest way to get some commitment from the other party. Providing this support could be an opportunity to show the customers that both actors have some shared values, such as the incentives described in Section 7.1.2. This could be seen as some kind of social exchange, where the increase of social factors like trust, commitment and power balance is the objective. This means that, in addition to the customer specific information that is gathered from these personal exchanges, the exchange strengthens the relationship. In this perspective additional resources used for support could be valuable for the company.

The strategic elements in Table 4 (p. 55) summarize the actions an electricity retail company can take to develop situations where the relationship with the customers can be tested, to get the knowledge of how customers really behave and what they need. As seen in the strategic elements, getting a better understanding of the customers also lead to new possibilities to get more information. This is why the optimal position cannot be achieved in a near future, since the understanding that is necessary to reach this position has to come from a longer process of continuously improving the understanding. The electricity retail companies seem to only be in the beginning of this process. This is why the support is a very important matter for these companies, since it helps them to keep customers close during this process.

This process is also something that can help the companies to develop better market conditions for the products and services. One reason specific for demand response is that customers that have to put effort into understanding too much details of something that is this complex will value their comfort higher than any economic benefit. In the case-study of SCG customers seemed to have some problems with following the directions from the project. However, we do not really see the short timeframe as the problem in this case. The foundation to the problem with customers getting confused by too much information, is the customers’ low knowledge of their own heating systems together with their low knowledge of how the electricity market works. SCG provides knowledge to the customers about both parts because this was needed to get the customers to actively change their behavior in a demand response manner. Since the knowledge-gap seems to be a general characteristic for household customers a continuous process where the electricity retailers get to work closer with the customers would definitely make it easier for the retailers to get customers interested in what they have to offer. To fill the knowledge-gap that the customer have, it is necessary for the retailers to increase the amount of exchange situations with the customers. Therefore, it could require continuous operational exchanges between the two actors, which preferably is to be managed with less intensive exchanges of information.
7.3 Reaching the vision of a closer relationship

Whatever the objective or vision actually contains it seems that both electricity customers and the electricity retail companies want to deepen the business relationship. Therefore it becomes important to find the right ways to direct resources, to in the end improve the relationship. The vision the companies in SCG have, reducing costly support and improving the product quality through customization, need to be evaluated against the possibilities they have to develop the relationship. If this evaluation is not performed, the companies risk worsening the relationship and losing customers, only because the companies have not used their understanding of customers to completely understand the limitations in the relationship.

7.3.1 Problems to improve the relationship

There are efficiency problems with actions that are meant to improve the business relationship, which can consume the resources put into the relationship without improving the situation at all. Some of the relationship factors that were discussed in Chapter 3 are factors that, in the context of the relationship between the household customers and the electricity retail companies in SCG, seem to be difficult to improve. The power balance is something that you might think can be improved by giving the customers knowledge that they can use to decrease the electricity costs. This kind of openness from the electricity retail company, which reveals the structure of how the company earns money, have instead in some cases led to partial suspiciousness from customers. Other attempts, as the provision of optional control schemes that the customers could choose, have also only had some positive effect on the customers’ reviews and therefore it seems that the effort the companies are putting into this might be wasted. In a business relationship perspective at least. There are other external events and conditions, such as customers’ lack of trust and available time, which make effort made by the companies fade in comparison. Similarities with this can be found in the attempts from the project to increase customers’ commitment to this relationship, as well as their satisfaction with it and the acceptance of the products. To get committed customers, SCG has tried to provide incentives that speak to the customers’ interests and shown a will to make things better for the customers, i.e. the companies have shown commitment towards the customers. This has not resulted in a wide increase of customers’ commitment. The majority of the customers have not shown an obvious improved interest in adapting to the information, but instead seem to demand clearer incentives. The commitment is, similarly to the power balance, restricted by external conditions and events since it varies with the other short-term interests the customers have. For the satisfaction and the acceptance the customers have shown in the project it seems that these levels also vary with external events and earlier exchange events that the customers have with other companies and organizations. Therefore, the effort put into improving these relationship factors may not necessarily improve the relationship to the level a company wishes.
7.3.2 Possibilities to improve the relationship

If we instead discuss the impact resources have that are put into increasing customers' trust in the electricity retail company, it seems that trust is a relationship factor that have little to do with external events and conditions. The effort the staff in SCG have put into increasing the reliability of the installed solutions, accordingly to the feedback they have received from the customers, has been massive. Something that of course is natural for a customer-focused development project. It seems that this effort has been appreciated by the customers, who have a feeling that they actually are learning things from the involvement and there have also been very few long-term complaints and dropouts from SCG. The positive comments on the support and the willingness to recommend the project to others have also contributed to that we have experienced an increase in trust from the customers. They find that risking to sound stupid when asking questions and risking their reputation among their neighbors is acceptable since they understand that the company tries it best to make the customers satisfied, and often succeeds with it. This is very similar to how we chose to define trust in Chapter 3.

If we implement a scenario where the electricity retail company provides advisory services to the customers, a way to increase customers' trust in advises from the company could be to provide advises with more specific details. The reason to this is that it is easier for customers to question the quality of advises that are not connected to specific characteristics of the customers' households. If the advice instead is made with connection to the customer's specific heating system it would seem that the company has competence of what consequences and benefits that the specific customer could face, if following the advice. The reason to why customers demand more specific advises is therefore because of a lacking trust in that the company has this knowledge. Trust is therefore an extremely important characteristic for the electricity retail company to develop in the relationship.

Trust is also a factor that does not have to be proved if there are signs that the company is trustworthy, such as other customers recommending involvement with the company. However, high trust is a characteristic that have to be continuously cared for in a relationship since it may decrease quickly if the trust is abused. The company should therefore develop its exchange possibilities elaborately. For an electricity retail company offering a product that can help customers to improve their energy behavior, the quality of the product is easily linked to if the trust is maintained or decreased. However, guaranteeing full satisfaction from a product for every customer that buys it is not possible. If the product is complemented with possibilities for information exchange this can be managed as a safety net for the company to keep away from situations where a customer completely loses the trust in the company. In this sense there are three types of exchange that make it possible for these companies to keep up the trust in the relationship. The product exchange is obviously the primary exchange. The other two are information and social exchange. These two exchange types could be managed in different ways, with customer support as one example, but what is important to manage is the questions that the customers might have. In the perspective of normal support matters it would mean answering the questions through information exchange, or through social exchange managing the questions until they can be answered or solved. It is through developing the trust and exchange an electricity retail company could develop closer
relationships with its customers and it is also through these factors that the company can increase the possibilities to implement demand response in households in the future.

The packaging, of what is offered, has to include exchanges that are tangible and intangible and where the company has to be prepared to exchange complementary products and services even after the primary exchange has been performed. This indicates that the exchange, between the buyer and the seller, becomes complex and in some ways even restricted as proposed by Bagozzi (1975). It becomes complex as buyers have the ability to experience products and services differently and therefore they demand different amounts of exchange. Furthermore, the restricted exchange, where the company gives exactly the same amount of exchange to every customer that pays the same amount, is thus not possible with household customers. Instead it is suggested that the company has to consider providing exchange, including informational and social exchange, to different extents for different customers where this exchange is portioned out during the customers’ using of the product. If considering demand response as a result of closer business relationships, only the foundation regards the technical solutions. Beside the technical solutions, further services have to be initiated to increase the customers’ knowledge and understanding of smart energy solutions, to make the commercialization of these complex products possible. Due to this, the exchanges with customers, in the development of demand response solutions, will be very varied depending on the customer.
8 CONCLUSION

From the use of the business relationship perspective in the analysis of the work in Smart Customer Gotland there have been advantages that we might not have encountered without applying this perspective. With the use of this perspective we have got a possibility to understand the full development process that has characterized the relationship between the Swedish household customers and their electricity retail company, as well as the limitations in the relationship. There are underlying trends and problems that explain the behavior of the actors’ on the electricity retail market, which affect how demand response towards household customers can be approached. The following were found when investigating the actors in SCG.

8.1 The impact of the business relationship

The current trend towards an enforced position for household customers on the electricity market has led to possibilities for customers to dictate certain terms in their relationship with electricity retailers. Since the deregulation of the electricity market, many governmental reforms have had the purpose of improving the market to allow the electricity customers a better position. However, it seems that these reforms have not been demanded by the customers and that the retailers now struggle with making household customers interested in and satisfied with this closer relationship. The current relationship is characterized by the customers’ knowledge-gap regarding their own electricity consumption and how the electricity market works. In the perspective of the electricity retailers, this could be a possibility to earn easy money. The retailers in SCG have instead had a focus on increasing their customer specific knowledge to find sustainable ways to offer services that customers can benefit from. The possible future benefits for customers could be vast, but household customers are in general unwilling to pay for these kinds of services at the moment. There are some market characteristics that possibly can be used by electricity retail companies to create sustainable strategies for how to form a closer relationship with household customers:

<table>
<thead>
<tr>
<th>Market characteristics</th>
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<tbody>
<tr>
<td>Retailers are the single source of information for the electricity customers.</td>
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<tr>
<td>Very low benefits in opportunistic changing of electricity retailer.</td>
</tr>
<tr>
<td>Long-term relationships can create deeper customer specific knowledge.</td>
</tr>
<tr>
<td>Customers have high basic trust in the electricity companies in general.</td>
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</table>

The solution to having such a relationship on this market is, therefore, for electricity retailers to somewhat take advantage of the fact that customers are depending on the electricity retailer when it comes to getting support and information regarding the electricity market, and turn this into regular exchange events. As long as the trust from the customers is kept high, a developing approach with testing new products and services on customers will be allowed. This approach would also prove successful for the electricity retailers to, enabling them to gather specific information that is needed for the continued development of smart energy products and services in general, and for demand response specifically.
8.2 Research implications

For both actors to perceive that there is a business relationship, three different key exchanges, represented by Product Exchange, Informational Exchange and Social Exchange, have to be included. These have to be included since they consider both tangible and intangible exchange, which are required for the actors to get the additional value that characterizes a business relationship.

The Product Exchange is the essence of the offering, consisting of energy products and energy services, by the company. It is what all the customers will encounter, independent on how the exchange is performed. The product exchange is what the customers are most interested in from the offer and since exchanges of tangibles are easier for customers to evaluate, the product exchange is the most tangible part of the three exchange types. If this would be excluded there will be no business relationship at all. The most important element during this exchange regards the company’s ability to incorporate professionalism, which means that the quality of the product should fulfill the general expectations the customers have. Since it is fundamental in the packaging of the offer, it thereby lays the foundation of the business relationship concept.

To decrease the complexity of the offering, and make it more understandable, the Information Exchange would be of priority to include. It requires the company to in a simple way balance the frequency of the exchange, to fulfill the demands from the customers as well as the restriction of resources in the company. Furthermore, the exchange can be achieved by the use of both tangible and intangible exchanges. Therefore, information exchange does not necessarily always include intensive personal customer dialogues. It could also be achieved by the simple information included within a product manual. In this matter, the informational exchange can have similarities with the social exchange, due to that they could be performed in conjunction with each other, but if the personal information exchange is minimized the social exchange has to be exchanged alone.

To reach out and come closer to the customers the Social Exchange has to be included in addition to the two latter exchanges. This particular exchange considers the company’s ability to in a higher degree customize the customer dialogue and actions taken in the process of closer relationships. This can be used to create a bond between the actors. The social exchange is not necessarily visible through its own exchange events, in the same way as the two latter exchanges, but it is neither strictly connected to a specific exchange type. It is rather independent, which means that it could appear whenever there is some exchange event, and foremost appears as intangible. Social exchange can be described as the foundation to get the first actor to understand the other actor’s reasons to be involved in this relationship, where trust is one of the objectives with the social exchange.

8.2.1 The connection between product, informational and social exchange

The trusted exchange relationship, which would be appropriate on the electricity retail market, has its foundation in the availability of information for customers. A business relationship, between these two actors in their situation, is according to our definition only
existing when the three exchanges are managed by the company. To maintain this business relationship, trust is the decisive concept. More specifically, it is decisive since the relationship is the primary source of information for the customers. Furthermore, the three exchanges are each contributing to maintaining trust in different ways since the concept depends on social factors as well as the outcomes of the exchanges.

In Figure 12 the three ways of maintaining trust towards the customer, such as for the early adopters, are presented as a model describing the three exchanges as relationship safety nets. The first instance the electricity customers face are the products and services provided by the electricity retail company, a so called product-for-money exchange. If the expectations from the customers and promises made by the company are fulfilled by the products and services, the trust the customers have in the company will increase or at least be kept at the same level. When something with the products or services fails, such as a product that is too complex to use or when there is a power outage, the second instance customers want to turn to is a source of information. In this case customers has the need to understand what is going on and what they specifically should do. There are many ways, with different costs, to provide this information to customers that are appropriate for different situations. The cheapest way, like online one-way information is not necessarily the best or the worst option at all times and the chosen way of information exchange has to be supplemented by an appropriate level of social exchange, which is the last safety net for electricity retailers. The social exchange is the last instance that can intercept customers from completely losing the trust they have in the company. In this case the social exchange could be support by telephone that keeps the customer updated on the problem solving process or how long time the customer can expect that the problems will continue. Since high trust is a characteristic that quickly can be lost in a business relationship it is important to have complementary safety nets, especially since keeping customers is cheaper than finding new. To completely rely on the product exchange is not an option and therefore has to be supplemented with the provision of information through information exchange and social exchange.

![Diagram of trust exchange relationship model]

*Figure 12 - The safety nets for our developed trusted exchange relationship model.*
The other relationship factors presented in the literature study (acceptance, commitment, power and satisfaction) all have effect on customers’ behavior but seem to be more influenced by specific customer characteristics, such as age and interests, and by external events, such as media and other companies. They are therefore also less possible for a company to affect. Trust is instead to a higher degree determined by the specific experience the customer have had with the specific company, or in some cases with the specific industry, which in turn is determined by the exchange between the electricity retail company and the customer.

From the focus of this thesis, we have been able to determine trust as the most important concept to work with because of the specific conditions that exist in the focal relationship. The purpose of the model is therefore that it shall be used in the development of the customer approach on the electricity retail market. However, the opportunities to use the model of trusted exchange for developing a closer business relationship are not specifically delimited to the implementation of demand response and the products and services used to achieve demand response, even if that has been the focus of this thesis. It is neither delimited to manage customer relationships in the situation where developments occur. The use of the model can be specified in more general terms.

### 8.2.2 Using the trusted exchange relationship in general

Business relationships with customers are vital for achieving the acceptance and trust that is needed for the customers to continuously use the product or service. A business relationship is therefore needed in the case of demand response, since the products that potentially could make demand response possible require some continued interest and use. However, since the customers might be too comfortable and unwilling to change, a business relationship approach can be used to convince the customers to trust that the use of the product will benefit them in a satisfactory way. This means that the business relationship can be used to provide both selling arguments and arguments for continued use. However, to achieve a business relationship, some sort of personal interaction is needed to be able to communicate what connects the two actors on a higher level, for example shared values. This is what makes the social exchange so important for customers’ use of complex products. This is what the trusted exchange model is meant to show. In our definition, a complex product or service is something that customers feel that they cannot use in an effective way, without getting further information about how it functions and how they should use it. The customers could use the product without getting further information, but the use of the product would not be satisfactory for them. In our specific case the complex product has also meant that the company wants the customers to use the product continuously. This definition of a complex product is also what restricts the use of our model.

The background to the development of the model is the discussion regarding the packaging of the offering that surrounds the complex product or service. In this discussion the different ways to exchange information have been central. From the study it appears that companies feel that the returned exchange, from their events for information and social exchange, is not as valuable as their own effort. This is why they seek for possibilities to simplify and generalize these exchanges, to get the exchange as close to the definition of restricted exchange as possible. However, what we see as more important is that all exchanges
surrounding the main product or service shall be treated together, to in the end achieve the restricted exchange situation from the separate events of complex exchange. Bagozzi’s (1975) complex exchange should, however, not be mixed with our definition of a complex product. In this way the information exchange and social exchange also should be seen as incentives for the customers to get involved in the relationship with the company.

In this study it was initiated by including the personal relationship and increased knowledge in Table 5 (p. 61) with other incentives that are important for customers, such as economy and comfort. We also concluded that the incentives that should be prioritized by the companies are the ones that the customers easily can evaluate. This is why these exchanges should be seen as important together with the product exchange. They are incentives for the customers to get involved in a business relationship.

8.3 Managerial implications

It is not problematic for the electricity retailers, especially in a demand response context, that the commitment from customers generally is low. Instead, the companies can utilize this together with a high level of trust to implement more automatically functioning products that address increased comfort for customers rather than more commitment. This means that attempts of marketing that have the objective to increase the commitment and interest of customers, such as advertisements and commercials, are wasted money for an electricity retail company. The short-term benefits between different electricity retailers are close to nonexistent and customers that figure this out will stop seeking for these opportunities. This fact can be used by electricity retail companies when planning marketing events and instead put their resources into building another type of competitive advantage. High customer trust is a factor that is difficult to market to new customers since it primarily has to be built by exchange. Instead the money primarily should be spent on the customers the company already have and rely more on the effects of word-of-mouth. If complemented with exchange opportunities through products and services that are reliable and more customer specific and have a world-class information-based safety net (see the two levels of more intangible exchange in Figure 12) the money will generate in a sustainable competitive advantage.

8.3.1 Developing demand response and other energy services

In the development of cost efficient offers including the three safety nets for trust, it seems that for the electricity retailers much focus have to be put on making the support efficient. The reason for this is that many customers become confused by the complex products that are needed to fulfill their specific demands. Ideas like testing to handle customers via online customer communities would, therefore, be interesting since this could get customers to help each other to some degree. However, in the further development of demand response and other energy services there are two essential contents that companies on the electricity market should consider.
Firstly, the electricity retailers have to recognize that customers do not understand why they should make any changes to their way of current living. With Vattenfall and GEAB trying to develop possibilities for demand response in this way, one can say that they are pioneers in the development of smart energy efficient business models that suggest for a closer business relationship with customers. To make demand response interesting and appealing for customers is difficult because of the current electricity price and calmness on the market. The market has stable electricity supply and has little need for radical changes. However, continuing with educating customers, as well as trying to simplify advises and support for them, can make it possible for the companies to deliver the customer specific services and adapt them based on the customers’ demand. Simplifications, incentives and knowledge seem to be linked on this market. The customers on the market are unsure of what they shall do; this comes from the fact that the customers do not fully understand why they shall do these changes that the electricity retailers suggest, and how this will affect their lives. But a general development of trust can also be used in this situation. The trust the customers have in the electricity retail company is somewhat depending on the situation on the market. The customers can afford, both financially and in terms of conscience, to question the intentions of the electricity retail company and if the company really understands the specific situation of that individual customer. Showing their competence did work for Vattenfall and GEAB in SCG. To make customers trust the companies, the companies have to come closer to and spend more resources on their current customer relationships. This is the foundation to be able to implement some sort of customer involvement in the balancing process of the electricity system.

Secondly, the solutions that in the end will be used by household customers do not necessarily have to be sold directly to the customers by the electricity retailers. Future cooperation with suppliers of the electric heating systems is needed to be able to automatically control the heating systems of a larger share of household customers. The first reason to why cooperation with these suppliers would be interesting, is that to get the complete understanding of how this type of controlling heating impacts the specific house needs, much further knowledge and research is needed. Together with the suppliers of the heating systems the development and adjustments of the controlling system can be made with combined resources, and through a direct access to the knowledge of how these systems deteriorate over time and what types of systems the controlling can be used for. Applying this control directly into the heating systems also bypasses the need of commitment from the household customers. However, this instead demands that the electricity retail company can make these suppliers committed and find a common ground with them. This is actually also a second reason to why they have to cooperate. In the encounters in SCG between these actors it seems that there might be differences in what the actors think is best for the customers. If the actors have different views of how the heating systems should work there is a risk that the electricity retail company loses some of the trust customers have in them, since the actor who sells the system probably is the one the customers trusts the most. Therefore, it would be critical for the continued development of heating system control that these companies can have a relationship that complements the trust-based exchange relationship the electricity retailers need towards the household customers.
8.4 Further research

Future research could analyze other customer segments, not necessarily the early adopters, with a similar perspective as this thesis. Thereby our research could be further validated including how trust is developed and how the exchange events should be planned in future business relationships, see Figure 12. One guess would be that other customer segments would need more social and informational exchange in the relationship with the electricity retail company compared with the early adopters, but these have to be further studied.

To support the specific development of demand response, another perspective for future research could also be to find possible synergies in cross-industry partnerships regarding consumption control for the purpose of demand response, and how this can be used to develop joint customer relationships.
REFERENCES


APPENDIX 1 – INTERVIEW GUIDE FOR INTERNAL INTERVIEW

BEFORE THE INTERVIEW STARTS

DO YOU WANT TO BE ANONYMOUS IN THE PROCESSING AND PRESENTATION OF THE INTERVIEW RESULTS?

DO YOU WANT TO GET THE OPPORTUNITY TO CONTROL A TRANSCRIPTION OF THIS INTERVIEW?

DO YOU APPROVE THAT THE INTERVIEW IS RECORDED AND STORED WITHIN THE TIME FRAME OF THIS THESIS STUDY?

THE BACKGROUND AND KNOWLEDGE OF THE INTERVIEWEE

Q1: WHAT IS YOUR PRIMARY AREA OF EXPERTISE?

Q2: WHICH ROLE HAVE YOU PLAYED IN SMART CUSTOMER GOTLAND?

Q3: WHAT DO YOU THINK CHARACTERIZES THE RELATIONSHIP BETWEEN THE ELECTRICITY RETAIL COMPANY AND THE ELECTRICITY CUSTOMER ON THE SWEDISH ELECTRICITY MARKET TODAY?

PLANNING OF ACTIVITIES IN THE PROJECT

Q4: WHICH EVENTS AND TASKS CONNECTED TO SMART CUSTOMER GOTLAND HAS INCREASED YOUR KNOWLEDGE AND UNDERSTANDING OF THE BEHAVIOR OF THE CUSTOMERS?

Q5: WHAT IS THE MOST IMPORTANT WORK CARRIED OUT IN THE PROJECT THAT ENSURES THAT CUSTOMERS DO WHAT THE PROJECT WANT TO ACHIEVE?

Q6: WHAT IS THE PRIMARY REASON THAT THE PROJECT DOES NOT INCLUDE MORE CUSTOMERS?
**Q7:** WHICH RISKS ACCOMPANIES AN INTENSIVE COOPERATION WITH CUSTOMERS AT THE ELECTRICITY MARKET, WHEN THE COOPERATION IS CARRIED OUT AS IN SMART CUSTOMER GOTLAND?

**BARRIERS THAT HAVE TAKEN PLACE DURING ACTIVITIES DURING THE PROJECT**

**Q8:** WHAT DIFFICULTIES HAVE BEEN PROMINENT, BUT ALSO IMPORTANT FOR THE COMPANY TO MANAGE, WHEN CREATING A CLOSER RELATIONSHIP TO THE CUSTOMERS IN SMART CUSTOMER GOTLAND?

**Q9:** HAVE EXTERNAL ACTORS (SUCH AS GOVERNMENTAL AGENCIES, INDUSTRY ORGANIZATIONS, OR COMPANIES FROM OTHER MARKETS), EXCLUDING ONLY VATTENFALL AB AND GEAB, HAD ANY EFFECT ON THE WORK IN SMART CUSTOMER GOTLAND?

**Q10:** IN WHAT WAY HAS THE PROJECT CONSIDERED THE EFFECT EXTERNAL ACTORS, IN THE ENVIRONMENT OF THE CUSTOMERS, HAVE ON THE BEHAVIOR OF THE CUSTOMERS?

**EXPERIENCE AND LESSONS LEARNED FROM ACTIVITIES IN THE PROJECT**

**Q11:** HAVE YOUR VIEW ON CUSTOMERS CHANGED IN SOME WAY DURING THE PROJECT, AND HOW DID IT CHANGE?

**Q12:** WHAT SPECIFIC INVESTMENTS OR SERVICES WOULD NOT BE ECONOMICALLY VIABLE OR POSSIBLE TO MAKE IN AN ACTUAL MARKET SITUATION?

**Q13:** WHAT HAVE YOU LEARNED FROM THE PROJECT THAT THE COMPANY WOULD HAVE TO INCREASE ITS KNOWLEDGE ABOUT REGARDING CUSTOMER RELATIONSHIPS FOR DEMAND RESPONSE, WHICH THE PROJECT CAN’T ACHIEVE?

**Q14:** HOW DO YOU THINK THAT THE INVOLVEMENT OF THE CUSTOMERS IN SMART CUSTOMER GOTLAND HAVE AFFECTED THE RELATIONSHIP BETWEEN VATTENFALL AB, GEAB AND THE CUSTOMERS?

**Q15:** HOW MANY YEARS WILL IT TAKE BEFORE THIS TYPE OF RELATIONSHIP AND CONTRACTS BETWEEN ELECTRICITY CUSTOMER AND ELECTRICITY RETAIL COMPANY CAN APPROACH THE MARKET?
Q16: WHICH IMPORTANT CHARACTERISTIC FEATURES SHOULD EXIST IN THE RELATIONSHIP BETWEEN THE ELECTRICITY RETAIL COMPANY AND THE ELECTRICITY CUSTOMERS TO MAKE SMART GRIDS ACHIEVE ITS FULL POTENTIAL?
APPENDIX 2 – THE SURVEY QUESTIONS FOR HOUSEHOLD CUSTOMERS

Below each question the possible response options are summarized between brackets [ ].

Q1 - Think of your experience of the project Smart Customer Gotland so far. How satisfied are you with this experience, and please motivate why?

- [1 (Very dissatisfied) ... 10 (Very satisfied)]

Q2 – How satisfied have you been with the support from GEAB for this project, if you have been in need of any support, and please motivate why?

- [1 (Very dissatisfied) ... 10 (Very satisfied)]

Q3 – Have you experienced that your involvement in the project has resulted in decreased comfort?

- [Yes, definitely; Yes, to some degree; No, not at all]

Q4a (for Auto) – To what degree have you changed your general energy behavior after the installation and start of the project? We want your opinion on the changes of your awareness about energy efficiency in large and not only you manual changes in the control scheme.

- [1 (To a very low degree) ... 10 (To a very high degree)]

Q4b (for EW) – To what degree have you changed your general energy behavior after receiving the equipment and the start of the project? We want your opinion on the changes of your awareness about energy efficiency in large?

- [1 (To a very low degree) ... 10 (To a very high degree)]

Q5 – Have the energy costs of the household changed in any way since the start of the project?

- [1 (Decreased significantly) ... 5 (Increased significantly); 6 (No opinion)]

Q6 – What are your expectations on the project Smart Customer Gotland from now?

- [Comment]

Q7 – How probable is it that you would recommend a friend or a colleague to participate as a test pilot in Smart Customer Gotland?

- [1 (Very unlikely) ... 10 (Very likely)]
The following questions were only directed towards the customers with automatic systems installed, hence the question number ends with (a).

Q8a (for Auto) – Have you during the project changed to another control scheme type? If yes, what is your control scheme now?

- [Yes; No, No opinion]

Q9a (for Auto) – How large is your trust in the automatic control of your heating systems?

- [1 (Very little trust) ... 10 (Very much trust)]

Q10a (for Auto) – Have you made changes to the control scheme through the app? If yes, what of the following statements suits your general changes?

- [I have sporadically manually made changes to the control scheme; I have continuously manually made changes to the control scheme]
### APPENDIX 3 – INTERVIEW RESPONDENTS

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<thead>
<tr>
<th>Respondent</th>
<th>Role in SCG</th>
<th>Knowledge area/experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christina Svalstedt</td>
<td>Vattenfall Project leader</td>
<td>Vast experience in customer behavior and customer management regarding all types of customers between very large electricity consumers and household customers.</td>
</tr>
<tr>
<td>Johan Sjöndin</td>
<td>GEAB Customer contact and overall lead support</td>
<td>Development of business customer sales and marketing of energy products and services.</td>
</tr>
<tr>
<td>Jörgen Eriksson</td>
<td>Vattenfall Customer recruitment, support and advisory services</td>
<td>Energy efficiency expert towards household customers with long experience of customer interaction.</td>
</tr>
<tr>
<td>Magnus Eriksson</td>
<td>Vattenfall Market installation technology requirements</td>
<td>Supportive information technology without close interaction with household customers.</td>
</tr>
<tr>
<td>Per-Olof Nylén</td>
<td>Vattenfall Advisor of price and market strategies</td>
<td>Development of new services based on market analysis with partial focus on household customers through surveys and focus groups.</td>
</tr>
<tr>
<td>Ulf Öberg</td>
<td>Consultant Lead analyst</td>
<td>Project management and analysis management from several development projects at Vattenfall.</td>
</tr>
<tr>
<td>Bosse Andersson</td>
<td>Svensk Energi No role in SCG, only external information</td>
<td>Vast knowledge about trends on energy markets and vast experience from working with development on the electricity market.</td>
</tr>
<tr>
<td>Catherine Lillo</td>
<td>Svensk Energi No role in SCG, only external information</td>
<td>Deep knowledge about end-customers’ energy use and the market develop towards these customers.</td>
</tr>
</tbody>
</table>

Five of the interview respondents that works or did work in SCG were employed by Vattenfall AB, while one was employed by GEAB and the last was a hired consultant employed by the project. Two have had prior experience with pilot projects towards household customers, but none of the others. Four of the respondents have not had any direct contact and interaction with the customers in SCG but instead have got an understanding of these customers through project data, customer e-mails, project surveys or project meetings. For all the persons interviewed from the project, except the project leader, the experience from SCG has meant an increased interaction with customers through those mediums.
APPENDIX 4 - CASE PROFILE

Vattenfall AB and Gotlands Energi AB

Gotlands Energi AB is a subsidiary to Vattenfall AB, an international electricity company with the Swedish government as owner. The organization of the work provides a comprehensive picture of the possibilities and challenges the focal companies in Smart Customer Gotland faces on the energy market. This can be used to understand the choices made in the project and why this market test is important for the continued work at Vattenfall and GEAB.

As a governmentally controlled organization and as the leader of the three competitive parts of the Swedish electricity market Vattenfall obviously has an interest in investigating different possible scenarios for the market and if they should or could adapt to them. But as governmentally owned and controlled organization, Vattenfall also has some characteristics that other competitors on the market does not have, for example being governmentally owned and controlled. This could indicate specific conditions for the generalization of the results of this case study. However, the strategic objectives of Vattenfall are close to the ones of a private company and the electricity market is at the same time generally controlled by legislation and governmental control. Vattenfall, as most companies on the electricity market, also has broad relationships with actors surrounding the market, for example the Swedish Energy Agency (SEA), the Swedish Energy Markets Inspectorate (SEMI) and trade organizations such as Svensk Energi, which with different perspectives try to affect the work at the electricity retail companies, including Vattenfall.

GEAB is Vattenfall’s attempt to have local presence on Gotland. GEAB have a vast majority of their electricity customers living on Gotland and has the complete responsibility of the electricity grid (GEAB, 2015), which make their presence and local approach for the customers unique.

Smart Customer Gotland

Vattenfall and GEAB are involved in a development project for Smart Grids called Smart Grid Gotland (SGG). The project is developed on the island due to its specific condition of large share of RES together with limited transmission and energy storage possibilities (Svalstedt & Löf, 2014). In the project a market test called Smart Customer Gotland (SCG) is also included. This sub-project’s main objective is, however, not developing new technology, but instead to use existing technology as a mean to achieve an improved understanding of the consumption behavior of the customers. In the project the primary electricity retail company, GEAB, provide the customers with price incentives and information to see if this can affect the customers’ own electricity consumption (Svalstedt & Löf). The primary objective of the project is to make customers move consumption from hours where the price is high to cheaper hours, i.e. demand response.

The household customers belonging to the auto group

The project has given about 230 customers the opportunity to install automated systems, in the homes of the test families involved. These systems will help the test families to actively
reduce their electricity cost. The automated systems control the electricity heating systems installed at the household customer and follows existing control schemes, i.e. electricity consumption control. This is the main event and comprises SCG. The project is unique with demand response tested on a market with real effect on customers’ electricity bills.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automatic demand response</strong></td>
<td>Control system that automatically decreases consumption when prices are high. The scheme for the control system is decided and distributed to the customer through the App after the spot prices at Nordpool for the next day are determined.</td>
</tr>
<tr>
<td><strong>Multiple control schemes</strong></td>
<td>The automatic control systems follow a weather and temperature dependent schedule that adapts the heating for the price at every hour. The customer can in the App choose between different control scheme types to either increase comfort or reduce costs.</td>
</tr>
<tr>
<td><strong>Override possibility</strong></td>
<td>The customer can make manual changes to the chosen control scheme in the App to either make the heating run or shut it off at the chosen hour which also affects the consumption.</td>
</tr>
<tr>
<td><strong>Visualization of consumption</strong></td>
<td>The App is the primary tool for visualization of the consumption patterns for the customer as well as the primary tool for all simple messages that inform customers of events in SCG.</td>
</tr>
<tr>
<td><strong>Enhanced spot price</strong></td>
<td>The spot price from Nordpool has been improved by an amplification of the variations, peaks have been increased and the lower prices decreased even more. This simulates a situation where the risks for shortage and oversupply of electricity are high.</td>
</tr>
<tr>
<td><strong>Time tariff</strong></td>
<td>The most flexible type of grid tariff is added to the enhanced spot price where the price during the day time (06-22) and winter season is clearly increased since demand often is higher then.</td>
</tr>
<tr>
<td><strong>Wind bonus</strong></td>
<td>If the wind power production have been high for many days customers get a rebate on the electricity price to simulate extra incentives that the customers can respond to, but with shorter notice and provided through a message in the App.</td>
</tr>
</tbody>
</table>

The household customers belonging to the EW group

A total of about 50 customers that could not get the automated system, were included in the project. Instead they were given an updated version of Vattenfalls visualization system EnergyWatch. These customers are sometimes referred to as EW customers or the EW group.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EW visualization system</strong></td>
<td>Real-time system that shows the total consumption in the household but also the spot price at the time to make customers aware of how their consumption pattern compared to the price curve. Includes an App connected to keep the customer updated.</td>
</tr>
<tr>
<td><strong>Spot price</strong></td>
<td>The main feature for the price that varies by the hour is the spot price determined at the electricity trading market Nordpool.</td>
</tr>
<tr>
<td><strong>Single tariff</strong></td>
<td>A flat grid tariff for all hours and seasons that is added to the price.</td>
</tr>
</tbody>
</table>