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Business Strategy Development A case study in the hydropower market

*Master of Science Thesis
in the Management and Economics of Innovation Programme*

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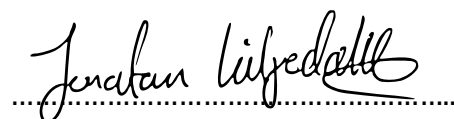
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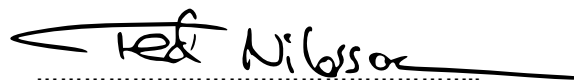
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Gothenburg, 31st January 2013

A handwritten signature in black ink, reading "Jonatan Liljedahl", written over a horizontal dotted line.

Jonatan Liljedahl

A handwritten signature in black ink, reading "Ted Nilsson", written over a horizontal dotted line.

Ted Nilsson

Abstract

The Swedish market for technology consultancy services within hydropower is mature and stable. Today it exist 1800 power plants where 200 is considered as large-scale. Most of the plants were built in the 1940 to 1950 and today no new plants on new sites are built today due to governmental legislation. ÅF Hydropower (ÅFHP) is a department within ÅF which focus its offering to the hydropower market. ÅFHP has a goal to expand from todays 50 to 120 consultants within a three-year period. The purpose of this thesis has been to identify growth factors in the market as well as internal resources and capabilities at ÅFHP and identify possible gaps between them. Based on these gaps recommendations are given in how to minimise or close these and by that achieve growth.

The thesis has used semi-structured interviews with actors in the industry and external data as reports and earlier research for the market investigation to be able to understand the challenges of ÅFHP's customers and how they evaluate consultants. At ÅFHP semi-structured interviews were performed with managers and senior consultants as well as a questionnaire that was sent out to all employees within the market area of hydropower. Internal data was also used to identify and understand the resources and capabilities ÅFHP possessed.

Five growth factors were identified and after the analysis three of them were considered attractive from ÅFHP's perspective; Small-scale hydropower, Change in legislation and Risk minimisation. Three competencies, in terms of knowledge resources, were ÅFHP considered to have competitive advantage in. The thesis also identified three capabilities where two were identified offered competitive advantage. By matching the growth factors with ÅFHP's resources and capabilities gaps were identified within the area of standardisation, references, market intelligence, senior competencies and targeting of customers.

The conclusion of this thesis was that it do exist growth factors within the market. It is also concluded which resources and capabilities ÅFHP possess today and gaps between the market need and ÅFHP's offering. This thesis recommends ÅFHP to work with minimising the identified gaps within respectively growth factors and by that achieve a potential to organisational growth. The recommendation for the growth factor, Small-scale hydropower, is to provide cost-rational solutions and services specific for the small scale-customer. Within Change in legislation is the recommendation to increase ÅFHP's knowledge of the consequences for customers and plant owners are facing and to increase focus in projections that may give rise to additional sales. The recommendation for Risk minimisation is to decrease different risk aspects perceived by the customer. Work with standardisation of processes, references, recognition and as well as the capability "One-ÅF".

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1. Introduction

In this initial chapter of the thesis the purpose of and research question to the thesis are presented as well as motivated by the background. The limitation of the thesis and how confidentiality has been handled are also described.

1.1 Background

The Swedish electricity production is dominated by nuclear power, hydropower and combined heat and power. Hydropower is a large source of electricity in Sweden, 2011 it produced 66 TWh out of the total 146,9 TWh. (Svensk Energi, 2012). Since the electricity production is depending on hydropower the price of electricity can fluctuate with the factors affecting hydropower, such as precipitation. However, for some of the plants, future energy demand can be stored in water dams and be released when energy is needed the most e.g. during the winter period.

The infrastructure of hydropower plants in Sweden consists of nearly 1800 power plants and the total installed power is 16200 MW. Out of these 1800 plants, 200 are counted as large scale with an installed power above 10 MW (Jönsson, 2011). Most of the power plants were built 1940 to 1950 and today only a very few new are built, since the most preferable locations have been exploited and the unexploited rivers are protected by law in new-development of power plants. However, there is a growing market for maintenance and upgrading of the aging hydropower plants, environmental concerns and demand for increasing economic return. The growing maintenance and upgrading market in Sweden is estimated to 2.5 billion SEK yearly in the coming ten-year period. (Elforsk, 2010) This will offer an opportunity for support and planning of these power plants, since there will be large investment projects and an increase of specialist competence will be demanded.

ÅF, previously known as Ångpanneföreningen, is one of the largest energy and environmental technical consultant firm, with 6800 employees. Today it has a minor division in hydropower with 50 employees in Sweden. ÅF Hydropower (ÅFHP) has set a strategic goal to grow to 120 employees in a three-year period. To reach this goal, a strategic plan has to be developed and to understand how this growth can take place it is necessary to compare the market needs within the hydropower market with ÅFHP's present state.

Grant (2010) defines strategy as a link between the firm and its environment. To be able to formulate a strategy it is necessary to understand both the internal and external environment and a lack in consistency with either of them have lead to many companies failure. Grant (2010) further suggests that to investigate the internal environment the resources and capabilities within the firm should be analysed. According to Kohli & Jaworski (1990) it is important to have a market-oriented view to the external environment where the focus is to understand customers' need. Kohli & Jaworski (1990) further states that this understanding is not only regarding existing needs. New

customer needs identified by trends and driving forces are as important. By meeting customers need in a better way potential to achieve growth in market are reached and by exploiting these growth factors strategically goals can be met.

1.2 Purpose

The purpose of this thesis is to outline a growth strategy for a firm acting in technology consultancy services within hydropower, (ÅFHP), in Sweden. This will be done by identifying growth factors within the market and map them against the firm's resources and capabilities today to identify gaps. The thesis will outline recommendations to how ÅFHP can minimise gaps identified and by that achieve potential to organisational growth.

1.3 Research questions

To fulfil the purpose of the study following research question was formulated:

Given that growth factors exists, how can ÅFHP exploit these to reach their strategic goal?

To ensure a proper research structure and answer to this question following sub-questions were formulated:

- *Which growth factors will be important within the hydropower market?*
 - *If existing, which new customer needs can be found within the market?*
 - *If existing, which existing customer needs can be found within the market?*
- *Which resources and capabilities does ÅFHP possess today?*

1.4 Delimitations

This thesis deals with the market for technical consultancy services. It will only cover the market within hydropower in Sweden. The investigation is delimited to market area hydropower at ÅF. The thesis will outline recommendations to fill potential gaps that appear but it will not implement any strategies.

1.5 Confidentiality

Due to collection of sensitive information some of the information as well as sources have been regarded as confidential. The supervisor at ÅFHP has reviewed the thesis to ensure anonymisation of sensitive information. Sections in the thesis that have been considered to contain sensitive information have been removed or rewritten. The anonymisation is only regarding company information, details of competences and skills and has not affected the analysis or the result of the thesis.

1.6 Disposition

The disposition of this report is described in figure 1.

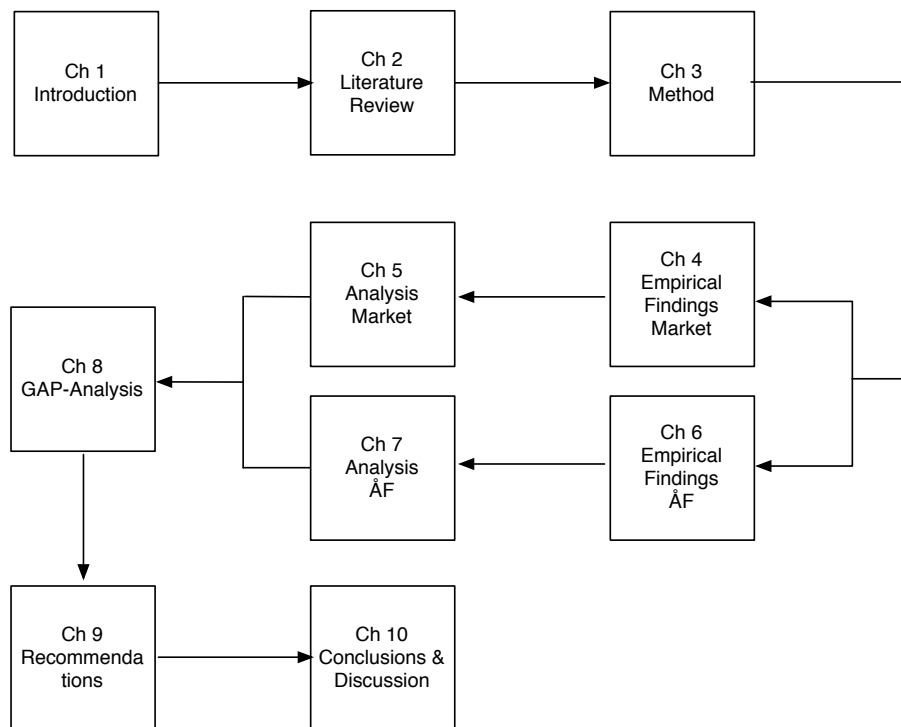


Figure 1 - Disposition of report

Chapter 1 – Introduction: The report starts with an introduction that gives a general overview of the firm as well as the problem investigated. Further, the purpose and research question is presented as well as how the scope of the thesis is defined and confidentially treated.

Chapter 2 – Literature Review: The literature review chapter starts with a description of the general research framework followed with a more extensive review of the market analysis. This section goes through relevant theoretical perspective of external and internal analysis, which generate the frameworks for analysis. The chapter continues with the framework for analysis of ÅFHP and ends with a description of the analysis where market and ÅFHP is combined.

Chapter 3 – Method: In the method chapter the research process is described together with research strategy. The different research methods and how they have been used are described together with a description of the sampling. The methods chapter finish off with description of how the data have been analysed together with a discussion of the research quality.

Chapter 4 – Empirical Findings Market: The chapter begins with a general description of the electricity market followed by a more in-depth description of the hydropower market. Following are key factors affecting the hydropower industry. After this section the consultancy services within the hydropower industry are presented with the buying

criteria the customer has as well as description of how the purchase of the services are made.

Chapter 5 – Analysis Market: The market analysis chapter go through three new needs and one new need found in the empirical findings. The new and existing needs are analysed according to the theoretical frameworks regarding new and existing needs, both presented in chapter 3.

Chapter 6 – Empirical Findings ÅFHP: The chapter presents empirical findings from ÅFHP. It begins with a description of service offering and organisation. Following are different resources presented and mapped according to how strong they are. After this the organisational practise are identified and presented.

Chapter 7 – Analysis ÅFHP: The analysis of ÅFHP is divided into resources and capabilities. Firstly the resources are analysed according to the framework presented followed by a similar analysis of the capabilities. The capabilities are grouped into three different head-capabilities. The chapter ends with a matrix concluding the performed analysis.

Chapter 8 – GAP-Analysis: The analysis chapter combines findings from market with ÅFHP in a GAP-Analysis where gaps are identified between market demand and ÅFHP's performance. Each growth factor is analysed individually where customer request, ÅFHP performance and identified gap is systematically analysed.

Chapter 9 – Recommendation: The recommendation from this research is presented in this chapter divided between each growth factor. The recommendation is based on the earlier identified gaps where the focus is on how to minimise or close these gaps.

Chapter 10 – Conclusion & Discussion: This chapter begins with a discussion about the research, its methods and results. Further on the conclusion is presented by a recap of the research question and its sub questions where the answers to them are provided. The chapter ends with a section where the researchers propose areas for future investigations.

2. Theoretical Framework

This chapter will go through relevant theory and present framework for analysis of data. It will present a framework for assessing new and existing market need and an internal view of the firm. The presented theories and two sub-frameworks will then be combined into a larger framework, which is used for recommendation of growth strategies.

2.1 General framework

The views of what should be taken into account when engaging in strategy development is divided into two different fields. The first one, external factors, argue that it is the business environment that matter the most and business opportunities should be found in the marketplace (Covin & Slevin, 2006; Sandberg & Hofer, 1988). Likewise, internal factors, as resources and capabilities that create a competitive advantage that should be used when entering a new market (Mahoney & Pandian, 1992; Grant, 2010). However, both these views matter in terms of strategy development since both the environment change and the internal drivers will be stretched (Johnson, Scholes, & Whittington, 2008). According to Grant (2010) the lack of consistency with the external or internal view is the reason to why the firm fail. A strategy is therefore believed to only be successful if it is consistent to the firm's external and internal environment. Porter (1980) argues for the same thing when he point out that relating the firm to its environment is essential when formulating competitive strategies. The basic structure of the main framework is presented in figure 2 and the concepts and components in each sub-frameworks; external-framework and internal-framework will be found by reviewing literature and the complete will be presented in the end of this chapter.

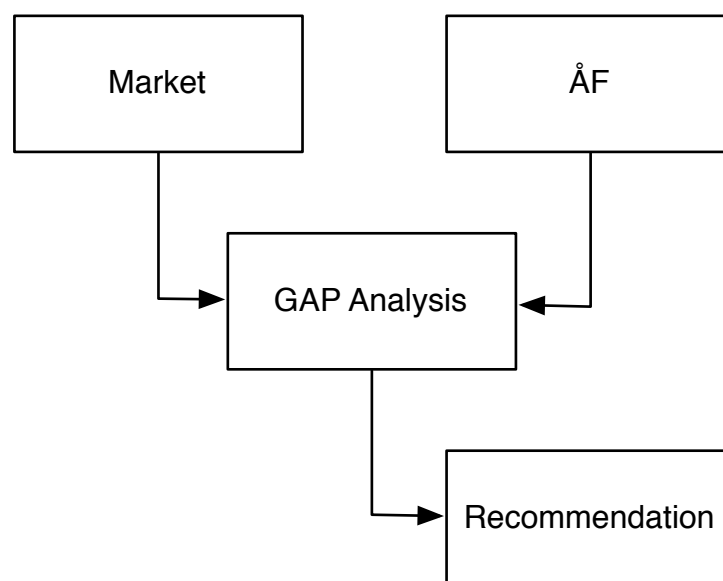


Figure 2 -Basic structure of main framework

2.2 Framework for analysis of market

The trend is that customers are more demanding and knowledgeable of what they want today and to be able to compete firms need to understand the customer (Kohli & Jaworski, 1990). By increased understanding of the customer's behaviour and needs it is believed that the firm will increase their sales. If a firm wants to perform above industry it must have a competitive advantage - delivering and creating sustainable value to their customers (Slater & Narver, 1994). Ohmae (1988) states that a successful strategy takes in to account the understanding of customer and an analysis of the firm's ability and flexibility to respond to these needs. Woodruff (1997) goes even further and claims that the next major source of competitive advantage will come from an understanding of the customer and how the firm should be organised to compete on delivering a superior customer value. To stay competitive in a niche market and gain a leadership position in that market, a precondition is to understand how to create superior customer value (Day, 1990). Understanding the customer and adapting the organisation to customer's needs is what Kohli & Jaworski (1990) say is a market-oriented view. The market-oriented view is based on three pillars and *customer focus* is the most central and important of these three (Kohli & Jaworski, 1990). In their research it was highlighted that the traditional view of being customer focused is about collecting information about the customers' needs and preferences are not enough and should also include what they define as *market intelligence*. The purpose of the concept, market intelligence, is to bring in not only subjective views from the customers but also other external factors that will influence the needs of the customers today as driving forces, market/business explanations and *future* needs of customers.

To further illustrate what strategy developing is about, and Mazzucato (2006) says it is about choosing new games to play and play the existing one better. Due to this the proposed market sub-framework will be divided into new and existing needs. An approach to assess the existing need of the customer is to relate needs to key buying criteria. Attributes and features of the product or service constitutes potential key buying criteria that customers use to evaluate their purchase decisions (Javidan, 1998). The existing needs in the hydropower market will be evaluated using key buying criteria of the customer and they will after an analysis of its attractiveness be a growth factor or not. The same logic will be followed in evaluating and assessing the new need of the customer. The new need of the customer will be addressed and explained by future trends and drivers by a market analysis. These two sub-market-frameworks will present possible growth factors.

2.2.1 External analysis for identifying existing needs in market

For a service to be strategically important to a firm it must have an advantage based on a differentiation valued by the customer. The differentiation takes place by attributes constituting a potential key buying criteria, KBC, for that specific niche and segment (Coyne, 1986). Typically there exist only a limited set of KBC which are important for the customer and they usually serve as a competitive advantage for the firm oppose to

other features that is usually not valued by the customer (Duncan, Ginter, & Swayne, 1998; Coyne, 1986). Grant (2010) relates customer need with how and what a firm should do to survive and be competitive and says that the firm should ask themselves following questions;

- What do our customers want or need?
- What does the firm need to do to meet those needs?

The first question is consistent as what Coyne (1986) explained and named key buying criteria and that is what Grant (2010) says is a source of profit and success. In that stage of the analysis there is a need to define who the customers are, explain what their current need is and how they value different offerings. The second question's aim is to highlight how and what the firm should do to meet those demands. Grant (2010) denotes them, as key success factors, KSF.

The framework to analyse needs in the existing market follows a sequential model, presented in figure 3, starting in the current and expressed need of the customer. Following is the analysis for identification of customers key buying criteria, KBCs. The KBC:s are as mentioned above crucial to be met by the firm to be competitive. The KBC:s are analysed and key success factors, KSF:s, are identified based on the KBC:s. The outcome of the model is analysed existing needs in-terms of a growth factor or not.

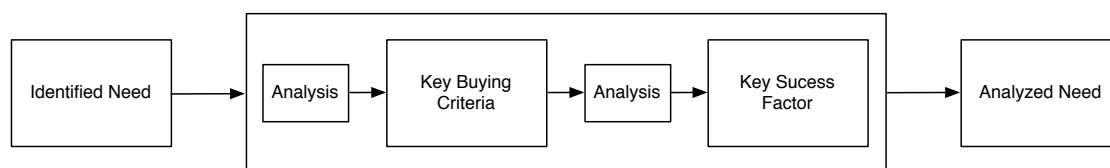


Figure 3 – Framework for analysis of existing need (Grant, 2010)

2.2.2 External analysis for identifying new needs in market

When developing a strategy it is crucial to understand how the firm is affected by the macro- and industrial level trends in market (Kaplan, Norton, & Barrows Jr, 2008; Grant, 2010).

Aaker (2001) argues that market trends are one of the most useful elements of external analysis. According to Grant (2010) a scanning of the business environment can identify the external factors affecting it. The PESTEL framework, which considers the political, economical, social, technological, environmental and legal factors, is a recommended framework to analyse the future impact of different trends on the market (Johnson, Scholes, & Whittington, 2008; Kaplan, Norton, & Barrows Jr, 2008).

In the external analysis it should be included an industry level analysis (Kaplan, Norton, & Barrows Jr, 2008). Aaker (2001) defines different dimensions of a market analysis where it is suggested to evaluate actual and potential market size, market growth and market profitability.

Actual and potential market size

It is important from a market analysis perspective to be able to estimate the size of the market as well as submarkets, if any. The estimation can be based on secondary data from government or trade-organisation but also sales from public financial sources. The potential market can be relevant to consider since a change in usage can transform the market size significant. (Aaker, 2001)

Market growth

To be able to understand how large the market will be in the future it is important to understand the growth of the market. Market growth can be equivalent to more sales and profit as well as less price pressure and would therefore considered to be attractive. With the same argument a declining market can be very unattractive. To understand if the market will grow or decline it is important to identify and understand the driving forces behind the market. The driving forces will help to describe how a market will behave. In some cases historical data, such as demographic data or sales of related equipment, can help to forecast the growth or decline. (Aaker, 2001)

Market profitability

Some markets are profitable and others are not. Porter's five forces estimate how profitable an industry is. The problem is to understand how profitable the average firm is. Porter's framework can be applied to industries as well as markets and submarkets. (Aaker, 2001) The competition within an industry depends on five forces; Threats of new entrants, Bargaining power of buyers, Threats of substitutes, Bargaining power of suppliers as well as rivalry among existing firms (Porter, 1980). In this thesis, where the market for technology consultancy services is the platform for investigation, the bargaining power of suppliers will be trivial since the suppliers that the firm has are not related to the services they perform. Following each of the other forces are further described:

Threats of new entrants: When new entrants enter a market they want to gain market shares and bring new capacity to the market, often with a pressure on price or increased costs as result. The threat of new entrants is depending on how high the barriers to enter are. If the barriers are high and the response from actors within the market are rapid the threat of new entrants are low. (Porter, 1980) The threat of entrants, and not the entrants itself, might be sufficient for actors within an industry to keep the offer competitive (Grant, 2010).

Bargaining power of buyers: Customers can, if they have sufficient amount of power, force actors within the industry to lower prices, increasing services or quality as well as playing actors against each other. All these activities will affect the profitability of the industry. Things that affect the bargaining power are the volumes, level of standard of product or service, how much it cost for the customer to switch supplier as well as how important the product or service is for the core business of the customer. (Porter, 1980)

Threats of substitutes: The actors within an industry are competing against products or services that can replace the one sold in their industry. The substitute limit the profit of the industry since the substitute, when showing are more attractive price/performance curve, will outcompete the existing offering. (Porter, 1980) If a close substitute exists, the customer will switch to it when the existing offering becomes too expensive (Grant, 2010).

Rivalry among existing firms: When actors within an industry see opportunities to improve its position, rivalry among the existing firm take place. Other actors within the industry feel the pressure. Due to that other actors are affected by one actor’s actions, they are mutually dependent. This factor is usually the one that affect the profitability within the industry the most. From a market perspective this rivalry can be positive in terms of offering but it can also lead to unhealthy in the long term. Factors affecting the rivalry are amount of competitors, industry growth, and amount of differentiation as well as high exit barriers. (Porter, 1980)

Based on Aaker’s (2001) proposed way of analysing market combined with the description of profitability and trends following framework was constructed, figure 4. The framework should analyse new customer need identified by the empirical findings.

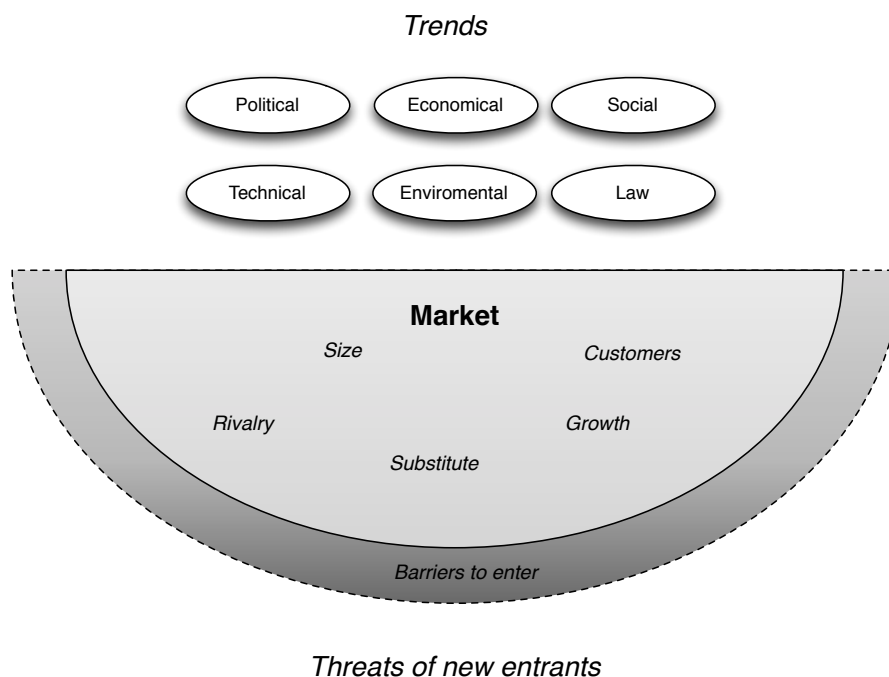


Figure 4 - Framework for analysing new business opportunities (Aaker, 2001; Johnson, Scholes, & Whittington, 2009; Kaplan, Norton, & Barrows Jr, 2008)

The use of PESTEL framework identifies the drivers behind the identified customer needs and explains why they occur as well as how sustainable they are. Further, by using the framework, the customer need is evaluated systematically with the factors identified important by the literature. The factors within the market: size, growth,

customers, substitute and rivalry are examined as well as the threats of new entrants into the market and the barriers for them to enter.

The outcome of this framework are growth factors in terms of analysed new customer needs that will be used in chapter 8 together with growth factors from existing customer needs to map against the resources and capabilities analysed in chapter 7.

2.3 Framework for internal firm analysis

Despite having the same market and business environment, different companies will perform differently - some will have superior performance and others will have moderate or even poor (Woodcock & Beamish, 2003). A present example is the cellphone market, where Apple has a considerable performance compare to its competitor Nokia who is struggling to keep up in this competitive market. What is the explanation of this superior performance? The concept of resource-based view tries to explain the differences in performance by considering the uniqueness of each firm. Firms that try to copy others will perform as others but by utilizing the differences the firm has it will have a different performance (Barney, 1991; Grant, 2010). The performances of the disparate firm are the differences in their internal strategic capabilities and not the external environment. Strategic capabilities can be defined as the resources and competences of an organization need to stay competitive (Johnson, Scholes, & Whittington, 2009; Woodcock & Beamish, 2003). With this view the strategy development is based on exploiting firm specific strengths as resources and capabilities.

2.3.1 Resources and Capabilities – potential sources to stay competitive

The initial stage in developing the framework for internal firm analysis is to evaluate resources and capabilities. The categorization of resources varies among different authors and the categorization Barney (1991) uses is Daft's (1983) definition of resources as; all assets, capabilities, organizational processes, information and knowledge controlled by the firm. During the years the resource concept has received a more specific definition and distinction. Grant (2010) defined resources, as the productive assets that are owned by the firm and capabilities are what the firm can do with these resources. The concept of resources can as Grant (2010) states be divided into two different types; tangible and intangible resources. This definition is however believed to be too narrow and limited in identifying and classifying different sources of competitive advantage for the framework that will be developed. A suggestion is instead to use Mills et al (2002) categorization of resources where resources are divided into six categories in the figure 5. This categorization will be used for the internal analysis.

Resource classification	Examples of type of resources
Physical resources	Buildings, machines, patents, financial assets
Knowledge resources	Skills and experience of the staff.
System and procedural resources	IT support and computer programs
Cultural resources	Resources that is developed over time and it includes values, beliefs and behaviors
Network resources	Network between firm's personnel and the external environment as well as reputation and brand
Resources important for change	In-house resources needed to evaluate when valuable resources become outdated

Figure 5 - Categorization of different types of resources

Service firms are said to be more flexible to adapt to e.g. new business opportunities than firms producing a physical product, since service firms are less constrained having less tangible resources compared with the latter. The difference is that service firms have employees with knowledge, which are seen to be more flexible than a traditional machine. (Lövendahl & Revang, 2001) Therefore, it can be argued that knowledge resources are to be more important in the service industry than manufacturing industry and consequently it is believed to be necessary with a deeper clarification of different types of knowledge resources. The academic research about knowledge as a resource is divided into two research areas. Lövendahl & Revang (2001) claim that the pool of knowledge is a source of sustained competitive advantage, since knowledge as a resource and by its characteristics can be seen as a unique, hard to substitute and hard to transfer to others. These characteristics inherited by knowledge resources and combined with insights from Amit & Shoemaker (1993) it can be claimed that access to knowledge is important for service firm to be competitive and other types of resources, which are easily acquired, are not a source of competitive advantage. But if a service firm has a knowledge resource which competitors have not it serves as a competitive advantage. The second view the academics have on knowledge resources is based upon Teece (1998) who states that knowledge is a source of value creation, but not in perspective of quantity instead in how the knowledge is applied and combined in the value creation process. Prahalad & Hamel (1990) states that resources can be combined to create unique combinations were capabilities and core capabilities can be developed. Lövendahl & Revang (2001) say that these unique combinations would be a source to a knowledge-based sustainable competitive advantage.

The difference between the two ways is that the first treat knowledge as a resource and if the resources meet certain attributes (see chapter 2.3.3 Analyzing firm’s resource and capability) the firm have a sustained competitive advantage or a competitive advantage and the latter treat knowledge as one source together with other resources that in combination create value and a competitive advantage or sustainable competitive advantage. The perspectives from these two views will be taken in evaluating the firm’s competitiveness since these two perspectives are seen to be sources of sustainable competitive advantage.

Knowledge is a broad concept and it can be viewed in different dimensions suggested by researchers and most researchers divide knowledge in tacit and explicit knowledge. Tacit knowledge compare to explicit knowledge is harder to codify and share to others since it is embedded in the individual. There is a further distinction between knowledge that is contained on a individual level versus a collective level and Lövendahl & Revang (2001) present a way to illustrate the different knowledge that exists in a service firm in figure 6 and this will provide a foundation in identifying different types of knowledge.

	Individual knowledge	Collective knowledge
Information-based – “know-what”	Knowledge about the related task e.g fact	Databases, data about who knows what in the organization
Experienced-based – “know-how”	Tacit knowledge or subjective knowledge. E.g skills and acquired knowledge	Norms, routines, templates of making certain things
Dispositional-based	Personal knowledge, talent and intuition	Shared corporate culture and corporate identity

Figure 6 - Description of different types of knowledge

A concept often mentioned in relation to the resource-based-view is competencies. Competencies are usually defined as a combination of different resources and when combined it can be developed to specific competencies as skills and abilities in which resources and people are engaged in an effectively manner in the organization’s activities and processes (Mills, Platts, Bourne, & Richards, 2002). Competencies are characterized by a higher level of complexity than looking upon resources per se. Grant (2010) and Mills, Platts, Bourne, & Richards (2002) do not consider it to be any difference between

competencies and capabilities and they can be used interchangeably and hereafter the concept capabilities will be used¹.

As with resources can capabilities be defined differently depending on type and Grant (2010) defines capability as what a firm can do. To further describe the concept Javidan (1998) defines capability in a more nuanced way as the firm's ability to exploit its resources. Lopez-Cabrales, Valle, & Herrero (2006) state that capabilities can be more important for the competitive advantage than tangible resources. (Johnson, Scholes, & Whittington (2009) mention that a typical capability in a firm often relates to cost efficiency and management of costs.

When having defined different types of resources and capabilities they need to be found in the firm and Grant (2010) explains that it is relatively easy to find and identify a firm's different resources, an issue is however to find the capabilities of the firm. At the initial stage for discovering the whole organization's different capabilities Grant (2010) suggests two different methods to evaluate and find these capabilities; functional analysis – in perspective of all functions of the firm *or* value chain analysis – in perspective of the value adding activities within the firm.

However, identifying capabilities may still be complex and Lopez-Cabrales, Valle, & Herrero (2006) suggests categorizing capabilities into three areas; managerial capabilities, technical capabilities and output-based capabilities. Managerial capabilities are defined as the ability to create a vision and identity for the firm and being able to communicate these throughout the organization and motivate employees to achieve them. Technical capabilities are the value creation processes that transform input into valuable output. The capabilities are new combinations of resources, methods or systems to enable to solve actual and potential need from the customer. Output-based capabilities are defined as capabilities that create value to intangible assets as reputation and brand. If a firm gets associated with superior quality and delivery customers are willing to pay more for brand and reputation. Customer and loyalty also belong to this category and working with such capabilities will generate high sales and returns compared to competitors. (Lopez-Cabrales, Valle, & Herrero, 2006)

2.3.2 Competitive advantage and sustainability

When having identified the resources and capabilities they can be graded from a customer perspective in threshold or unique resources and capabilities. Threshold resources and capabilities are defined as the minimum requirements that have to be met by the firm in the given market. A changing market may create new needs, which will follow with new parameters to be met. Unique resources or capabilities are defined as sources to competitive advantage and are difficult to imitate or obtain. (Johnson, Scholes, & Whittington, 2009; Mills, Platts, Bourne, & Richards, 2002) The

¹ The word "competence" will be used for a distinction of different knowledge i.e. competence areas.

different types of categorization will be included in the framework in evaluating each resource or capability's competitive advantage.

As aforementioned competitive advantage is derived from the resources and capabilities that are available to the firm and is creating value for the customer. When formulating a firm's strategy it is important to analyze and understand the different resources that will be needed and when formulating new strategies and new resources might be acquired and developed. The wanted position for a firm is to possess resources with characteristics of being sustainable and with performance above competitors. The firm will then have sustainable competitive advantage and capabilities, which according to Woodcock & Beamish (2003) is the most valuable advantage a firm can have. A resource or capability with sustainability attributes is defined as a resource that does not diminish its competitive advantage with time.

2.3.3 Analyzing firm's resource and capability

To stay competitive managers need to understand what resources and capabilities that will be needed to maintain its position on the market and to grow. It is believed that that resources and capabilities with attributes that offer competitive and sustainable advantage are of special interest and it will be included into the framework of evaluating resources and capabilities. A way to analyze the attributes of a resource or capability is to evaluate them to see if they create value for the customer and are sustainable in future. The more attributes a resource or a capability have, the more important it is for the firm and its competitive advantage and sustainability (Barney, 1991). Barney (1991) suggest different criteria to use to evaluate a resource and capability and by introducing the VIRO-framework they are presented in the figure 7 below.

Wanted attributes of the resource/capability	Question to be asked to evaluate
Valuable	Does the resource or capability create value for the customer?
Imitable	Will the resource or capability be less important for the customer over time?
Rare	Can the resource or capability be acquired easily?
Exploitable by the organization	Is the resource or capability exploited by it full potential within the organization.

Figure 7 - VIRO-framework for evaluation of resources and capabilities

When having identified a resource or a capability with attributes that offers a sustainable competitive advantage Javidan (1998) states that it will with time be developed to a core capability of the firm and it will be central for the strategy development in future. Javidan (1998) also presents a way of where to look in the

organization for the different concepts and also how the degree of value and imitability change regarding of the concept see figure 8.

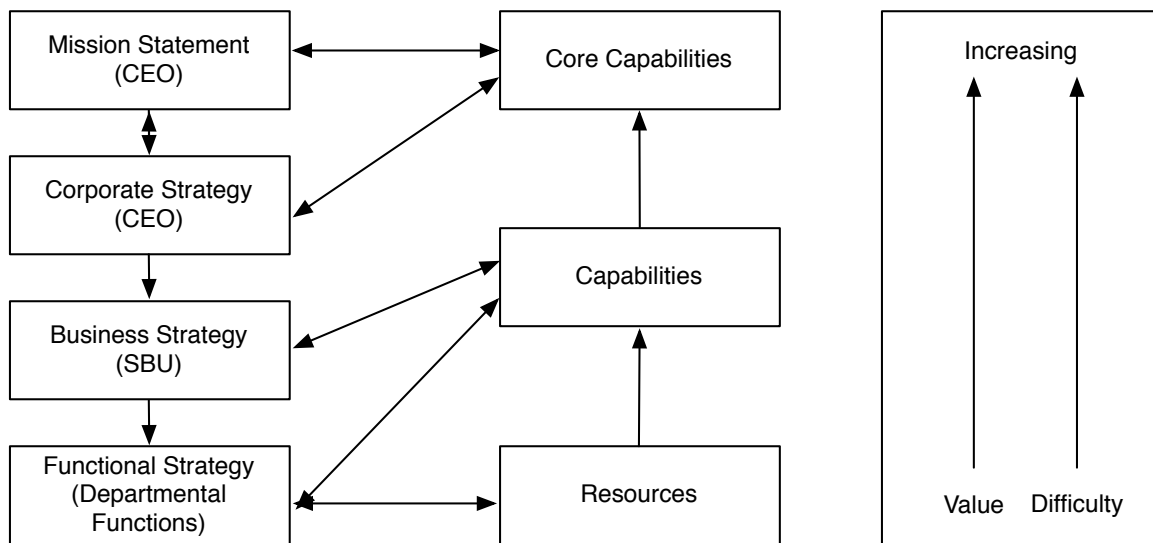


Figure 8 - Increasing value and difficulty with increasing organisational level.

2.3.4 Differentiation

Differentiation is a strategic choice done by a firm to differentiate it from competitors. Specific capabilities can if they are considered as a core capability be strategically important if they differentiate the firm from its competitors (Leonard-Barton, 1992). Treacy & Wiersema (1993) state that a customer usually defines value of a product or service as a combination of price and quality. Kaiser and Ringlstetter (2011) describe and emphasize that the quality aspect is of higher importance for services the professional service firms deliver and it is nowadays seen as a possible differentiation aspect more than before. There are three differentiation approaches in the service market. A service firm can work with increasing their reputation and that would lead to an increased perception of the service firm. Secondly, it can strengthen the business relation, the quality perceived by clients will increase since the consultant will understand the customer needs better and can tailor solutions better. Lastly, service firms can differentiate by developing the knowledge basis and that will enhance the perceived service quality. (Kaiser & Ringlstetter, 2011)

2.3.5 Internal framework to evaluate the firm

The framework to evaluate and find resources and capabilities is derived from the previous literature review, which introduces the necessary concepts within the research area see figure 9. The input data is the empirical findings and this proposed framework will assess it and resources and capabilities will be evaluated. The proposed framework is a sequential model with different steps and screening filter as the VIRO-framework to evaluate specific resources and capabilities, which are important for the firm to stay competitive.

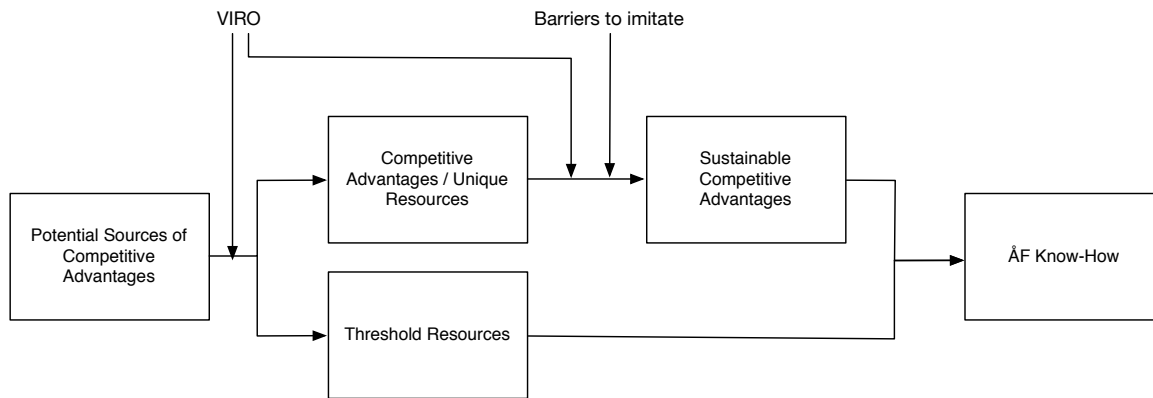


Figure 9 – Framework for analysing resources and capabilities (Barney, 1991; Johnson, Scholes, & Whittington, 2009; Mills, Platts, Bourne, & Richards, 2002)

2.4 The proposed main framework

The head framework for this thesis, presented in figure 10, is analysing both the external and internal factors as proposed by Johnson, Scholes, & Whittington (2008) and Grant (2010). The analysis of the external side, the market, identifies growth factors derived from new customer needs and as well as existing. As presented internal factors as firm’s resources and capabilities are in focus for the internal sub-framework. The head framework then combines findings from these two sub-frameworks into an analysis where each growth factor found in the empirical context is mapped against the firm. The purpose of the analysis is to determine how the firm should arrange and organise its resources and capabilities based on the market in order to reach the vision and implement the strategy. The concept of relating the firm with its external market in strategy development is denoted strategic fit. For a successful strategy development a firm’s vision, resources and capabilities are coherent with the market need (Stevenson, 1986; Grant, 2010). The GAP-Analysis establishes what potential gaps exist and the nature of they (Andersson, 1996). The recommendations will be how to close any potential gaps identified. Lastly, recommendations are provided based on what the firm can do to, if any found, minimize the difference or strengthen any resource or capability.

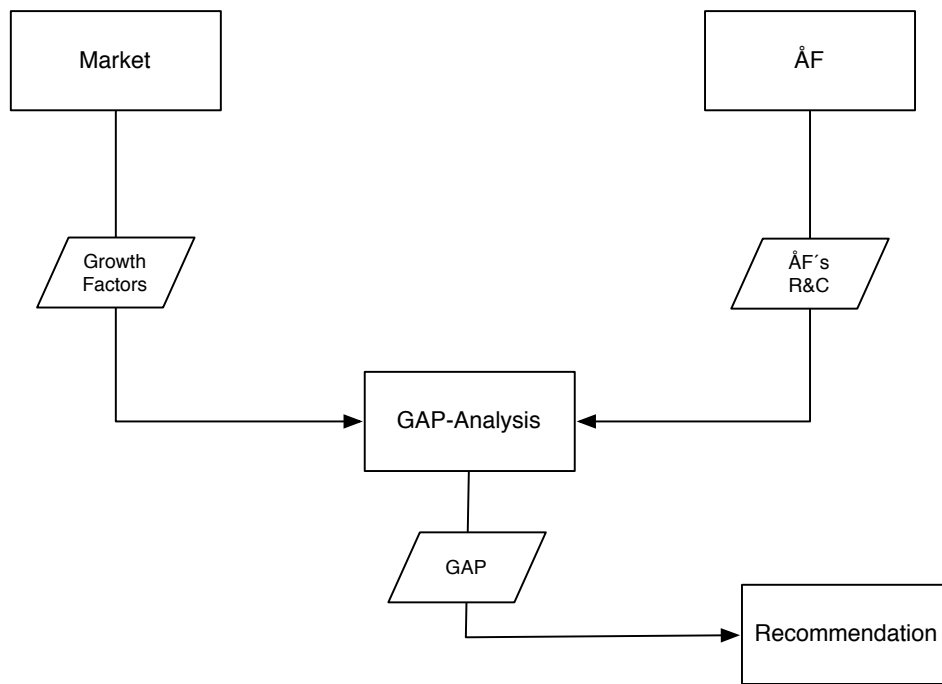


Figure 10 - General framework (Johnson, Scholes, & Whittington, 2009; Grant, 2010)

3. Method

This chapter presents different methods used in this thesis. Firstly, research process and strategy are presented followed by description of the methods used, table of performed interviews as well as information of sampling. Lastly, the quality of the thesis is discussed according to different quality criteria.

3.1 Research process

To present an overview of how this research has been conducted the research process is presented in figure 11. The research process was set up to be able to get an overview of the workflow of the project as well as to be able to distribute the time for the thesis. The research process is presented as a linear model but it is important to understand that different steps in the process were processed simultaneously.

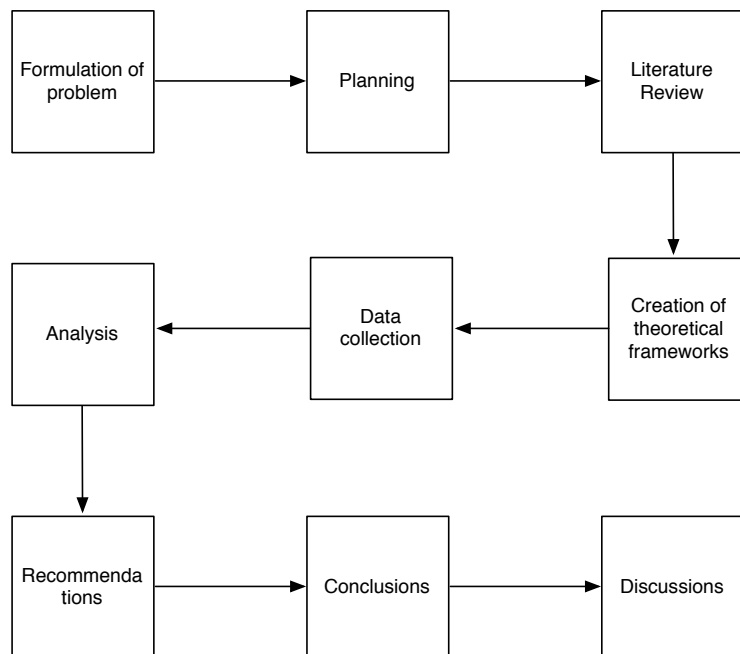


Figure 11 - Research process applied in thesis

The first process of the research was to define the problem that should be investigated. The problem and subject of thesis was discussed with supervisors from both ÅFHP and Chalmers, which ended up in a defined scope and focus of the research. The planning was structured based on the defined research, which generated steps that were planned according to the time-schedule set.

After these initially processes the thesis started with a literature review of relevant areas to be able to create a foundation of the theoretical framework. Following, the frameworks were created which entails which data that should be collected and how it should be analysed.

When the frameworks were established the data collection started. Initially templates with interview questions were created based on the research questions and of those

generated decomposed questions. Since the researchers believed that the market interviews would be more difficult to book, which in retrospect turned out to not be the case, it was those that were booked and performed firstly. However, during this process, the interviews from market and ÅFHP have been performed alternatively.

The analysis was made when the data was collected. The market and ÅFHP were analysed separately firstly and then combined in an analysis. Based on the analysis recommendations were created which is the main result in this thesis. The conclusions were based on these recommendation and findings in the research. Lastly, the research and the result are discussed.

3.2 Research strategy

According to Bryman & Bell (2011) it could be useful to distinguish between qualitative and quantitative research. The difference between these two strategies in general is that a researcher using quantitative research strategy use measurements when the qualitative researcher does not. The different research strategies affect the way data is collected and analysed. In quantitative research strategy the researcher emphasize a quantification of data where the qualitative researcher instead emphasize the use of words rather than quantifications.

In this research the main objectives are to investigate market dynamics and map them against a firm's resources and capabilities. The research strategy in this thesis has predominant been qualitative. The sample is relative small and even if the data from the questionnaire is quantitative it was used as a way of increase the quality of the thesis and the overall results of this research is grounded on qualitative data collected.

3.3 Research design

This thesis was designed as a case study. According to Bryman & Bell (2011) a case study focuses on a detailed and intensive analysis of a single case. A case study focuses on a bounded situation, which it intensively examines the setting within. The case is an object of interest in its own right, which the researcher aims to provide an in-depth investigation of. Usually the researcher aims to elucidate unique features of the case instead of generating findings applicable regardless of time and place. (Bryman & Bell, 2011)

In this thesis the organisational boundary is the hydropower section at ÅFHP acting on the market for technology consultancy service for hydropower in Sweden. The reason for design this thesis as a case study was to be able to investigate both the market and ÅFHP internal in depth. The authors did not have the intension to generalise the findings beyond the organisation and did therefore chose to define the research to the earlier mentioned organisation and market.

3.4 Research methods

In the thesis different research methods were used to collect data. The reason for using different methods was to ensure a triangulation with both data sources and methods. The methods used in this research were interviews, questionnaire as well as external and internal secondary data. Following each of the methods is further described.

3.4.1 Interviews - market and experts

The interviews were of semi-structural approach where questions were pre-defined with several sub-questions and depending on the respondent's knowledge and answers the different questions and sub-questions were discussed in different amount. 13 interviews were performed with existing and potential customers for technology consultancy services within hydropower in Sweden. Two interviews were performed with researchers within the area of hydropower and two interviews with two different trade organisations were also performed. The interviews varied in time between 20-50 minutes depending on how extensive the answers were combined with how broad knowledge the interviewee had. One researcher performed the interview by following the template created while the other researcher took notes continuously and asked follow-up questions if appearing.

3.4.2 Interviews - ÅFHP

For the interviews at ÅFHP the same approach as for market interviews was used. Depending on the interviewees' background and knowledge different areas were discussed but within the same structure for all interviews. Eight interviews have been performed with manager and senior consultants with long experience of the company as well as the market. The interviews varied between 30-70 minutes depending on the depth in knowledge and answer from the interviewee.

In Appendix 1 all interviews on both market and at ÅFHP are presented with interviewee's position, date when the interviews were performed as well as length of interview. The name, Respondent X, is the terminology used further in thesis when referring to data stated in interviews. The abbreviations of the positions are described in Appendix 2.

3.4.3 Questionnaire - ÅFHP

A questionnaire was sent out to all consultants employed within ÅFHP in Sweden. The questionnaire was constructed from a web-based template format and was containing seven questions regarding resources and capabilities within ÅFHP. It was sent out to 47 respondents, from junior consultant to senior manager by e-mail including link to the survey together with an introducing letter containing description of thesis, questionnaire and contact details to the researchers. 36 respondents started the questionnaire and 29 had completed it when the time frame of one week had ended. The time frame can be argued to be too short and due to that a weakness in the sampling. It was necessary for the thesis time-plan to keep the time frame short to be

able to analyse the results. The reason for why some of the respondent did not complete the questionnaire is not clear. It can be argued to be due to lack of time for the respondents or incentives to perform it.

3.4.4 Internal and external secondary data

Internal data has been used to describe ÅFHP's structure, goal and competencies. The data has been in form of internal notes from conferences, company information to new employees and presentations for customers.

The external data used in this thesis is mainly information regarding the market. It has used reports from trade organisations, papers from researchers as well as governmental information. All this data has created a base in empirical context for the market.

3.4.5 Other types of data collection

During the time of this research the researchers have been using two other types of data collection that have been more of informal data collection sessions.

The researchers attended two workshops days arranged by trade-organisations. The first one was a general trade-organisations day called "SVC-dagarna" which gave the researchers a platform of contacts where it was possible to discuss the topic of the research. The second workshop day was specified on dam safety called "SwedCold". On this workshop the different governmental investigations were presented and further discussed.

The researchers also visited two hydropower plants in Trollhättan where a guide from Vattenfall presented how the system was working in Trollhättan followed by a tour on their two plants. This session gave the researchers a better overview of the system together with insights to the industry from a producer's perspective.

3.5 Sampling

Market: To identify persons suitable to interview in this thesis a group of companies were identified with help of secondary data identifying companies assessing hydropower plants. Initially it was eight companies that were identified which together supply 97.5% of the hydropower electricity produced in total in Sweden. The interview persons were identified through contact with persons at public relation and human resources departments at these companies to which the subject for the thesis was described. The result of this process was usually one person that these departments were considered relevant to the subject. These persons were invited by e-mail where the subject for the interview was described. From these interviews snowball sampling was used to identify further persons within the specific company that have insights into the area investigated. According to Bryman & Bell (2011) snowball sampling, to use relevant persons within a small group to establish contact with others, is in no way a random selection and therefore unlikely to be representative. However, since

probability sampling is not relevant for qualitative research, theoretical sampling is useful since it focusing on identifying categories.

ÅFHP: The sampling process at ÅFHP was divided into two different methods and sampling strategies. The interviews performed internal at ÅFHP was chosen through discussion with the supervisor. According to this discussion all managers within the hydropower section was chosen together with two managers from other sections that are in collaboration with the hydropower section as well as two senior consultants that have long experience of ÅFHP as well as the market. The questionnaire performed internal at ÅFHP was sent out to all consultants within the hydropower section by email including a link to a web survey. The researchers did not consider it necessary to delimit the sample size since the total amount was reasonable to handle.

Figure 12 present the research questions and how they were decomposed. The decomposed questions were the foundation to questions asked in the different interviews. With internal means persons or documents within ÅF and with external outside ÅF. The table also describe how the different questions have been triangulated with different data sources collected by different research methods.

Sub-question	Decomposed Question	Primary Data			Secondary Data		Sources
		Interview		Questionnaire	Internal	External	
		Internal	External	Internal			
Which growth factors will be important within the hydropower market?	How does the Industry look like today?	x	x		x	ÅF, Customers, Trade-org and Experts	
	What driving forces can be identified?	x	x		x	ÅF, Customers, Trade-org and Experts	
	What challenges will the industry face?	x	x		x	ÅF, Customers, Trade-org and Experts	
	How will the industry look like tomorrow?	x	x		x	ÅF, Customers, Trade-org and Experts	
Which resources and capabilities does ÅF possess today?	How does ÅF's business network look like?	x			x	ÅF	
	Which services does ÅF offer today?	x	x	x	x	ÅF, Customers	
	How is ÅF organized?	x			x	ÅF	
	How does knowledge creation and sharing work?	x		x	x	ÅF	

Figure 12 - Method table

3.6 Analysis of data

The analysis of data has been performed essentially in three parts. The market was analysed according to created framework based on type of need the customers had.

The origin of all needs was explained by the PESTEL analysis, which gave an extensive explanation for the underlying trends. Both new and existing needs were then analysed according to its frameworks. Those identified as attractive and important for growth within the market were classified as growth factors and were brought into the GAP-Analysis.

ÅFHP was analysed according to the framework created for it. The resources and capabilities were identified in the empirical context and brought into the framework to analyse its importance and sustainability. The outcome of this analyse was brought into the overall analysis to map against the growth factors.

By mapping ÅFHP's performance according to the growth factors identified in earlier analysis the overall analysis was performed. The customers' requirements for each growth factor were mapped against the performance of ÅFHP and gaps were identified. Based on this gaps recommendations were given to how ÅFHP can work to minimise and close these gaps and by that utilise the growth factors.

3.7 Research quality

Yin (2003) identified a model for investigation of quality of a case study. The model defines four aspects of quality criteria; Construct-, Internal-, External validity and Reliability. Following each one of the criteria is explained, all from Bryman & Bell (2011)

Construct validity: Construct validity concerns how well the measurement chosen for a concept really succeeds to measure it. If a measurement fails to measure the concept, the findings of a research should be questionable. A measurement that is unstable and fluctuate and therefore also unreliable should not be used as measurement of a concept.

Internal validity: Internal validity relates to the issue of causality. The internal validity is high when a causal relationship between variables is sustained and where a variation in one of the variables, and only this variable, will cause a change in the dependent variable.

External validity: The external validity raises the question of whether the findings of the research can be generalized outside the context covered in research. For a qualitative research it is crucial to ensure a representative sample to be able to generalize the results for a greater population.

Reliability: If the result of the research is repeatable the research is reliable. In quantitative research the measure of reliability is concerned of if the measure is stable or not. A research is stable if it has a clear research process, well defined research question, the study has been done with care and the data is readily available.

To evaluate the quality of this study each one of earlier mentioned quality criteria's has been evaluated by self-assessment on a scale with low, medium or high. Figure 13 show the result from this evaluation together with the motivation of chosen performance.

Quality Criteria	Performance	Motivation
Construct Validity	High	<ul style="list-style-type: none"> • Different methods and data sources have been used for each question • Result has been presented for and discussed with external parts
Internal Validity	Medium	<ul style="list-style-type: none"> • Structured and clear analysis of data • Thick descriptions with internally coherent findings • Multiple sources of data with different angles on questions and problem • Do not relate concepts systematically
External Validity	Low	<ul style="list-style-type: none"> • Case-studies are per definition difficult to generalize outside the scope of investigation • The extensive investigation of market can be generalised outside the scope of ÅFHP • Theoretical model for investigation possible to generalise
Reliability	High	<ul style="list-style-type: none"> • Clear research question decomposed into researchable sub-questions • All data used is documented and available • Stable measurement at market, can change due to political influences

Figure 13 - Research quality

4. Empirical Findings Market

This chapter will present empirical information regarding the electricity market, give an introduction to hydropower and also present factors that will influence the market in future.

4.1 Electricity market

In Sweden, the total amount of electricity produced 2011 was 146.9 TWh. 66 TWh out of this was produced by hydropower and 58 TWh from nuclear power which together count for 84 % of the total production. Wind power is only a small part of the production with its 6.1 TWh. The distribution of the different sources is presented in figure 14. Wind power has experienced a huge growth compare with 2010 production of 75 % when the growth of other sources was only a few percent, some even declining. The production from nuclear and hydropower plants has been reasonable stable. (Svensk Energi, 2012) 2000 was the production of electricity 149,9 TWh distributed between hydropower (49,7 %), nuclear (43,9 %) and combined heat and power (6,1%) (Svensk Energi, 2002).

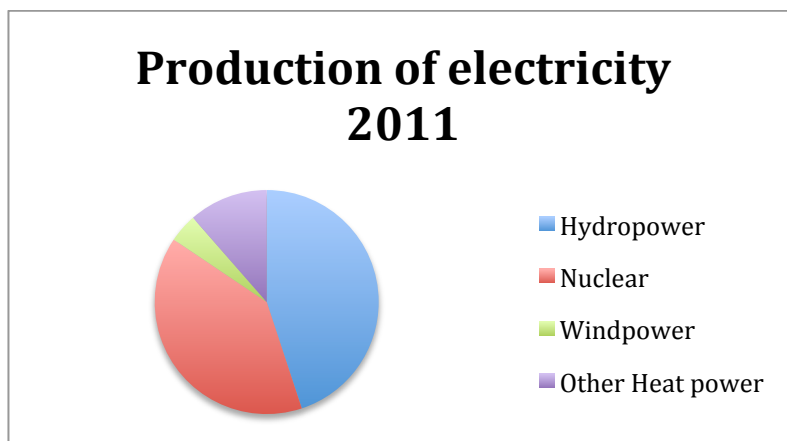


Figure 14 - Distribution of electricity production

4.1.1 Electricity price

The electricity price in Sweden is as other merchandise set by demand and supply. The demand is primary set by two reasons; the economic situation, in hot and growing markets the demand will be high and vice versa. Secondly, it is also influenced by the time of the year and weather condition (E.ON, 2012). Supply is influenced by the most common energy sources in Sweden as hydro power and nuclear power and in next step the changes in price is set by precipitation, the ability to store water in reservoirs and reliable nuclear power plants. In addition, neighbouring countries in the Nordic and also in Europe also affect the supply. If the price of oil and coal raises the price for electricity will do as well (E.ON, 2012). Marginal pricing sets the electricity price and therefore is the price set by the last energy source needed to meet the current demand (Svenska Kraftnät, 2011).

4.1.2 Certificates

Certificates for production of renewable electricity were introduced in Sweden 2003 as an incentive to produce more renewable electricity and stimulate the market. Electricity produced from wind, solar, waves, geothermal, bio, peat or hydropower is qualified for the certificates. However, since the certificates should stimulate development of new renewable production, facilities existing before 2003 only qualify for the certificates until end of 2012. If reconstructions have been made to the extent that the plant can be considered new, the whole plant is qualified for certificates. If not, only the increased capacity is qualified. Svenska Kraftnät hands out the certificates to the producer based on amount of electricity produced. The producer then sells the certificates to the customer together with the electricity. The price of the certificates depends on the market. Since the introduction 2003 has the price varied between 0,15 to 0,40 SEK/kWh. Depending on the source of electricity and price of electricity the income from certificates can count for up to 50 % of the total income for the producer. (Energimyndigheten, 2010)

4.1.3 Increased use of renewable sources

The Swedish government has a vision that Sweden should not have any net CO₂ emissions by 2050 (Svensk Energi, 2012). The production of electricity has a large impact on this vision since it not only affects the emission directly but also in other sectors of the market. The increased use of sources of electricity production with an irregular production such as wind and solar demand a base of production with the possibility to adjust production to stabilize the system, named as regulating power. Today, some of the hydropower in Sweden has the possibility to offer regulating power due to the use of dams and reservoirs where the production can be controlled. However, due to the uncertainty in amount of irregular production, the amount of regulating power that will be necessary in the future is uncertain (Teknikföretagen & Svensk Energi, 2011).

4.2 Hydro power market

In Sweden hydropower is a major source of renewable energy and today almost half of the production of electricity originates from hydropower. Hydropower had its breakthrough in nineteenth century in Sweden (Newsroom Vattenfall, 2012) and today there are 1800 hydro power stations with various power-generating output where 200 are counted as large-scale with an installed power above 10 MW (Jönsson, 2011). There is a geographic and topological difference of Sweden, which offers different opportunities to build hydropower plants. The large hydro plants are built in northern Sweden, where the installed output is large relative to the number of hydropower plants and the opposite view can be seen in southern parts.

The market for hydropower is by stakeholders in industry classified into large-scale hydropower and small-scale hydropower. The later small-scale hydropower increased from the beginning of 1900 to 1940, but after investments in large-scale hydropower

took over in north of Sweden and together with the introduction of nuclear power, small-scale hydropower was not seen to be economically viable anymore and decreased in number and in 30 years time 2000 were shut down. In late 1980s support from the government and followed by certificates the number have started to increase again. In future predictions the growth rate in electricity production from hydropower in Sweden will be almost to zero as presented in figure 15.

	Year					Annual % change	
	2010	2015	2020	2025	2030	2010-20	2020-30
Hydropower (TWh)	67.6	67.9	67.0	68.2	68.3	-0.1%	0.2%

Figure 15 - Future energy trends for hydropower production (European Commission, 2010)

4.2.1 Hydropower as an energy source

Hydropower is a two-sided coin it is a renewable energy source and does not give rise to any carbon emissions that will affect the climate or environment globally but in perspective of the local situation it offers an alteration in the environment and will affect the ecosystem to a certain negative degree. Due to its impact on the local environment it will be a noticeable change and the preservation of the remaining untouched rivers has been an argument against further expansion. (Vattenfall AB, 2012) The parliament has declared that the four remaining big rivers; Torne-, Pite, Kalix and Vindelälven shall be untouched and is therefore protected in miljøbalken (Kungliga Vetenskapsakademiens Energiutskott, 2009). In the societal level, there is a support for hydropower as a source of electricity. At political level there is a consensus that hydropower is a decent energy source to replace fossil based sources. The negative opinions that arise are related to planning of new plants and their impact in the landscape and today there is less critique to existing plants (Vattenfall AB, 2012). Sundby (2010) claims that the potential of new hydropower is 1-2 TWh in Sweden. With full potential of both economical and technological considerations there is another 90 TWh to add. To only look to technical considerations there is 135 TWh and theoretically 200 TWh. (Sundby, 2010)

4.2.2 Building cost associated with hydropower

Constructing a new hydropower plant is related to high initial fixed costs. Large-scale hydropower with storage is between 7350 SEK/kW² and 54 000 SEK/kW, while the small-scale hydropower ranges between 9100-56 000 SEK/kW. Refurbishments and upgrades face a lower upfront cost of 3500-7000 SEK/kW. Annual operations and maintenance of the plants is a relatively low cost in comparison to other sorts of power plants and quoted as a percentage of the initial investment cost per kW. For small-scale hydro it ranges 1-4 %/year but up to 6 % are possible and the explanation is that small-scale hydro does not benefit from economies of scale whereas large-scale is lower with 2-2.5 %/year. The cost of electricity generated by hydropower is low and for large-scale

² 1 USD = 7 SEK

hydro it ranges from 0.14-1.33 SEK /kWh, with a 10 % cost of capital and the lifetime of a hydro plant is more than 50 years, relative other energy sources hydropower offers a competitive advantage. (IRENA, 2012)

4.3 Key factors affecting hydropower industry

The hydropower industry is affected of numerous external factors. It can be factors both regarding the income perspective, i.e the price of the electricity, that change and the cost perspective, i.e changes in legislation and investments. Following are the relevant factors presented.

4.3.1 Electricity price

The willingness to invest in upgrades in hydro power plants are linked to the price of electricity. The period of 80-90s was influenced by low electricity prices and much effort was to decrease the costs and that meant the producer postponed investments for the future. These investments have taken place and some projects are running today caused by that pasted market environment (Respondent17, 2012).

The deregulation in 1996 of the electricity market has caused the price to be more volatile and therefore change more between its more extreme points. In a ten-months-period the price of electricity has fallen from 0.80 to 0.30 SEK and this is according to Respondent7 (2012) not healthy for the industry and for future investments. A calculation done today is not feasible with present prices, but it was two years ago. This view is consistent with several of the respondents that the price of electricity is low and that affects the level of investments. Worth noting is that the hydropower plants are not unprofitable at this level according to Respondent13 (2012) and in a ten-year period electricity prices have increased from 0.13- 0.40 SEK (Respondent17, 2012). The same view can be seen in the figure 16 from Nordpool is that the price from 1996 has steadily increased but the volatility has also increased with time and frequency.

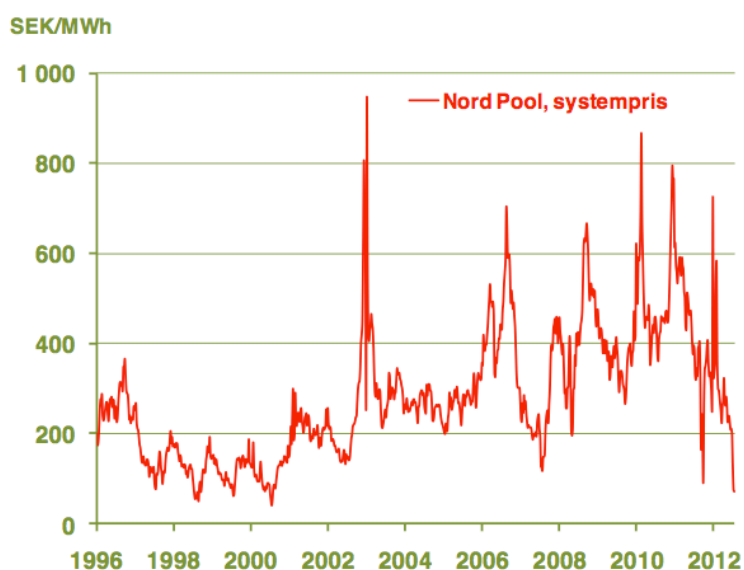


Figure 16 - Spot price of electricity on Nord Pool, (DN, 2011)

4.3.2 Political influences

Energy and politics are intertwined and related to each other. The society and a nation's welfare needs energy and today more effort is focused that energy has to come from a sustainable production and to be environmental friendly. In history less focus was put on the environmental impact from hydro power plants but with time when more plants were installed and the change in environment became prevalent also the rules and regulations were introduced. Different laws and rules have passed during the last century. A hydropower plant constructed before 1882 and with a turbine installed before 1919 is protected by something called "*urminnes hävd*". *Urminnes hävd* is an old civilian right and a person who claims its right to its water even if it may affect owners downstream. The term is first stated 1734 in "*jordabalken*". With time the laws changed and took further notice upon economic considerations and 1881 came "*Vattenrättsförrordningen*" and in 1918 arrived "*Vattenlagen*" with purpose to be adapted to industry need to use hydropower, and it also had environmental concerns. The two new laws had no retroactive change on "*urminnes hävd*". In 1972 the "*urminnes hävd*" was abolished but was reinstated eleven years later. With the latest law 1998 "*miljöbalken*" it is still proclaimed that this ancient civilian right is valid. Hydropower plants that fulfil "*urminnes hävd*" are still legal but the permission to waterworks may be reconsidered. According to Alskog (2012b) less than a few percent of the hydropower plants follow the latest law "*miljöbalken*" and 90 percent of all plants have a permission according to 1918 "*vattenlag*", a law that is far away from today's environmental concerns.

Kommittedirektivet

Today, there are juridical cases where the usage of old laws is taken place, plant owners claim that production have been there since thirteen-century and should therefore be bound by these laws. The problematic situation that arises is that the country-law that existed by that period is not preserved today and that makes it troublesome to make a correct verdict. The principle is that the laws that existed when it was built set the conditions for hydropower plants and only a minor part of the plants need to follow the newer laws. (Alskog, 2012a)

To handle these problems the government has engaged in an investigation "*kommittedirektivet*" and to evaluate the legal power of older laws. The aim is to make newer and more modern environmental considerations also should affect all hydropower plants with the usage of *miljöbalken*, which will treat hydropower plants as a business that is harmful to the environment (sv. *Miljöfarlig verksamhet*) (Miljödepartementet, 2012). The concept is based on the principles that the polluter pays for damage and should use best available technology today in the production (Alskog, 2012a). According to Alskog (2012a) the aim of the investigation is clear; in future shall hydropower production be followed by newer laws and not by old laws.

The opinion of the investigation is clear from the respondents, Respondent13 (2012) and Respondent12 (2012) say it may change the rules for hydropower and it may decrease the number of large investments in future and it gives an uncertainty for the

future. The reasoning behind was that if the permissions have to be reconsidered again it might take fifty years until all have been processed and therefore there are incentives by authorities to find a model to generalize as finding a one-fits-all model or new directive to follow. (Respondent17, 2012) Today there is also a notion that an upgrade as installing a new turbine would lead to less production, since new permissions have to be granted and in some cases more water has to be by-passed the turbines and plant, so the upgrade is not as beneficial as expected.

EU's influences on Swedish hydropower

EU also subjects regulatory influences onto Swedish hydropower. A EU-directive, "ramdirektivet" or "vattendirektivet" is an agreement within EU-members where a baseline of water exists and must not fall below regarding quality or supply of water. The directive aim is to increase cooperation between countries and handle issues in the biological environment. In 2004 was EU-directive incorporated in Swedish law, "vattenförvaltningen", and the aim was to treat e.g a river as a whole system and not seen separately by nation or other local administrative borders. The law comprises surface water as lakes, watercourses and ground water and the goal is to achieve good water status, meaning sustainable water quality and efforts are taken to improve the quality by 2015. (Harlén & Kling, 2012)

The EU-directive takes diverse focus depending on where in Europe. In central Europe more focus is on firms within polluting industries close to rivers or firms transporting goods on rivers which compete with hydropower firms of the their right to use the river. Sweden has less of these firms and therefore has the focus in Sweden and in Nordic countries had another focus. The primary focus has been on the ecological impact hydropower has on the local environment and fish ways are something common to investigate (Respondent17, 2012).

Havs- och vattenmyndigheten, HaV, is the authority in Sweden, which has the responsibility of everything dealing with water and issues there in and they also provide long term planning of water (Oscarsson, 2012). Recently in November 2012 HaV delivered a report to the Swedish government. Based on insights and workshops with stakeholders in industry the aim was to find consensus in hydropower linked to the vision of renewable energy sources in future and environmental concerns linked to EU-directive. The outcome of the workshops was that hydropower need to be more ecological adapted if Sweden wants to fulfil the criteria of the EU-directive. HaV mentions that only 200 of 1800 hydropower plants have fish ways and it is unclear how many actually works and the rapid change in surface level many rivers have modest or low ecological status.

The view of EU-directive from the respondents are focusing on economic issues since the directive probably means less revenues, since the water through the turbines will decrease due to the fish ways enforced by the new law (Respondent4, 2012) and today is that seen as a major uncertainty for small-scale hydropower. This uncertainty is decreasing the willingness to invest in hydropower plants (Respondent10, 2012). In

addition, plant owners want higher dams to be able to offer more regulating properties, but it is against EU-directive (Respondent6, 2012). Respondent12 (2012) confirms that there is uncertainty relating to concepts as ecological status in the directive. Is it possible to define ecological status, Respondent17 (2012) asks if the baseline is set as its extreme equivalent to the Stone Age. The EU-directive affects all hydropower plants in Sweden but Respondent11 (2012) claims it would affect small-scale hydropower more since they have smaller dams and it is also considered easier to build a fish way or fauna way³ compare to the large-scale where the environment is already much affected and changed, so the incentives are not as large.

Increased real estate tax

All power-producing sources pay a real estate tax and it varies depending on how the power is produced and it depends on two variables; the real estate value and the percentage of the real estate value. The former, real estate value is expected to increase with 70 percent based on a proposal from the government (Löfstedt, 2012). The percentage of the real estate value has also gradually increased during the last five years for hydropower plants from 1.2 % in 2008 to 2.8 % today (Löfstedt, 2012). The outcome of raising the two variables would be a real estate tax rate equivalent to 8 öre/kWh for hydropower and compared with other energy sources as wind 0.5 öre/kWh and nuclear 5.5 öre/kWh. To take number into a context and what a manager of hydropower expressed in Löfstedt's (2012) article the amount tax per kWh is more than the firm invest for future to remain their capacity or compare with latest summer in 2012 when price for electricity was below 8 öre/kWh. The outcome would be that future investments might be postponed or cancelled at this tax rate according to the manager. According to Söderberg (2010) had small-scale hydropower lower real estate tax compare to large-scale hydropower due to lower returns before 2007. In 2013 will thirteen percent of the revenues go to real estate tax for small-scale hydropower without certificates Söderberg (2010) and Respondent12 (2012) claim even 20 %. Increased real estate tax was considered as a factor that will affect the hydropower industry (Respondent9, 2012; Respondent10, 2012; Respondent12, 2012; Respondent20, 2012; Respondent6, 2012).

4.3.3 Increased presence of intermittent energy sources

Today there is an increase in installed power in intermittent energy sources as wind power in Sweden. It is still considered small compare to other energy sources, but new wind power is built and in 2011 the electricity production was 6.1 TWh, an increase with 74 % from previous year. The Swedish government has set a target for 2020 of having a production of 30 TWh from wind power (Energimyndigheten, 2011). The growth rate has been ten percent annually recent years but the increase has been even higher during the last year. Swedish Energy claims that with more wind power production an increased dependence in different energy sources, as hydropower will be

³ fauna way - is a type of ladder where also smaller organisms than fish can move upstream

necessary (Svensk Energi , 2012). The respondents are also aware of the situation that increased intermittent sources would affect the hydropower market (Respondent1, 2012; Respondent2, 2012; Respondent8, 2012; Respondent4, 2012; Respondent6, 2012; Respondent5, 2012). Electricity cannot be stored and production must be equal to consumption and hydropower act as a balancing source. The presence of more wind power will need more coordination in shorter time slots, from hours up to days for electricity production planning and it is said that hydropower will have a decisive role in future (Dahlbäck, 2010). The introduction of wind power will affect the controlling need in the power system weekly. Weather predictions are hard to predict weeks ahead and there may exist weeks with a lot of wind and other weeks with less. Then, theoretically would it exist a need at its extreme equivalent to the wind production in times with no wind. Shorter predictions has also uncertainties because of the difficulties to predict hourly, it is hard to know when it will start to blow and calculations show that 30-40 % of the installed windpower capacity need to be controlled at an hourly basis (Dahlbäck, 2010). The figure 17 shows how quickly hydropower can be adjusted regarding output and with time compare with a heat powered plant.

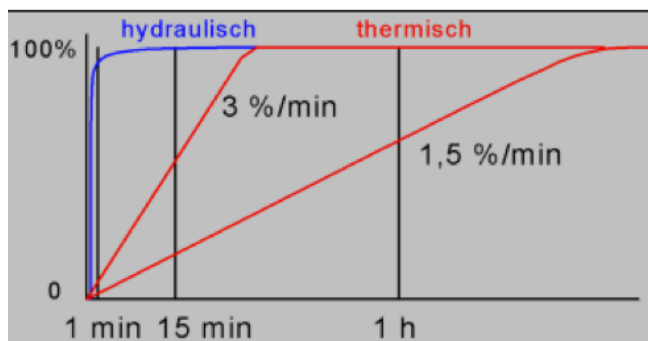


Figure 17 - Regulating capacity of hydropower comparing to heat powered sources (Dahlbäck, 2011)

The growing need of balancing the grid also means an increased frequency of start and stop for hydropower plants. Respondents expressed an uncertainty related to this new way of running the hydropower plant since they were not constructed to perform this when they were designed (Respondent20, 2012; Respondent6, 2012). There is an opinion that wear will increase for the moving parts and it is not clear what actually happen with hydropower plants that are started and stopped in just a couple of seconds (Respondent5, 2012). There can be a business opportunity to sell balancing power but it may develop additional costs, such as extra maintenance cost. It would need hydropower plants designed to handle start and stop efficiently (Respondent4, 2012) and this could be done with hydropower plants with more turbines, which would make it easier to regulate (Respondent20, 2012). Increased intermittent sources also enable alternative types of hydropower to be developed and one of these is pump storage plants. Pump storage plant is working as a traditional hydropower plant but with two magazines to store water. In times were there is an over-supply of electricity production water can be pumped to a higher-level storage and to be saved for future need and the storage acts as a battery. When production is less than demand, water can be released and the pump-storage plant will work as a hydropower plant. The

respondents are not fully enthusiastic about the technology and the answer is that it is not economical feasible today with these prices (Respondent3, 2012).

4.3.4 Dam safety

When most of the dams were constructed, in 1950-1960, they were dimensioned according to then present legislation and guidelines. Based on new knowledge and experience the legislation and guidelines have been changed. According to the legislation the owner of the dam must have orderly supervisions. They are also responsible to maintain the condition of the dam and ensure that it does not create any damages on external interests due to changes in water condition. (Kuhlin, 2012)

Since 1997 the producers of hydropower have agreed to follow RIDAS, which is guidelines for dam safety, which was created by the industry to ensure the quality of dams and reduce risks for damages. RIDAS classify dams into different classes of safety depending on the consequences of breakage. The highest class 1A is followed by 1B, 2 and 3 where the consequences ranging from obvious risk of human life to negligible risk of damage on property. Different dams within the same facility can have different classification and depending on the classification different dam safety requirements proposed to fulfil. (Kuhlin, 2012)

4.3.5 Investments in dam safety

According to Respondent8 (2012) the work with dam safety is something producers have been working with for a long time and will continue to do. The guidelines that have been developed will be updated and together with new ways of calculating river flow deriving from precipitation will create the foundation for which investments that are prioritized. Respondent5 (2012) sees dam safety as an area for future investments and something that will be critical to future risks and safety.

The producers have different strategies regarding consultancy services when it comes to dam safety. According to Respondent13 (2012) their company is trying to in-source as much of the competence as possible since the area of dam safety is critical to the company's overall risk management and the consequences of breakage would be tremendous for the firm. However, due to internal working load consultancy services are used. The focuses of investments are restoration of dams according with present legislation and current flow calculations. According to Respondent6 (2012) the new flow calculation and precipitation knowledge initiate investments in present gates and its capacity to handle the new flow. The collected view of dam safety is that is critical for risk assessment for the producers and is something that historically has been and in future will be an area of large investments, which is confirmed by Respondent8 (2012) and Respondent10 (2012). Respondent11 (2012) also confirms the view but is questioning the RIDAS recommendation when it comes to small-scale hydropower. Even if the plant is counted as small-scale it can assess dams within the higher classification and consultants working according to recommendations stated by RIDAS and do not want to discuss alternative solutions that could be more cost efficient. This

makes it expensive for an actor with small-scale hydropower and dams with high classification. Respondent11 (2012) requests a harmonisation of RIDAS according to small-scale hydropower.

4.4 Horizon when investing

Investments in hydropower plants are made on a long-term basis, usually between 40-50 years. Some of the investments, such as equipment for controlling, have a shorter investment horizon due to a more rapid change in these areas. However large investments, in e.g. turbines and generators, the horizon is as long as earlier mentioned. Investments in control equipment are also made to improve the reliability for the hydropower plant. (Respondent6, 2012)

According to Respondent10 (2012) their company is stringent working with a continuous reinvesting program including three to four plants per year to maintain the average age on the plants in the portfolio, which is something that they have been doing for the last twenty years. Respondent4 (2012) highlight that when reinvesting in the plant a higher efficiency is often reached but that it is not increased efficiency but extended lifetime of the plant that is the main purpose of reinvestment.

The reason why large reinvestment program has been executed the last years is according to Respondent17 (2012) due to a slack in reinvestments during the eighties and nineties and this is something that needs to be recovered now. However, due to this slack, a lot of the competence that existed in Sweden in 1960-1970 disappeared since the companies did not request them and that is one reason for why they are rare now (Respondent11, 2012). Respondent4 (2012) confirm the issue regarding rare resources, especially with the competencies regarding mechanical equipment inside the plant, which according to Respondent13 (2012) is the major area of investment when reinvesting in hydropower.

The reliability is important for many of the hydropower plant. Traditionally the focus of research within hydropower has been on efficiency but since the efficiency is high for the parts that are in use, the reliability of the plant is of more interest, which also reflects the area of research (Respondent2, 2012). The view that it is focus on reliability in the projects today is confirmed by several actors within the industry (Respondent20, 2012; Respondent8, 2012) and is becoming more and more important since the requests for shorter production cycles is increasing.

4.5 Consultancy services in hydropower

Technical consultancy firms within hydropower today are rather undifferentiated. According to Respondent5 (2012) the major firms offer same services. Different firms appear at different times but the consultants remain the same, small firms get acquired and change name but it does not affect the choice of which consultant to work with. Respondent9 (2012) confirms the picture of the market and add that the main actors are large and few. The large ones offer a complete range of services and which of them that the customer purchase from is less relevant (Respondent13, 2012). According to

Respondent16 (2012) it can be some difference between the different companies depending on which one of them possesses the competencies for the moment but the similarities is predominant. Some of the companies have deeper knowledge in some of the issues and all the customers are aware of it. Respondent16 (2012) also highlight that it do exist small local firms that, if assessing the right competences, can be competitive.

4.5.1 Selection of consultant

When choosing whom the customer should purchase from they consider several factors. The price is the most important factor and even though competence is critical it is not possible to disregard the price. In best case the competent consultant also offers a competitive price. (Respondent11, 2012) Another important factor when choosing consultants are references. The customer wants to ensure that the consultant has experience from similar projects to minimise the risk in specific projects. (Respondent6, 2012) Since the potential implication of when something does not go according to plan it is critical to ensure that the consultant has earlier experience from similar tasks (Respondent7, 2012). When requesting references it is references on hydropower project and not on general projects that is of importance (Respondent16, 2012). It can be difficult to do detailed description of the assignment the consultant should perform and due to this the choice of whom to work with can be affected by if the consultant has made earlier projects with the customer since they then can simplify the descriptions and the consultant will understand anyway (Respondent17, 2012). The consultant's ability to communicate the work procedure and performance continuously and be able to contribute to a projects procedure is requested since the customer want to be kept informed during the process and not just after in a report (Respondent6, 2012). The customer request quality from the work performed. However the criteria for evaluation of quality is subjective and is likely reflected back on factors such as references and competencies which the consultant can ensure quality through. (Respondent5, 2012) The customer want to feel that they can rely on the consultant and that the work is accurately performed which make the factor of trust important (Respondent9, 2012). According to Respondent13 (2012) is one of the reasons why customers purchase consultancy services is to take advantage of the fact that the consultants are working with other companies in the industry as well and because of that can use the best possible solution to problems instead of unique customer solution. In figure 18 a summary of the different buying criteria is presented.

Factors

Price

References

Consultant has earlier experience

Consultant worked with customer before

Continuously communication

Quality

Trust

Best possible solution

Figure 18 - Summary of key buying criteria

4.5.2 Purchasing of consultancy services

Most of the customers are working with several technical consultancy firms. The reason for this is that consultancy firms have different areas of expertise as well as the customer do not want to be dependent on one actor since that could increase the prices and risks. The customers are creating a mixture of companies to ensure a complete delivery since none of the consultancy companies are providing a complete portfolio (Respondent10, 2012). For continuous purchase customers are using general agreements with the consultancy firms where price and competences are stated. (Respondent4, 2012). Since the competence of the consultant is more important than the specific consultancy firms the customers investigate where key persons are working and then ensure that they have a general agreement with that specific firm. The industry is relatively small so the customers have in general good knowledge regarding which consultant that has competencies in respectively area and the consultancy firm is chosen based on where these consultants are working. (Respondent5, 2012) Even though the formal procurement often are performed centrally the person at the customer that later is going to use the service have the possibility to affect which consultancy firms they should have a general agreement with. However, for most of the customers, the phenomenon with centrally purchasing units is relatively new and something that can affect the criteria of purchasing in future that will make it more difficult to choose specific persons. If the user cannot motivate why the unique person is demanded and the purchasing department ensure similar services with other consultancy firms the user might need to accept the by purchasing unit chosen firm (Respondent17, 2012). When the customers are initiating larger projects on their plants a request is sent out to the consultancy firms with details of the specific projects and the general agreement is overlooked to ensure the best purchase for the unique project (Respondent4, 2012). This is something that is confirmed by Respondent9 (2012) who also add that during these projects it is not rare that consultancy firms temporary hire

other consultancy firm as sub-consultants in order to cover peak in demand or lack of competencies in certain projects. The industry is facing a change of generation in the next coming years and it is already now a problem that the customers are so focused to hire senior consultants since the transfer of knowledge to junior consultants gets limited and will affect the knowledge they will access in the future (Respondent7, 2012). The change in generation will, as in many other industries, be a challenge in the future and it is something that the industry is processing (Respondent8, 2012).

According to Respondent10 (2012) it could be possible for some areas within the hydropower, e.g. permit applications and construction, to be generalized across other industries of consultancy services and in that way achieve economic of scale on these services meanwhile some areas, e.g. turbine and generator, is unique for hydropower. If this opportunity was exploited and successfully implemented it would affect the pricing of services in hydropower positively from a customer perspective.

4.5.3 Small-scale hydropower

Small-scale hydropower produces significant less electricity than large-scale plants do and because of this they also have another budget for investments. According to Respondent20 (2012) it is important that the consultants have experience and references from projects on similar size of plants as the customers possess. If the consultant is used to large-scale hydropower that have the possibility to cover more consultancy hours they transfer that concept to small-scale hydropower with the result of too many hours and high costs. The consultant must be able to discuss alternative solutions that those applied in large-scale hydropower, for instance regarding classifications of dams. Respondent17 (2012) takes reports, that often is the delivery to the customer, as an example. The consultant must be able to determine wheather the customer is expecting a long extensive report with all aspect analysed or if it is the short slim version that deliver the result. It is important in terms of amount of hours that is spend on each project. Respondent20 (2012) also argue that it is more important that the consultant they hire match with personal chemistry than having really long experience in field as well as understand both the production and environmental interest of the plant.

5. Analysis Market

In this chapter new and existing needs are identified and analysed according to the theoretical framework presented in earlier chapter.

5.1 Introduction

From the empirical findings it is possible to, based on frequency of customers' answers, identify three new customer needs and two existing customer needs. The three new needs are: Solutions for small-scale hydropower, Adaption to changes in legislation as well as Power regulation. The two existing needs identified are Risk minimization and Cost. Further in this chapter each customer need will be analysed based on presented framework in earlier chapter.

5.2 Small-scale hydropower

The small-scale hydropower has during the last couples of years been facing low profitability. The main problem is that they are facing more or less the same requirements regarding taxes and environment as the large-scale hydropower but with significant less production to distribute the cost for these activities on.

The low profitability does not make small-scale hydropower especially attractive from a technical consultant perspective. However, due to the amount of small-scale plants that exist in Sweden today, 1600 of different sizes, the market should not be ignored. Producers of small-scale hydropower have traditionally had a demand for technology consultancy services within their business but since it will change due to above-mentioned arguments in the coming years it will be handled as a new need according to the theoretical framework in this thesis.

5.2.1 Description of need

Producers within small-scale hydropower have to ensure that when they are using technical consultants they should have experience of small-scale hydropower to understand the challenges the producers are facing and be able to have a more holistic view of the plant and operations compared to when working with large-scale hydropower. It is also important that the consultant provide solutions with a reasonable cost/benefit relationship. This could be difficult for the consultant in some of the cases, e.g. dam safety where they are obliged to use the RIDAS standard. The consultant must be able to use solutions and report to a level that is reasonable for the small-scale plants. Small-scale hydropower has, as earlier mentioned, often the same requirements regarding regulation as large-scale but not same revenue which create a need for cost-rational solutions.

5.2.2 Trends

To be able to understand what is going to affect small-scale hydropower it is important to investigate driving forces and trends within the market. It is today high political

uncertainties for hydropower in general which also affect small-scale hydropower. The “Kommittedirektivet” can affect in ways that force the industry to engage in major reinvestment programs to update current plants to new regulations regarding the use of best available technology. Since many small-scale plants today are facing low profitability it is questioned whether producers would engage in these investments or close the plant. For now, until the investigation is completed and the consequence unveils, it will most likely withhold investments. “Vattendirektivet” is another political factor affecting. “Vattendirektivet” affect hydropower plants in terms of regulation regarding the local environment around the plants. The uncertainty regarding future production in plants and investments required to get permission to produce inhibit investments short-term but could, if producers decide to keep small-scale plants, increase investments, probably with focused on the plants environmental effect on the local society, in a long-term perspective.

Seen from an economical perspective small-scale hydropower will face a challenge when certificates for renewable electricity production ends, which for most of the plants was in the end of 2012. The certificates have compensated small-scale production for several years and when it now has disappeared combined with low prices on electricity it will be even harder to achieve profitability in small-scale hydropower. Another factor to consider on the economic level is increased real estate taxes. The taxes is reflected upon the amount of electricity produced and will affect small- as well as large-scale hydropower plants. This will leave less room for investments and profitability for small-scale hydropower and challenge producers to seek ways to reduce costs.

Hydropower as source of electricity is, compared to other alternatives, seen as environmental friendly from a national perspective. However, due to changes in the watercourse it does effect the environment locally. This is something that can affect small-scale hydropower in terms of authorization of production due to social opinion in the local society and by that the long-term perspective on the plant. The long-term perspective is important when deciding which investments to engage in and the economic benefits they can provide. If producers have identified uncertainties for certain plants it can affect their willingness to invest. Since it is more expensive to produce electricity with small- than large-scale hydropower due to lack of economic of scale factors it is reasonable to assume that it would be easier to achieve profitability in small-scale hydropower plants if the owner is a small focused actors that have small-scale hydropower as its main source of electricity production compared to the large actors where the small-scale only count for a few percent. These large firms have higher over-head costs and profitability requirements and are used to work in a way that is not applicable on small plants.

5.2.3 Attractiveness

Market Size

The market size for providing technical consultancy services to small-scale hydropower depends on which parameter that is used to define market size, amount of plants or consultancy hours per plant. The market is characterized with many plants, which count for a small share of the total electricity production. The large amount of plants make it difficult to get an overview of what every plant is requesting and since the amount of consultancy hours is low on each plant it demand a rational way of handling offerings and distribution of work. However, the large amount of plants have to be seen as an opportunity when it comes to customer need. By having the right way of working economies of scale can be reached and by this be able to offer attractive services.

Market Growth

The market growth is dependent of the political uncertainties mentioned earlier. Depending on the outcome of these uncertainties the growth can shift. If the changes for the plants are reasonable seen from a producer's perspective and they decide to do the changes instead of closing the plant market for services to small-scale hydropower can increase significantly. However, if the different changes in legislation will be unreasonable or that no changes need to be made the growth will not be remarkable but still an attractive market with the right service.

Profitability

Customer: The customer within small-scale hydropower will demand cost-efficient solution adapted for them performed by consultants having an overall picture of the plant understanding the producer's situation and is able to provide solutions that are rational in terms of price and delivery. The bargaining power of customer is as highest when several suppliers are offering the same product. However, by being first in adapting cost-rational service offerings ÅFHP can achieve a lead-user advantage for at least a time. It is always a risk that the customer is choosing to in-source the service but in this case it is highly unlikely since the strategy requires large amount of plants to achieve economical of scale, which only a few customers possess and in that case need to coordinate. Based on arguments presented above it can be concluded that bargaining power from customer is **low**.

Rivalry: Services that small-scale hydropower are requesting is in its content in many ways the same as for large-scale hydropower which means that the same actors that is present at large-scale hydropower market also work with customers with small-scale hydropower. However, by working in the right way including high grade of economy of scale, re-use of earlier projects and other similar cost-rational solutions it could be possible to keep a low cost-structure with increased value and in that way be able to have an advantage in the market. However, it is a strategy that is rather easy to imitate

for existing competitors and by that outplay the advantage. The threat of rivalry is therefore **medium**.

New entrants: Since the strategy of providing cost-rational solutions based on high grade of economic of scale, re-use and earlier experience it can be difficult for a new actor to enter the marketplace if the invested capital is limited. Another factor to consider is the competences. A new actor could enter the market but then have to recruit most of the consultants from the existing actors with a better offer that they can provide which could be difficult. The threat of new entrants could be concluded as **low**.

Substitute: Since small-scale hydropower actors are requesting services it is difficult to replace it with substitute. The only substitute to purchasing consultancy service is to in-source the service within the company which could happen to a certain degree but as described earlier it would request an internal economic of scale which only a few customers are capable of. Due to this, the threat of substitute has to be considered as **low**.

5.2.4 Summary/Conclusion Small Scale Hydropower

Trends: The political and economic uncertainties are major for small-scale hydropower. Reduced income when certificates end in combination of several potential forced investments referring to the investigations “Kommittédirektivet” and “Vattendirektivet” together with increased real estate costs affect all the potential profitability for small-scale plants. The small-scale hydropower also face a challenge referring to the social opinion and the effect on local environment, which can affect the permissions of produce.

Attractiveness: Based on above analysis it is possible to conclude that the profitability within the market for supplying cost-rational services to small-scale hydropower could be an attractive market. However, it is important to realise that it will request a complete new way of working with e.g. high grade of re-use and economic of scale to be able to provide rational solutions to the customers. If engaging in this successfully the market is large and can be profitable. It is also worth mention that it could be useful to ensure a lock-in effect for the customers to decrease the risk of rivalry.

5.3 Change in legislation

During the last years and also in future the legislation that, direct or indirect, affect the hydropower industry has and will be changed. The industry have been using legislation stated a long time ago when for instance knowledge of the effect hydropower has on local environment was not as good as it is today. Therefore, to handle these changes the producers need to engage in certain investments that, from a consultancy perspective, can imply a growth factor based on new needs from customers.

5.3.1 Description of need

As it is today, two major investigations that can and most likely will affect the hydropower industry, “Kommittedirektivet” and “Vattendirektivet”, are during process and depending on how the result of these will be the demand for consultancy service can be affected. Since the investigations are during process it is no one that know what they will result in and because of this the uncertainty of which consultancy services that will be demanded is high. However, since the investigations focus on two major areas it is reasonable to believe that the investment will be in these areas. “Kommittedirektivet” is mainly focused on updating the legislation that the hydropower industry is using. The effect on this is updated legislation with increased focus on the environmental effect of production. One of the changes that could be the result of this is the classification of hydropower as business harmful to the environment, which then means that best available technique should be used and that it is the polluter who should pay for environmental damages. The second investigation, “Vattendirektivet”, aims to increase the cooperation between countries and by that handle issues regarding biological environment. HaV noted in their report from November 2012 that the hydropower industry need to be more ecological adapted if Sweden should fulfil the criteria stated in the EU-directive. What this means for the producers today is uncertain but it will probably increase the investments within areas of mapping and reducing ecological footprint from hydropower production.

5.3.2 Trends

The trends within this area are as earlier mentioned that major changes can occur due to change in legislation. The industry and its stakeholders can agree upon that it will have effect, however, the effects are still uncertain. From a political perspective the hydropower is critical for electricity supply within the country and it is one of the best alternatives in large-scale production in terms of emissions. The combination of its importance with its low emission hydropower industry can be confident that it from a political way will ensure that it remain, even if adaptation to new legislation will be necessary. Regarding the economic factor many of the now existing hydropower plants are due to its age repaid and, except some of the small-scale, profitable. This is also one of the main arguments from stakeholders within the industry who want the hydropower producers to take a greater responsibility regarding the environmental effects. The social opinion regarding hydropower, as a source of electricity production, is still that it is one of the best alternatives and that it is important for Sweden as country. The environmental effects are something that have received attention the last years and is something that will affect how producers need to act.

Since investments in hydropower are made very long-term it takes long time before new technology has been installed and used. However, the industry invests heavily in research and development and continuously improvements are made. The hydropower is considered to be renewable, however, historically effects on the local society and environment have not been the area of focus when it comes to how environmentally

friendly the hydropower is. The current investigations are one factor intending increased environmental consideration for the industry.

The legislation is, as earlier mentioned, under investigation from several directions and is something that will affect the hydropower industry. The uncertainty in these decisions is large and it is difficult to predict how they will affect the investment and demand for technology consultants. It is important for all actors within the industry to keep up with the news regarding these investigations and ensure close fit between demand and offering.

5.3.3 Attractiveness

Market Size

The change in regulation can lead to a massive reinvestment in hydropower plant that in turn generates new opportunities for technical consultants. Since many of the plants are resting on old water permits a review of these will create a large demand for investments to update the plants according to new permits. Due to that the plants are as profitable as they are it is highly unlikely that they will not engage in the investment of economic reasons. The market is however uncertain and dependent on the outcome of the changes in regulation. What can be identified so far in the process is that it involves a large amount of plants and it can take several years before the investment is made. However, if one of the consultancy firms has the possibility to get a leading role in the change they will have projects for a long time onwards.

Market Growth

The growth of the market is solely dependent of the result of the investigations and how they will affect the legislation for hydropower. If major changes in legislation are made the demand for consultancy service will grow quickly. However, it is likely that the producers achieve some time for the adaptation, which will spread the investments over several years. The services that will be requested is for the industry not new but the legislation can change the direction of investment for the industry which can have large impacts for market growth in some of the areas.

Profitability

Customer: The bargaining power from customer is always a threat to the profitability. The changes in regulation will create new business opportunity and will demand most of the producers to engage in investments to meet the new regulations. Depending on the outcome of the investigation in terms of time-period the producers have to fulfil the regulation the demand for technology consultants could peak, which in turn creates a deficit of consultants which result in low threat of bargaining power from customers. However, some of the customers have a large amount of plants and these will be attractive from a consultancy perspective due to large amount of investments. Based on above arguments the bargaining power of customers is **medium**.

Rivalry: The competitors that compete about the investments that the producers need to engage in are the same as the hydropower market today. The competitors are few but strong and consolidated. It will probably not be any unique services that will be requested compared to the market today, possible an increase in the amount. It can be a risk that some of the competitors try to position themselves with a low cost profile that could affect the profitability at least in the short-term but it is, based on how the industry looks like today with few large companies, not likely. However, the competition is always a threat and based on the intense competition in the industry the threat should be regarded as **high**.

New Entrants: The change in legislation will, as earlier mentioned, create a demand for consultancy services. However, it is not likely that it will create an opportunity for new entrants into the market due to that it will be the same competencies as already existing combined with experience and references from similar projects. Based on this threat of new entrants are **low**.

Substitute: The possibility for substitute for this demand is as for other services very few. One that is possible is the in-sourcing alternative that could be an option for some of the need, especially for the large firms, but it will also demand resources and coordination from the producers, which can be scare. The threat of substitute can therefore be considered to be **low**.

5.3.4 Summary/Conclusion Change in legislation

Trends: To conclude the trends within change in legislation for hydropower it is obvious that the industry is facing a great deal of uncertainty when it comes to how it will be affected by these new investigations that are under process right now. However, by being a active partner in these changes and keep up with the latest news regarding the investigations and how it will affect the legislation and the industry it is possible to be an agile consultant that transforms to match the demand from customers.

Attractiveness: What can be said regarding the market size and growth for this need is that the uncertainties are high and it will be dependent on the outcome of the investigations performed. The profitability of these services will most likely reflect the one current today where the most critical is the intense competition.

5.4 Power regulation

The amount of intermittent sources of electricity production have been growing quickly the last years. The majority of these sources are dependent on the current weather condition, which makes them unpredictable in terms of amount of electricity produced. Hydropower is, at present moment, the only large-scale technique to store electricity production and produce after demand in Sweden. This makes hydropower attractive from a balancing source perspective and creates new way of value creation for the producers. Intermittent sources produce only when the condition for them is the right,

which mean that the time for when the regulating power need to set in can be very short.

5.4.1 Description of need

The demand for power regulation did not exist when most of the hydropower plants were constructed and due to that they are not made to handle the short cycles that can be necessary if using it as power regulation. The industry feels certain that the power regulation will increase. What they are uncertain about is how it should be compensated and the cost for providing it. If it should be attractive from a producer perspective it have to be more profitable than produce as usual which means that the producers need to know how much it cost, direct and indirect, to use respectively plant as regulating power which for now is very uncertain. The customer need from this transformation will be in maintenance of the plant since the wear will increase with more start and stops. The customer also wants to understand how it affects the plant and its profitability if using it as regulating power.

5.4.2 Trends

From a political perspective the goal for renewable electricity production will remain if not increase. This will increase the demand for regulation power since most of the renewable sources are dependent on external conditions such as weather. The increased demand for regulating power will create opportunities for the producers. The one responsible for the balance of the demand and supply of electricity must ensure that it exist regulating power when the intermittent sources increase. How the compensation model will be constructed is not clear for now but it can for instance mean that the responsible for balance need to purchase stand-by power which can be an alternative source of income for the producers.

The technology develops continually and one threat for hydropower as regulating power can be smart grids. Smart grids contains several things regarding controlling of the electricity net and for regulating power large batteries that store the electricity produced when the supply is larger than the demand to a time when the demand is larger than the supply. However, this is still new technology and it will take several years before it is possible to use in large-scale.

5.4.3 Attractiveness

Market size

The market size for technology consultancy services relating to increase demand of power regulation in hydropower is small. The producers use their present equipment to meet the demand and when upgrading the plant they ensure that the technique can handle increased regulation. The uncertainties regarding cost and compensation is not something that technology consultants will be involved in and since the maintenance of the plants usually is made of in-house employees it will not create any demand for technology consultancy services.

Market growth

It is earlier established that the demand for regulating power will increase in line with the increase of intermittent sources of electricity. However, since this will not create a demand for technology consultants the growth of these services is small if at all existing. If it will be any growth it will be among the already existing demand and competencies.

Profitability

Customers: The customer will take the largest part in this change. The increase in services demanded for the plant will most likely stay in-house at customer and if they chose to hire any external resources they will use the general agreements if not requesting specific resource. Therefore, the threat of customer is **high**.

Rivalry: The rivalry is constantly high in this industry. If the customers will request services regarding regulating power they will chose consultant firm on the same criteria as for other services which means that it will be important to have the right competencies, references and price. The threat of rivalry has to be considering being **high**.

New Entrants: If the increase of regulating power will create any demand for technology consultants it will be similar to the ones providing today. This means, from a new entrants perspective that it will be difficult to enter the market due to the difficulties to attract resources and of the competition. Due to this, the threat of new entrants can be considered **low**.

Substitutes: As earlier mentioned it is difficult to find substitutes for services of this kind. It can be possible that the producers of the turbines and other mechanical parts take a part of what other should be considered technology consultancy services. Otherwise this threat has to be considering being **low**.

5.4.4 Summary/Conclusion Power regulation

Trends: The market for regulating power will remain and most likely increase. This increase will create opportunities for producers since it at current state does not exist any alternatives to hydropower as regulating power.

Attractiveness: To conclude the attractiveness of the customer need arising when the demand for regulating power increases it is most critical to understand that with present state it is not possible to interpret the consequences for technology consultants. As it looks now, the customer can handle the upcoming need by themselves in cooperation with their customer regarding compensation model. It can generate some services for consultants but will most likely go to ones having general agreements with unique customer.

Based on the above analysis on this need where it is stated that it at current state is possible to identify any market for technology consultants if the regulating by hydropower increase this thesis will not handle this need further in the analysis.

5.5 Risk minimization

Investments within the hydropower industry are made on long-term basis. The horizon when investing is usually between 40-50 years depending on the company. It is large investments seen from an economic perspective and the customers have to ensure that the quality and sustainability of all projects is at high level of performance.

The plants that are producing electricity are handling large amount of water. If something should happened the consequences could be catastrophically, both for the environment and the company owning it. The producers are regulated in the way they have to work to ensure that the plants they have fulfil present legislation but they also have responsibility for consequences if something happens. Because of the consequences if something would happen to the plants the customers are strict when choosing whom to work with. The customer needs to ensure that the consultants that they hire are experienced and have made similar project before. They seek proof of experience where consultants can show that they have performed similar services as requested from the customer.

5.5.1 Analysis of existing need

As mention above the criteria the customer is requesting is proof of experience. To be able to meet these demands it is important to understand how the customers are measuring proof of experience. As mentioned in the empirical context the customers have key buying criteria and the following is referring to the need of risk minimization:

- References
- Quality
- Consultant has earlier experience
- Consultant has worked with the customer before
- Continuously communication
- Trust

To understand how consultants should meet this need it is important to understand what key factors of success (KSF) respectively key buying criteria (KBC) correspond to as well as understand which one of them that is affected by the need of minimizing the risk from a customer's perspective. Following, the risk affecting buying criteria is analysed and key success factor, what the consultant need to do to meet the purchasing criteria, is identified.

References and quality: The customers are requesting references. Some of the customers want to ensure that the consultants have made large projects earlier while some of them want to ensure that they have made projects reflecting the one it is regarding at the moment. It is also a way for the customers to ensure quality of the work

which is for them one of the most important KBC to ensure risk minimization. To meet this KBC it is important to possess the references requested as well as highlight what in the project that went well and what could be improved to next time.

Consultant has earlier experience and worked with customer before: The customer wants to see that the consultant that should work on their plant has earlier experience from similar task. They often seek senior consultants to perform the work or that a junior or consultant does it and the senior consultant revise it. This is a way for the customers to reduce the risk of trial-and-error syndrome as well and ensure they are competent consultants. The customers also appreciate if the consultant has worked with them before because it then makes it easier to discuss the task or project in a more informal way. For the consultancy firm it is important to meet this demand by ensuring that the consultants have experience and that it is claim through updated CVs. It is also important to possess senior consultant in the areas that are most critical from a risk perspective of the customer as well as assessing consultants and junior consultants in these areas that could use the senior consultant as approver and by the time become senior.

Continuously communication and trust: It is important for the customers when hiring consultants to receive continuous feedback and reports of how the projects proceed. Due to the risk minimization need they have to trust the consultant and one way of reduce the risk of miscommunication of tasks and direction of project are to ensure a continuous communication which will make the customers to trust the consultant and the procedure of the project. From a consultancy perspective it is important to ensure that the customers are informed of present state and what decisions that have been made and how they affect the overall direction of the project. The consultants need to have the ability to ensure that the customer does not feel that the project or assignments not fulfil the stated purpose.

5.6 Cost

The customers hire technical consultants because they can add value to the firm. The consultant mainly adds value by using its competence to resolve part of customers project. However, the customers' need to ensure that their business become and stay profitable and because of this they establish key buying criteria referring to the cost of hiring consultants.

5.6.1 Analysis of existing need

From the empirical context the following key buying criteria referring to the existing need were identified:

- Best Possible solution
- Price

To understand how the consultants should be able to meet these criteria's they are analysed in terms of key success factors:

Best Possible Solution: One reason for why customers hire consultants is to gain access to information regarding solutions from other companies in industry. Consultants that have made similar project for another client can bring information about that project regarding solutions and problems into the new project and in that way ensure a better and more cost efficient process. It is also a way for the customers to ensure they do not have their own solutions and instead using what for the moment is considered best in the market. For the consultant it is important to realise that this is one of the reasons why the customer is hiring consultants and be proactive in the role of identifying which similar projects the consultancy firm have made and the key learning from them. It is also important to be updated on what is considered best practise for current area, which can be ensured by for instance be active on conferences arranged by trade organisations. To ensure the best possible solution regarding cost the consultants have to work in an efficient way with high grade of re-use and standardised solution where it is possible.

Price: The price is one of the most important key buying criteria for evaluation of consultants that the customers are mentioning. For larger projects the customer often sends out a request to consultancy firms that return an offer based on specification in the request. For continuous purchasing general agreements are used where hourly rates for each competencies are stated.

One of the main problems with evaluating cost of consultants with hourly rates of competencies is that the cost is dependent both on hourly rates and amount of hours. Due to this it is possible to keep low hourly prices and instead increase the hours and it that way compensate the low prices. From a customer perspective this become problematic since the total cost increase compared to a consultant that would have used less hours. However, since most of the customers are private owned and not regulated by the public procurement act they can ignore an offer if they believe it is too optimistic and that it is a risk of increased costs if choosing it.

5.6.2 Cost as growth factor

The need regarding cost is described as an important area for the customers. However, the including buying criteria of best possible solution is not affecting which consultant to choose, it is the reason for why the customer is using consultant at all. The customer is evaluating the need of cost only on the criteria of hourly prices of services, which create an error in the evaluating process of ensuring lowest total cost. To measure cost only with price is something that is common in the consultancy industry and the researchers believe it is difficult and even naive to believe it is possible to change the customers' perception of it. ÅFHP can compete with low hourly prices but when having a strategy, as ÅFHP has, to grow it will not be suitably to compete with price. The reason for this is that it is more difficult to attract financial capital to cover the expansion of growth if the profitability is low as well as it becomes more difficult to attract and keep

consultants when the prices are in focus. Based on this argument the need of cost is important from a consultancy firm's perspective but not something that can be considered to be a growth factor and the need will not be further analysed in the thesis.

6. Empirical Findings ÅFHP

This chapter will present ÅFHP from an internal perspective describing ÅFHP's different resources and capabilities. The data is primary gathered from ÅF employees, ranging from managers to junior consultants, using semi-structured interviews and a questionnaire.

6.1 Service offering

ÅFHP is a relatively new actor in the hydropower market. Today they offer a complete number of services for the entire life cycle of the plant, from the feasibility phase to project development to implementation and finally operations and management. This is primary done to hydropower plants owners as utility firms, but also studies and analyses for other customers as investors, authorities and manufacturers are performed.

6.2 Organisational structure

The ÅF corporate group consists of four divisions; international, industry, infrastructure and technology. The divisions are divided into business units and these are further divided into market areas. The market area hydropower belongs to the Industry division and business unit energy. The market area hydropower is divided into geographically regions with offices in Malmö, Stockholm, Luleå and Sundsvall. According to one consultant it can be seen as a strength to have this geographical spread since it facilitates a better relationship to the local customers.

A comment from an employee was that ÅFHP is a bit weaker in northern part of Sweden where most of the large-scale hydropower is. In addition there is also a hydropower subsidiary in Switzerland with an international focus of hydropower. They offer services worldwide and have a good reputation within the industry.

The organization is relatively flat with one manager responsible for each office, but also responsible of sales to existing and new customers. The working environment at ÅFHP is characterized as organization where employees are given freedom and responsibility for their specific task. Further capabilities for the organisation are flexibility, ÅFHP let the market direction decide how to organise and if it is necessary changes in the organisation will be done. The flexibility to adapt to a changing market is seen as strength of ÅFHP. This market awareness is also noticeable in top management who in the most recent organizational change has gathered energy divisions in a larger entity defined as energy whereas other divisions are inserted in a geographical categorization.

The ÅF vision, “One-ÅF”, is a corporate strategy at ÅF, which focus on operations under one brand and part of it is to encourage cooperation across divisions to leverage the resources and competencies in similar industries and divisions. Part of this has been done to increase the awareness of skills and know-how towards customers since part of the marketing is set to share the vision of “One-ÅF” and not by treating individual

divisions. The procedure of working in this way is to encourage and facilitate for employees to work with different types of projects and interest. It furthermore helps to share knowledge across projects and in different divisions, which hence create synergies for ÅF. Increased interaction with other divisions had helped to sell in new projects and decreased the dependency and vulnerability in low performing industries by growing to related industries where the knowledge is used as well. The outcome of vision "One-ÅF" is that a market area as Hydropower could benefit from resources from other parts of ÅF such as advanced equipment used in other divisions to be used in hydropower. In addition they can claim they have more competences when using consultants from other parts of ÅF, to become more attractive and to increase the service offering. How well this actually works is two-fold, employees claim that in practice there are administrative boundaries since divisions are treated as different firms and agreements have to be signed in-order to use the person and another employee says it is a vision but it is not a reality today that works efficiently.

6.3 The resources

The consultants can be divided into different categories depending on experience from junior consultant, consultant with some experience and senior consultants and they serve different purposes in the organisation. The different types of consultants differ in how hard they are to attract to the consultancy firm. Junior consultants are seemed easy to attract and are hired as fresh graduates from universities and they are easy to find since there is a good supply. Attracting and hiring consultants with some experience is harder since there are fewer consultants. Hiring senior consultants has initially been based strategically in order to get access to key customers as major plant owners and attract new customers. Senior consultants are few in the industry, and they are often known in the relatively small industry. Due to the importance of having a senior consultant they constitute as a key resource for a firm. Methods ÅFHP use to retain a consultant is done in different ways in perspective of the consultant's need. Different needs can be met e.g. by having interesting projects, offer a good working environment, or offer flexibility to choose which office to work within. There may be individual lists of preferences, but according to one respondent is the aspect of flexibility in work area and office which were the reasons why the consultant were willing to start working with ÅFHP. The questionnaire indicates that ÅFHP's performance to attract and retain different types of consultants is according to market level. An indication of above market level performance is in attracting junior consultants and also retaining senior consultants.

6.3.1 Intellectual resources – brand and reputation

ÅFHP is in a strong position since they can leverage on the ÅF's brand, long history and reputation. The recognition of the brand is also high among students it is considered as one of the most attractive employer and in a recent ranking ÅF was ranked at fifth place (ÅF, 2012). Explanations of this change in perception is said to be from the increased attention from the unconventional solution of combining sports with engineering. The

ÅF corporate group works hard to strengthen its brand in different sports events as being an Olympic green advisor or ÅF Offshore Race (former Gotland Runt). Sports champions, as Sanna Kallur, are also part of the brand management towards the public and to increase their awareness. Brand management towards industry is primarily done by participating in industry fairs, events and industry associations by letting consultants be the representatives of ÅF.

When asking the managers of what that had enabled ÅFHP to reach its position and success on the hydropower market is that customers see ÅFHP as something new and exciting in a mature and relatively conservative industry. ÅFHP has become associated of being a perceptive and comprehending consultant compare to other competitors, says one interviewee. This perception is also confirmed by the answers from the questionnaire. It shall not be neglected that ÅFHP is new and the respondents from the market interview did not mention ÅFHP among the first on their short list. Interviews can confirm this that ÅF is not usually related to hydropower but their position is improving and its brand gets stronger. The growth strategy by acquiring other firms have created opinions related to the brand and sometimes it can be perceived as sprawling and not consistent, as one employee expresses. The answers in the questionnaire confirm this picture since some answers are distributed below market level, but in summary the brand ÅFHP performed at market level and the ÅF corporate group brand perform well above market level. Being relatively unknown has also contributed to ÅFHP's growth and an explanation told is that competitors have not noticed ÅFHP's presence in some services asked by customers since ÅFHP has acted silently without gaining attention in the industry as an employee expresses.

The financial strength of ÅF corporate group has enabled ÅFHP to become a new provider of consulting services after the acquisition of Energo in 2010 and also an international expansion by the acquisition of Colenco Ltd. Energo had 300 employees and 25 consultants of them works within hydropower. Energo brought in important customers in hydropower as E.ON (ÅF, 2010). Colenco Ltd gave ÅFHP an extensive knowledge within different energy sources as hydro, thermal, nuclear and renewable and within environmental services. They also contributed to presence in emerging countries in south East Asia. This size and financial ability is seen as strength since ÅFHP can afford to invest for a long-term perspective and future acquisition targets says one employee.

The acquisitions have enabled a rapid growth and a critical mass of customer which customers now see ÅFHP as a new actor in the industry. A way of measure a firm's financial strength is to evaluate debt-to-equity ratio and after the latest large acquisition of Epsilon makes ÅF to the largest technical consultancy firm in the Nordics, ÅF has a debt-to-equity ratio of thirty percent and that is considered to be in the comfort-zone from an industry perspective (Linnala, 2012).

6.3.2 Knowledge resources

To be able to compete for larger projects using general agreement in the market the firm must have a list of consultants with different competencies and also experience within the industry to compete with the competitors. The larger consultancy firms are offering almost equal competences and services within hydropower. ÅFHP employees confirm the importance of having experienced people and the way to compete and differentiate is to have a list with outstanding CVs that is what gives access to the customers. A CV that shows good experience and competence can outweigh a mediocre proposal for a prospective project to a customer.

ÅFHP has only been in the industry for a short period of time and the acquisition of Energo enabled ÅF corporate group to enter the market, which laid the foundation to provide services with experienced people. The annual volume of projects has continued to increase and ÅFHP has gained recognition in the hydropower industry. A legacy from Energo is mentioned as an explanation, since Energo was not a complete provider of services within hydropower and specific focus into specific areas in hydropower and some knowledge areas can be considered as weaker and that may mirror the competence areas today and service offerings for ÅFHP.

The different competence areas can be divided into competencies relating to two categories; 1 and 2. The categories will be anonymised as category_1 and category_2 when evaluating ÅFHP to ensure confidentiality. ÅFHP is organized in one market area where competencies within 1 and 2 is in the same organization. This is deviating in comparison with one of the competitor, Competitor_1, which has these in two separate organizations. ÅFHP claim that having everything in one organisation is better due to shorter communication ways. It is also easier to offer full range of services and a complete package to customer. The firms differ in competence in the two categories where for instance Competitor_1 is strong in both areas., Competitor_2 is strong at the Category 1 side and Competitor_3 is strong in Category 2. ÅFHP considers them as less experience regarding Category_1 and strong in Category_2.

There are several competence areas where ÅFHP considers them as strong. The amount of knowledge within the competence_area_A is ÅFHP considered as one of the strongest technical consultancy firms in Sweden. The reason for this is the senior consultants within the area. This view is also consistent with the questionnaire, which shows competence level above market level. Services relating to competence_area_B are ÅFHP considered strong since they have senior consultants and that view is consistent with the questionnaire. These resources are of strategic value since they are hard to acquire when it comes to their specific knowledge area. Competencies within competence_area_CD are divided into two competence areas; competence_area_C and competence_area_D. ÅFHP considers them as strong in competence_area_C since the amount of consultants are high and the competence is spread into relating divisions it offers combinations of different skills and it provides a good composition. As one employee describes; ÅFHP reputation within competence_area_C is high from an

industry perspective, but competencies regarding competence_area_D is ÅFHP's position less experienced since ÅFHP lack competencies within the area. Competence within competence_area_E was considered as an area where ÅFHP has expert competence according to questionnaire. Competencies within competence_area_H does ÅFHP believe to be above market level and regarding competence_area_I and competence_area_J are they at market level. For competence_area_F and competence_area_G are ÅFHP considered as a bit weaker compared to other competencies according to the questionnaire and a summation is seen in the figure 19 below.

Competence area	Senior consultant	ÅFHP performance below/at/above market level
Competence_area_E		Above market level
Competence_area_CD		
• Competence_area_C	X	Above market level
• Competence_area_D		Below market level
Competence_area_H		Above market level
Competence_area_G		Below market level
Competence_area_A	X	Above market level
Competence_area_F		Below market level
Competence_area_B	X	Above market level
Competence_area_I		At market competence
Competence_area_J		At market competence

Figure 19 - Status of ÅFHP's competencies

Strategic important competencies within hydropower consultancy services are knowledge within mechanics and turbines in the hydropower plant and construction competencies within dam construction. These competencies are necessary to offer basic services within hydropower and if these are acquired the remaining competencies will come with time and more services can be offered. Even though the different strengths and weaknesses in competence areas an overall picture from the questionnaire is that a major strength of ÅFHP is the collective competence areas to be able to offer a broad offering of services within hydropower. The questionnaire highlights a weakness regarding few senior consultants in some areas. Several respondents in the questionnaire consider a weakness in a specific service, service_A, and the reason is lack of experience and references.

6.4 Organisational practices

To enable transfer of knowledge, rapid learning and professional education of junior consultants ÅFHP provides junior consultants to a self-cost price in larger projects with more experienced consultants. It serves two purposes: senior consultants cannot do everything in a project and the junior does some of all tasks *and* seniors also act as a mentor to make sure junior consultants are developing their competencies and experience. The result from questionnaire indicates ÅFHP's performance is at market level. Knowledge sharing and cooperation between different hydropower offices was in the questionnaire considered as a primary strength compared to the competitors and ÅFHP was considered to perform above market level according to respondents. ÅFHP's performance regarding cooperation between different divisions as Industry and Infrastructure was at market level according to results from the questionnaire.

Consultants often face same or similar projects and there are certain templates that are filled or processes to be followed. In addition there is also in reality, where single consultant use their own templates or knowledge from similar projects. However, at ÅFHP there is a goal from managers of increasing the re-use in the daily work and the employees agree that there is room for improvement and also to increase it. Reuse of documents was in the questionnaire considered that ÅFHP performs below market level. Innovation by experience is a part of the corporate culture and ÅFHP has examples of introducing new ways of organising and challenging how it traditionally has been. The sources of experiences have come from the different acquisitions from former firms and the best i.e. processes of each former firm and firm's culture is brought in to ÅFHP. This can also be seen as a risk of acquiring new firms. The risk can be losing experienced consultants when they are moved to another office and also face new corporate culture differences.

ÅFHP can still be considered as a relatively young organisation in the ÅF corporate group. Compared to its competitors in hydropower when it comes to routines ÅFHP are not as fully developed and that give advantages. The ÅFHP organisation is characterised as being adaptive to market changes and new customer needs and this has been seen as strength at ÅFHP from the answers in the questionnaire. Ability to try different methodologies and also new organisational solutions are encouraged at ÅF. A strategy in a neighbouring department was to take a prestigious project which enabled them to grow quickly. It offered a platform to attract new employees and receiving new projects. This project is treated as a standalone organisation in the division with its own economic results. Physically it has a dedicated one floor in the headquarter. The continuity and quality is increasing since the consultants are working fulltime with the project and not part-time with different projects. This is claimed to be something new and untested in the technical consulting business and it is an example of a ÅF capability in adapting its organisation. Further illustration of this capability was described earlier of the new organisational change that has taken place, which will facilitate the growth of the hydropower division.

7. Analysis ÅF

This section will give an understanding of ÅF's status by analyzing the situation of ÅF hydropower by evaluating their resources and capabilities and its possible importance of providing competitive advantage.

7.1 Resources

According to (Grant, 2010) different types of resources within the firm constitute the foundation of creating firm's capabilities. The different types of resources will be divided into tangible and intangible resources (Grant, 2010) and more specific as Mills, Platts, Bourne, & Richards (2002) suggests.

By assessing the tangible physical resources as offices at ÅF employees says that it is strength at ÅF since they have a dispersed network of offices in Sweden and are therefore close to the customer, which improves the customer relationship. The geographical spread of main offices within hydropower is located close to important customers at four locations considering hydropower. In addition to these four other offices in the corporate group of ÅF is available. However, it is believed that building and offices does not possess a competitive advantage for ÅF, based on assessment of using the VRIO-framework. ÅF employees agree that being close to the customer is seen as strength, since it will provide easier way of communicating, therefore it can be said it creates value for the customer. In evaluating the rareness and imitability similar geographical presence are found by the competitors and building new offices is considered easy. In perspective of exploitation in the organisation the amount of offices enables ÅF to meet certain wishes by consultants, since it enables them to work in a desirable office.

Tangible physical resources also include financial resources. Having strong financial assets are seen as important in this area in order to grow on the market. Growth can be driven by acquisition of other firms to strengthen weaker competence areas to increase the service offering. The financial ability at ÅF is equal comparing to the industry peer Competitor_1 when comparing debt-to-equity ratio. From a VIRO perspective is the financial resource valuable, since it allows growth and acquisition. However, it is not considered rare since it is a resource that many peers possess similar financial strength and cannot be seen as imitable either due to its nature. The financial strength is also seen to be exploitable by the organization. To summarize it can be evaluated that the financial resources constitute no competitive advantage.

For the intangible intellectual resources as brand and reputation considering ÅF corporate group they are well known in industry of technical consultancy services due to the long history of ÅF. As described in the empirical finding the brand ÅF hydropower was not often mentioned in the short list when asking for firms in the industry. By assessing the value of the intellectual resources the ÅF brand is regarded as a valuable brand within technical consultancy services and is with trademarks protected by intellectual property rights. However, from the finding in hydropower market data, the

brand written on the jacket of a consultant is of little importance of choosing a consultancy firm and it is instead the individual consultant with its competence.

Regarding the knowledge resources they constitute one of the more important resources of a service firm. Being an attractive firm for the customer in hydropower industry depends mainly on having different competencies, seniority and the amount of consultants they have to offer. Today, ÅF has developed several competence areas, which can be regarded as strong and offer a competitive advantage. The explanation to the competitive advantage lay in having and retaining good qualified consultants and attracting senior consultants, since one of the requirements of customers was to offer experienced or senior consultants. The number of consultants is relatively low in general in industry they are hard to attract and hire they can be treated as rare resource. Senior consultants are valuable since they bring and attract new customers. By evaluating knowledge resources they serve as a competitive advantage, as senior consultants are a source of competitive advantage, weighing valueability, and rareness. The degree of imitability would arguable decrease with time since more junior consultants will gain more experience and increased customer awareness. The areas where senior consultants at ÅF are presented see figure 19. This is consistent with what Amit & Shoemaker (1993) say that access to knowledge is important for a firm's competitive advantage.

7.2 Capabilities at ÅF

The capabilities identified at ÅFHP, "Young and Hungry", "One-ÅF" and Competence Management are presented and explained in following subchapter.

7.2.1 New thinking and unconventional solutions - "Young and Hungry"

This capability is explained as ÅF challenge old ways of doing business and takes the chance of trying something new and uses other ways than traditional solutions. An example of this kind of solution in a neighbouring organisation was taking a new prestigious project, which offered the specific organisation to grow and gain attention in industry, which made it possible to attract more consultants. Being new in industry has given ÅF benefits to position itself as something more agile than industry peers, which is seen as more traditional, and customers have distinguished ÅF as a young listener. The reason of being associated as young in industry is believed that ÅF is a new actor in industry, thus with an organisation deriving from previous Energo with a long presence in industry. This will raise the question of how well this capability actually are spread in the organisation in different offices, past corporate culture of former Energo may still present. The relationship between consultant and customer is strengthened by being associated as a listener by understanding the clients preferences and not adopting traditional solutions. Close customer relationship is what (Kaiser & Ringlstetter, 2011) describes as one of the different differentiation strategies a service firm can follow to enhance the quality aspect. Objective of using new alternatives and solutions is that the industry is conservative by nature and new thinking may be perceived negatively due to

path dependency. However, this is believed to change with time since part of the conservatism may derive in the older generation working within hydropower.

An explanation of the capability of being a new thinker may be explained in the growing organisation since it has flexibility, the boundaries are not completely defined and routines are not fully developed. It is believed that routines will impede flexibility and creativity. As the organisation turn to be larger the lack of routines will be a disadvantage due to low performance. To conclude it may be arguable that it exist a trade-off between creativity and routines. Strength for ÅFHP is that Energo with certainty has developed routines and efficient work methodologies, which is shared by informal channels and spreads to different offices.

Using the VRIO-framework this culture will meet the valuable criteria since it can result in increased revenues by generating more projects by better customer relationship and increased perceived quality by customer due to better customer awareness by being positioned as a listener. The question of rarity is believed to be medium, since other competitors are facing same environment with young consultants in the organisation, so the ability to provide same or similar capability by competitors lies in the corporate culture in the specific firm. This means that managers must provide sufficient freedom and flexibility to allow for new solutions from for instance younger and new consultants and a structure in the organisation that e.g. allows creating dedicated teams for a specific project. To be able to offer such capabilities it needs enabling resources as financial strength since new solutions are not per se a good solution and there is a risk for it to turn to a troublesome after a time and it can turn to a wrong direction and extra resources might be needed to turn it right. Imitability is perceived as high mostly since the brand ÅF hydropower is relatively new and can be considered as young in industry. The firm's organisational capability to exploit the capability is medium since there are different offices and it is believed that different corporate culture and awareness is different and some heterogeneity might be present due to historic reasons. To summarize the performance criteria using VRIO it can be evaluated that the capability offers a temporary advantage and the economic implication is that it ought to give a normal to above normal performance.

7.2.2 "One-ÅF"

A capability and strength often mentioned by employees at hydropower is the ability to act as one large organisation. This is a corporate vision set by ÅF and the strength of this capability is two-fold. Towards customers they can be seen as a larger organisation than ÅFHP actually are by offering competencies and references used in other related industries. This has been seen as important and crucial to drive growth by acquiring new projects. The logic behind this is that customers see them as stronger since there is a redundancy in consultants, competencies, experience in projects and it strengthens weaker offices. Further benefits for customers are the usage of advanced and expensive tools as 3D scanning used in other parts at ÅF.

In perspective of ÅF it is a strength since it enables and facilitates co-operation among different divisions and other departments and an explanation is the flat and low hierarchal organisational structure that decrease the administrative processes, which can be described as a enabling capability to “One-ÅF” or a technical capability which is one of (Lopez-Cabrales, Valle, & Herrero, 2006) different types of capabilities. “One-ÅF” give rise to a additional sales capability, since ÅF can more easily provide one complete offer to customer, which purchases all services at same time to hydropower, nuclear, and wind etc. by shorter ways of communication and cooperation. The IT-system, One, is a resource enabler, were features as searching for desirable competences or other similar projects which has been performed and by searching persons can easily be found. The potential strength in the capability/vision is different at ÅF. Managers confirm that the capability of “One-ÅF” is seen as strength and has enabled ÅF to work more efficiently but a consultant said it is a vision but in reality there is administrative issues that sometimes raise problems. The different opinion in how it actually works is something to raise and be aware of and to improve and this capability is denoted the managerial capability and describes the ability to create a vision and spreading and facilitating the vision according to Lopez-Cabrales, Valle, & Herrero (2006).

The capability of one-ÅF has to be seen as valuable and rare to a certain degree since ÅF has taken it one step further by creating a vision compared to competitors. Degree of imitability is considered high since it include an organisational structure that allows it, an IT-system but users of the IT-system is as important to make the capability work. The capability is exploited by the organisation. If ÅF manage to tap and exploit this rare capability of having “One-ÅF” and continue to develop their core competence in facilitating and enable the work of cooperation among different business units and organisations according to Javidan (1998) the capability offers a sustained competitive advantage.

7.2.3 Competence management

The hydropower industry and ÅF is aware of the need of educating new fresh graduates and to develop senior. Due to the lack of senior consultants in some competence areas the vulnerability if this consultant leave is considered high. The solution is to become less dependent in the competence area. Educating junior consultant and knowledge transfer from senior to junior was considered as an important capability. A capability that is important for transfer of knowledge is by reuse. Reuse is a way to be more efficient and is done by creating structure in processes and it can be done using templates and by standardization. Reuse can take place by formal methods using templates and have an IT-system that facilitates sharing of knowledge. Reuse does in practice take place in an individual level and were the consultants do it by themselves.

The capability is regarded as valuable since it is a quick way to let junior consultants receive experience by sharing and gaining knowledge. Secondly, it provides the consultant to distribute time from senior consultants to more supervision of more projects than actually doing basic tasks. Due to lack and the cost of having experience

consultants all major technical consultants firms have junior training and it is more seen as a prerequisite and a primary and fundamental value creating process for these types of firms. With this said it could be regarded as a non rare capability and imitable by others. The capability is exploitable by the organisation and of frequent use, but as the questionnaire indicated improvements are to be considered. To assess the competitive implications of applying Barney's VIRO framework is that the capability is regarded as parity and the economic implications as normal. To conclude this capability is a threshold capability that is fundamental of being in the market for ÅFHP.

7.3 Concluding remarks

Human resources are essential since they serve the basis for a competitive advantage but it is the capabilities within the firm that is important to exploit these resources to its full potential that will determine if a competitive advantage can be built. The more common resources as offices and brand constitutes as threshold resources, but are still important to stay competitive since they serve as resource and capability enabler.

As Lopez-Cabrales, Valle & Herrero (2006) conclude that capabilities can be more important than tangible resources and for ÅF two important capabilities are categorized as temporary to sustain competitive advantages. The most important capability found at ÅF is the vision "One-ÅF", according the assessment done with Barney's VIRO framework. The capability combines different capability types proposed by (Lopez-Cabrales, Valle, & Herrero, 2006) of managerial capabilities and technical capabilities. The capability to work as one organisation, which is named as "One-ÅF" is a sustained capability if ÅF continue to develop enabling capabilities to a core competence. This is consistent of what Prahalad & Hamel (1990) that a sustainable competitive advantage is dependent on building and exploiting core competencies, which is important capabilities for the firms competitive advantage. In figure 20 a summary of the resources and capability can be found.

	Valuable	Rare	Inimitable	Exploitable by the organisation	Competitive implications	ÅF performance	Strength or weakness
Resources							
• Offices	Y	N	N	Y	Threshold	Normal	Neither or
• Financial Resources	Y	N	N	Y	Threshold	Normal	Neither or
• Brand	Y/N	Y	Y	N	Threshold	Normal	Neither or
Competences							
• Competence_area_A	Y	Y	Y	Y	Sustain./Temp. adv.	Above Normal	Strength
• Competence_area_B	Y	Y	Y	Y	Sustain./Temp. adv.	Above Normal	Strength
• Competence_area_C	Y	Y	Y	Y	Temporary advantage	Above Normal	Strength
• Competence_area_D	Y	N	N	Y	Threshold	Below Normal	Neither or/Weakness
• Competence_area_E	Y	N	N	Y	Threshold	Above Normal	Strength/Neither or
• Competence_area_F	Y	N	N	Y	Threshold	Below Normal	Neither or/Weakness
• Competence_area_G	Y	N	N	Y	Threshold	Below Normal	Neither or/Weakness
• Competence_area_H	Y	N	N	Y	Threshold	Normal	Strength/Neither or
• Competence_area_I	Y	N	N	Y	Threshold	Normal	Neither or
• Competence_area_J	Y	N	N	Y	Threshold	Normal	Neither or
Capabilities							
• "Young and hungry"	Y	Y	N	Y	Temporary advantage	Above Normal	Strength
• "One-ÅF"	Y	Y	Y	Y	Sustained advantage	Above Normal	Strength
• Competence management	Y	N	Y	Y	Threshold	Normal	Neither or

Figure 20 - Summary of resources and capabilities

8. Analysis

In this chapter the findings from earlier chapters are combined in a GAP-Analysis where the requests within each growth factor are mapped against ÅFHP's performance to identify potential gaps. The chapter continue with an analysis of the mapping where the growth factors, ÅFHP performance and gaps are discussed.

8.1 Introduction analysis

For each growth factor identified in earlier chapters the customers are requesting factors that can be potential sources of growth for ÅFHP if successfully fulfilling them. By mapping ÅFHP's performance within each growth factor that customers are requesting potential gaps can be identified. These gaps constitute the difference between present performance for ÅFHP and requested performance from customers and are presented in figure 21 and is followed with a deeper explanation.

Growth Factor	Requested	ÅF Performance	Identified gaps
1. Small Scale Hydropower	<ul style="list-style-type: none"> • Cost-rational solutions • References from small-scale plants • Standardised documentation and solutions • Use of economic of scale factors • Understand challenges for producers 	<ul style="list-style-type: none"> • Same offer independent of customer or plant • Use references from international large-scale plants on website • Low degree of reuse • Individual based work, low degree of sharing • Project focused, task or solution driven 	<ul style="list-style-type: none"> • Targeted services for small scale • References on small-scale • Usage of re-use • Lack of standardised processes • Too focused on unique project, do not understand customers challenges

Growth Factor	Requested	ÅF Performance	Identified gaps
2. Change in legislation	<ul style="list-style-type: none"> • Adaption to future changes in legislation • Help understand how it affect producers • Way to minimize the uncertainties • Complete offer of services to adapt to change in legislation 	<ul style="list-style-type: none"> • Low degree of knowledge of changes in legislation and how it affect customer • “Young and hungry” • Adaptive organisation • Excellent competencies within environment 	<ul style="list-style-type: none"> • Knowledge of challenges customer facing • Agile organisation can adapt quickly • In-house knowledge of present investigation and possible effect on customer. • Cannot offer competencies within all areas.
3. Risk minimization	<ul style="list-style-type: none"> • References • Quality • Experienced consultants • Worked with customer before • Continuously communication • Trust 	<ul style="list-style-type: none"> • Database of references • Few senior consultants • Good customer relationship • New actor in market, small and relative unknown • Can use “One-ÅF” to reach new areas • Close to customer regarding offices • Expertise in Colenco that can be used 	<ul style="list-style-type: none"> • Coordinated database of references • Lack seniors in strategic areas • Work with a few customer • New actor which can lack in perceived trust • Can use international projects as references and claim experience

Figure 21 - Summary of analysis

8.2 Growth Factor 1 – Small-scale hydropower

8.2.1 Customer Requests

Customers within small-scale hydropower are requesting services specialised for them. These customers have plants that do not produce in the nearest the same amount of electricity as the large-scale and are continuously fighting for profitability. They seek consultancy services that are cost-rational in terms of delivery. To ensure that the consultancy firm can do this they want to see references on projects and plants similar to the ones they possess. The customers want to see an increased level of standardisation where the documentation and solutions is not created uniquely for their small-scale plant and it that way decrease the cost for the customer. They also believe it exist other economic of scale factors possible to use to ensure the best and most rational solution for them. In comparison to large-scale plants it is important in the small-scale plants that the consultant working as well as the consultancy firm understand and see the full picture of the customer and the challenges they are facing.

8.2.2 ÅF Performance

To be able to find gaps between customer request in small-scale hydropower and ÅFHP performance it is necessary to understand how ÅFHP perform within the relevant areas. ÅFHP is offering the same services to large- and small-scale hydropower. ÅFHP is using the same references independent of customer and for instance the webpage is only using large international projects as references. Some of the processes, as bidding, are standardised but the degree of re-use is overall very low. The consultants can in some areas use old reports to achieve some degree of economies of scale but other type of standardisations are rare. Rare is also the sharing of knowledge and experience between consultants which decrease the economies of scale by learning between projects. The consultants as well as ÅFHP as firm is focused on unique project and its task which is natural since it is the customers' as well as the economic incentives focus.

8.2.3 Identified gaps

By mapping requests from small-scale hydropower customer and ÅFHP's present performance gaps can be identified. The first one is the offering. At present moment ÅFHP is offering the same services to small- as large-scale hydropower plant customer, which make it difficult for small-scale customers to relate to. The references ÅFHP uses are focused on large prestige projects but the customers want to see references on similar projects and plants as they have. It is also a gap in the amount of re-use and standardisation. Something to bear in mind is that reuse is dependent of type of knowledge and if it can be codified. Explicit knowledge is easier to codify, store and share to other consultants compare to tacit knowledge. Working with tacit knowledge is also a part of providing cost-rational solutions to small-scale hydropower customers were senior consultants supervise junior consultants to enhance quality of the service and also to offer a lower price, due to economies of scale in using senior consultants. To be able to offer cost-rational solution the working processes have to be standardised

and re-used instead of doing unique documentation and solutions each time. The last gap within small-scale hydropower is the fact that the customer wants consultancy firms and its consultants to see the full picture and understand challenges for them while ÅFHP is very focused on unique project and task and instead see the overall challenges the customer is facing.

8.3 Growth Factor 2 – Change in legislation

8.3.1 Customer Requests

Today, it is still a considerable amount of uncertainties relating to the two new directives in what way hydropower industry will be affected. The uncertainty grounds in the increased environmental focus but it is difficult to describe which investments it will be in future. It can be everything from services in mechanics of the plant to services relating to new construction or changes in the existing dam. This uncertainty is met by certain requests from the customer and what they want is to decrease the level of uncertainty. The customer is aware of the new legislations and that it will affect the hydropower plants. The requests from customers are regarding ways to minimize uncertainties. Requests as support in what adaptations in future will be needed due to changes. Secondly, they want to find ways to minimize the uncertainties and also help to understand in how plants will be affected. Due to the different areas that involve a hydropower plant customers' requests a complete service offering.

8.3.2 ÅF Performance

ÅFHP has a low degree of knowledge regarding the two directives and the uncertainties of how it will affect customer since it is not something that is present in the daily operation. One capability that is seemed as strength is their agile culture in offering something new and being progressive in hydropower to handle these changes in legislation and the uncertainties. This capability is expressed by ÅFHP as being receptive and listens to customer needs. Further identified strength is their capability of adapting to new market changes and needs, which changes in legislation would cause. The different levels in competences serve to be a weakness depending on the uncertainties in what type of investments that will be requested. The expert competencies within environmental services can be strategically important due to the environmental focuses of the investigations.

8.3.3 Identified gaps

An identified gap is the information asymmetry regarding knowledge about new legislations and what challenges the customers are facing. Customers know more than ÅFHP even if the knowledge within ÅFHP varies from consultant to consultant. As aforementioned a fit is the agile organisation, which is considered as a competitive advantage for ÅFHP. Another fit is the capability of being progressive and associated as a listener, which can be seen as useful to be able to adapt fast to new customer needs. A gap exists within certain competence areas that might be affected by new regulations.

However, ÅFHP is well positioned in providing competencies within environmental services since the directives are derived from environmental concerns.

8.4 Growth Factor 3 - Risk minimisation

8.4.1 Customer request

The customers want to minimise risk when hiring consultants and they are therefore evaluating different criteria. The customers want to see references from projects performed earlier to ensure competencies and experience. They also want to ensure that the project is performed with good quality. Customers seek experienced consultants preferable senior consultants with long and relevant experience. It is appreciated if the consultant has worked with them before since it can facilitate the informal communication, which increases efficiency in projects. Lastly, customers want to feel that they can trust the consultancy firm and its consultant. They want to see that consultants work according to customer's requirements and goal.

8.4.2 ÅF Performance

ÅFHP has a good base of references from different projects they have performed. However, they are not structured in a way that make it easy to use with standardised format and collected in one place. They have senior consultants within some of the areas but are missing in some of the other areas. This affects both the specific area as well as the possibility of taking complete responsibility for projects requesting senior competence in all areas. However, by using other areas within the organisation some of the competencies can be located. ÅFHP has good customer relationships but is working with relatively few customers. ÅFHP's offices have a strategically position where the distance to customers is short. The ÅFHP brand is relatively unknown in the industry and the reason is mostly due to the last years acquisitions such as Energo where the competencies have entered ÅFHP but the market has not registered it. ÅFHP has the possibility to use resources from Colenco in Switzerland, which has long experience in the field.

8.4.3 Identified gaps

The first gap that can be identified is the structure of the references. Customers want to see references of earlier project which ÅFHP has but not in a structured and standardised way. Secondly, the customers request senior consultants which ÅFHP has in some of the areas but lacking in others. This can harm projects where a broad area of expertise is requested. ÅFHP has however Colenco, which possess a lot of experienced competencies. This resource is used, if at all, in a very low scale. The customers want to work with consultant that has been used before. ÅFHP has good customer relationship with the customers they are working with but the risk is that they miss out the customers that they have not been working with when narrowing the scope of customers. Due to ÅF's rapid growth in hydropower by the acquisition of Energo the customer have not got attention and been aware that ÅF is offering consultancy services

within hydropower. It is important to explain for the customer that the consultant is experienced and has earlier experience from e.g. Energo to gain the customers trust.

9. Recommendations

Small-scale hydropower

Small-scale hydropower was identified as a growth factor and several gaps were found between market requests and ÅF performance. The overarching and describing recommendation is to focus more on small-scale hydropower. With more focus on services to small-scale hydropower follow some changes and recommendations in how ÅFHP can target this group of customers and their needs. ÅFHP should increase customer's awareness about ÅFHP's services in small-scale hydropower. As it is now the brand is relatively unknown and neither customer nor competitor have realized ÅFHP's position. Means to increase customer awareness done by presenting earlier projects conducted in Sweden of small-scale hydropower plants, with purpose to show that ÅFHP does not only do prestigious international projects but also serves the Swedish market within small scale hydropower.

By targeting small-scale customers other needs have to be met compared to large-scale hydropower and based on their unique market characteristics they have a request of cost-rational solutions. Their request of more cost-rational solutions can be achieved by having a more standardized way of working and reuse from earlier projects. A project is by definition something unique and customized compare to a product that is manufactured in series. However, a suggestion is to identify the activities that occur frequently and exist every time a new project starts and develop e.g. a template or a working process. The application of the reuse concept is good for customers as well for ÅFHP. For small-scale hydropower customers increased reuse would mean more value for money. At present the degree of reuse has been limited at ÅFHP. The explanation have been the young and growing organization so any need of reuse has not been necessary but there is awareness that it will be necessary to increase the reuse when the organization grows. So increased reuse will be beneficial for both customers and ÅFHP.

Further recommendations for targeting small-scale hydropower are besides solving a problem for the customer is to further understand customer challenges of what they are facing. Since it can be difficult to have a close customer relationship with small-scale hydropower owners due to the amount of them the recommendation is to have a general understanding of what trends and drivers that are affecting them in near future. If ÅFHP continues to build upon its recognition of being a listener to the customer and being more updated with what is happening in the industry they will increase the quality aspect and a differentiation can be achieved in this homogenous service industry.

Change in legislation

Political statements influence the energy sector as well as the hydropower industry and today two new directives that will change the industry are in process. The outcome of these changes are still uncertain but the plant owners are believed to be affected in a

negative way due to the changes they have to follow. However, this means increased demand for technical consultants. Due to the uncertainties of what will have to happen in the industry and where not even the plant owners know the full picture, it is recommended that ÅFHP continues to follow these changes and increases its knowledge within this field. This can be done by attendance at seminars by consultants and by sharing the presented information to the ÅFHP's organization to increase the organization's awareness of what is happening in industry. Additional knowledge can come from customers by hosting seminars or workshops with customers. This will also strengthen customer interaction and it will provide a platform of knowledge sharing between different stakeholders by gaining insights of what they know and what they will be facing. The purpose is to increase the quality aspect and to gain customer loyalty. In order to continue to grow in this rather limited market with a few large customers is to maintain and have a good customer relationship that could be a way. Hosting workshops will also give increased recognition in hydropower.

As found in the analysis the agile organization serves to be beneficial for ÅFHP, which quickly can adapt to changing needs. A recommendation is to be good in performing projections for hydropower plants and this initial work will serve as a way to receiving more work and sale of projects if it is matched with services ÅFHP can provide. For the areas where competencies are missing it is recommended to fully explore the IT-system, ONE. A recommendation is to continue to list in-house competencies throughout the entire organization of ÅF so they can easily be found and to identify important competencies that can be needed for services within hydropower.

Risk minimization

The identified existing need from customers was risk minimization. If ÅFHP manages to deliver what the customer asks they will be successful by fulfilling their present needs and also gaining customer loyalty. Part of the risk minimization lies in the requests of having previous references of projects and a recommendation is to offer a categorization of references based on different features as e.g. type of project, size, customer and learning, so it is easier to find relevant references to the targeted customer. In the strategy of targeting specific customers standardized templates are suggested to be developed. In addition of presenting references it is suggested to present challenges, problems and solutions for that particular references which would increase the customer's trust. Customers identified the importance of having senior consultants as quality insurance and since ÅFHP lack senior consultants in some areas it is recommended to work to minimize them. Identifying which senior consultants are necessary to fill the gaps and minimizing the gaps. It is however hard to close the gap due to the low amount of high experienced consultants. The recommendation is to continue the work in-house at ÅFHP to identify consultants in neighboring departments and offices that would be valuable to use within services in hydropower. Further recommendations are to decrease the administrative barriers that exist between different divisions to facilitate sharing of resources across divisions. Letting ÅFHP consultants suggest other external consultants for specific areas can be done in finding

new consultants. When the consultant is identified the next step is to pinpoint specific unmet needs by the consultant and see what ÅFHP can offer to attract the consultant.

To decrease the dependency of senior consultants it is suggested to speed up the process in developing experienced consultants. A suggestion is to have a long-term strategy in developing junior consultants to experienced consultants. When experienced consultants have been developed it is recommended to identify the needs of every person and try to meet them in some way. There is a tradeoff regarding this situation where customers are aware of the problem of few senior consultants and still they demand experienced consultants. A solution can be to develop consultants together; customer and ÅFHP. Where the customer offer practical work in real projects for junior consultants together with experienced and were the customer take a part of the cost of educating. The benefit is that the junior consultant can increase the relationship with the specific customer and the customer makes a "stickier" bond to ÅFHP. The consultant will be developed to a valuable asset to both stakeholders. A risk is however that the relation between customer and consultant would turn high and the attachment to ÅFHP will be lower and the consultant would leave ÅFHP in favor for the customer or competitor. Building experience in consultants is necessary and one method used in a neighboring department was to rotate a position among different consultants to develop and gaining experience of a typical project. In perspective of customers being risk minimizer this type of experience enhancer might not be suitable to have rotating persons due to inconsistency and customer relationship.

Being relatively new and not a brand that is associated with hydropower can be seen in different perspectives, parts of ÅFHP have significant experience due to acquisitions of firms and other parts are relatively new in a ÅF organization. For customers it is mainly the consultant's reputation and experience that counts in selecting service provider and not the brand. A recommendation is still that ÅFHP should increase its brand recognition and continue to focus on ÅFHP's experience in hydropower by exploiting its history from Energo and also be associated as being young and a listener were you put the customer in first place. ÅFHP should however in a long-term perspective increase its recognition within hydropower and strengthen its brand and at same time become less dependent of Energo.

ÅFHP is aware of the need of having an even distribution of different customers, with an equal proportion of sales to every customer, with aim of not being too dependent on customers who has major shares of ÅFHP's sales. The recommendation is to continue the work to even out customer distribution among different customers and have large- and small-scale hydropower customers.

10. Discussion and Conclusion

This chapter begins with a discussion of the research where critique to the method is illustrated together with what the researchers could have done differently. The chapter continues with conclusion where the research questions are recapped and answered.

10.1 Discussion of method

To be able to understand how this research could have been better and which factors that could have affected the result it is important to discuss how the research has been performed and if other choices could have given other results. The thesis was limited to technology consultancy services within hydropower in Sweden. This is something that was necessary to keep the scope of the thesis in a reasonable size with regard to the time frame and to ensure enough depth in relevant areas. It could have been relevant to include Norway in the market investigation due to its high amount of hydropower together with its geographically proximity to Sweden. However, this would have meant more interviews with customers, which would have affected the time frame. Norway is also different regarding conditions of legislation and topography.

The qualitative research strategy was necessary to be able to investigate the dynamics in market. Even though, a quantitative approach was used in the questionnaire it was the qualitative data that laid the foundation for the findings and analysis. The research design used in the thesis was a case study. Since the researchers have not been interested to generalise the findings and analysis outside the scope of ÅFHP and hydropower market in Sweden the choice of design was naturally. The drawbacks from using a case study are that the research is fixed to the investigated scope even though the market findings can be useful for other actors than ÅFHP.

The interviews performed on both market and ÅFHP were made with a semi-structured approach. It was a good decision to use this compared to open interviews since the research was rather focused and it is difficult to guide the interviewee in open interviews. It would also have been difficult to use structured interviews due to the different positions interviewees had. Depending on their position they had different aspect and depth in knowledge of different areas that would have limited the knowledge transfer if using structured interviews. Another aspect of not using structured interviews was that the purpose was not to quantify the empirical data. The researchers used notes as transcription method for all interviews. Notes worked well seen from a process perspective but it would have been useful for some of the interviews to use recording equipment to be able to go back and analyse the dynamics and aspects in some of the answers. The interviewee objects varied from managing director to engineer. This width of level in organisation has given the research a depth and width of different aspects depending on which responsibility the interviewee had which is good. However, it can have affected the research negative in form of errors in the answer seen from a homogeneity perspective. Some of the answers given of unique

persons have been considered too affected of the individual persons position and neglected in empirical findings.

The sampling process varied between ÅFHP and market. For ÅFHP the supervisor provided a list of persons. Since the amount of persons were relatively few the researchers decided to contact all of these persons, which was a mix between senior consultants, managers and managers from other divisions. Even though not all persons on the list were interviewed due to lack in response of contact, were everyone contacted and invited. The interviews were performed face-to-face at their different offices, except for one telephone interview. Due to the complete list of persons and their position within the firm the researchers believe the thesis has captured all relevant aspects of ÅFHP. The questionnaire was sent out to all consultants employed in the hydropower organisation. By sending the questionnaire to everyone the researcher ensured a complete picture as well as those consultants that wanted to contribute to this research have had the opportunity. The sampling of interviews for market data was made by contacting HR or PR department to find the first relevant person. After the interview of this person a snowballing strategy was used to propose further persons within the company. The snowball method was good seen from the perspective of identifying person of interest since the interviewee after the interview had good knowledge of the area of research and which person within the organisation that could contribute to the research. The drawback is that it was difficult to ensure that the person had knowledge of the area and suitable to interview. However, due to the large amount of interviews performed the researchers believe that the collected picture of the market was captured even if a single interview was either to broad or to technical specific.

10.2 Discussion of results

In this thesis resources and capabilities were identified at ÅFHP. As explained in the theory presented by Javidan (1998) were capabilities compare to resources seen more valuable for the firm see figure 22. The findings in this research indicate that this varies depending upon what type of resource discussed. It is believed that in the service industry and in particular the hydropower industry resources as knowledge would have the same properties and status of capabilities when it comes to value. This is also consistent with the view of Lövendahl & Revang (2001) presented in theory.

ÅFHP has a strategically goal to go from today's 50 consultants to 120 within the next three years. The thesis outlined growth factors and organisational gaps to ÅFHP which by minimising can provide organic growth. However, the researchers are questioning the reasonableness of achieving the goal by just these growth factors. To achieve the goal it is important to work with the recommendations stated in this thesis but also identify potential consultancy firms within hydropower to acquire. This strategy is something ÅFHP have used earlier within the acquisition of Energo and the researchers believes it will be important to continue with this strategy to reach the strategically goal.

Lastly, the researchers will highlight the importance of customer relationship. As it is today in the industry the relationship between customer and consultant is a major factor when choosing who to work with. It is important for ÅFHP to ensure that the relationship also is bound to the organisation and encourage the consultants to share the advantages achieved with a good customer relationship. This is also something that can decrease the importance of unique consultant and improve the relationship between customer and ÅFHP.

10.3 Conclusion

The purpose of this thesis was to outline a growth strategy for ÅFHP. This was done by identifying growth factors within the market and mapping them against firm's resources and capabilities to identify gaps. By giving recommendations in how ÅFHP can minimise these gaps growth potential appears. To be able to fulfil this purpose one research question with two sub-questions was formulated and by going through respectively sub-question and ending with the research question this section will conclude findings and result for each question. The first sub-question was formulated as:

- *Which growth factor will be important within the hydropower market?*

To be able to answer this question the market was divided into new and existing need with respectively question:

- *If existing, which new customer needs can be found within the market?*
- *If existing, which existing customer needs can be found within the market?*

The thesis identify three customer needs; Small-scale hydropower, Change in legislation and Power regulation. The two first ones were after the analysis considered to be growth factors for ÅFHP and the last one was not considered to be a growth factor due that it do not generate considerable amount of demand for services. In small-scale hydropower the customers are requesting adapted solutions and services based on their need. Many of the consultants are providing services to large-scale hydropower and applying the same solutions and methodology on small-scale hydropower that cannot handle the cost of it. The need of change in legislation is mainly regarding uncertainties in the present governmental investigations that can affect hydropower industry considerably. The customers want to understand further how the different investigations can change the situation for electricity production with hydropower.

For existing market two customer needs were found; Risk minimisation and Cost. Cost was after the analysis not considered to be a growth factor due to that cost is measured by hourly prices and the researchers do not believe it is suitable for a firm that face a growth to compete with prices. Regarding risk minimisation projects within hydropower industry are usually large investments for the customers which in turns make them want to reduce risks. Their way of reducing risk is to evaluate the consultant

according to certain criteria (see chapter 5.5) and by better fit these criteria's can be a factor of growth for ÅFHP.

The second sub-question was formulated as:

- *Which resources and capabilities does ÅF possess today?*

This thesis identifies several resources and capabilities at ÅFHP and evaluates them according to the theoretical framework. In figure 20 a summary of identified resources and capabilities can be found including analysis of them. One of the more interesting one is the culture of being "Young and hungry" which for now serve as a temporary advantage at the market. The "One-ÅF" vision is also a capability that is unique for ÅFHP and can be used to differentiate against competitors. Two competence areas, Competence_area_A and Competence_area_B, were identified as areas where ÅFHP have a sustained/temporary advantage in.

The main research question for this thesis, that would be answered through the before mentioned sub-questions was:

- *Given that growth factors exists, how can ÅFHP exploit these to reach their strategic goal?*

This thesis has found three growth factors within the market for technology consultancy services for hydropower industry in Sweden. As aforementioned these growth factors were small-scale hydropower, change in legislation and risk minimisation. For small-scale hydropower ÅFHP should adapt solutions to small-scale hydropower and ensure to have work processes that support cost-rational solutions. For change in legislation the recommendations are that ÅFHP should engage in the investigations and achieve knowledge of the consequences for customers as well as use its agile organisation to quickly adapt to future demands due to the changes. For the last growth factor, risk minimisation, ÅFHP should structure its references of different projects, in best possible way attract senior consultants for strategic areas, develop junior consultants to future senior consultants as well as use the brand of acquired companies as proof of experience and over time develop the brand of ÅFHP.

The recommendations in this thesis serve to minimize the identified gaps for each growth factor. By exploiting the growth factors ÅFHP can lay the foundation for organic growth, which will contribute to ÅFHP's formulated goal.

10.4 Further investigations

Due to limitation in time and resources this research was focused on technology consultants within hydropower in Sweden. The geographically limitation is what the researcher believe has been the one that limit the research the most. Further investigations are recommended to be performed in other markets as well as industries where ÅFHP can be present. Example of markets can be e.g. Norway that is

geographically close to present market and a naturally expansion for ÅFHP. Other industries can be mining industry where e.g. dam safety is highly prioritised.

To be able to meet the strategic goal of 120 consultants within three years the researchers believe that it will be necessary to acquire other firms. Research can be made on potential firms suitable to acquire and evaluate their fit into ÅFHP's present organisation as well as economical evaluation.

Another factor that have been highlighted as important in this thesis is the importance of attract and maintain the consultants of different competence level. Further research is recommended in the area in how the organisation in a better way can attract but mainly maintain the consultants employed. This is especially interesting considering the growth strategy, if it should be achieved it is important that not lose the consultants already employed.

10.5 Managerial implications

The result of this thesis is believed to have provided insights that will be valuable for managers in different service firms and industries. The methodology and frameworks used can be applied to other industries; even thou the result would differ.

The findings of this thesis can be generalised to other scopes. The researchers' believe that the existing need with risk minimisation can be generalised for other service firms outside this unique industry. Same existing need can be applied for other industries as well. The new needs identified are bound to the hydropower industry since it regards legislation and industry specific technique. However, part of the need of change in legislation could be applied to other energy industries. Gaps identified between customer needs and ÅFHP are findings that would be difficult to apply to other firms or industries. It is possible to use the developed framework to map other firms within the industry against the same customer need with different gaps as result

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Appendices

Appendix 1 - Performed Interviews

Interview No	Name	Position	Type of Source	Date of Interview	Length of Interview (min)
1	Respondent 1	Researcher	Academic1	120918	30
2	Respondent 2	Researcher	Academic1	120921	35
3	Respondent 3	Manager of hydropower plants	Trade Organisation1	120927	25
4	Respondent 4	Manager of small-scale hydropower plants	Customer1	120927	30
5	Respondent 5	Manager of environmental questions	Customer2	121005	35
6	Respondent 6	Manager of large-scale hydropower plants	Customer1	121005	40
7	Respondent 7	Manager of hydropower plants	Customer3	121009	20
8	Respondent 8	Responsible of hydropower questions	Trade Organisation2	121010	25
9	Respondent 9	Manager of maintenance	Customer4	121010	25
10	Respondent 10	Manager of hydropower plants	Customer3	121012	35
11	Respondent 11	Manager of hydropower plants	Customer5	121015	30
12	Respondent 12	Business area manager	Customer6	121016	25
13	Respondent 13	Chief executive officer	Customer7	121017	35
14	Respondent 14		ÅF	121018	30
15	Respondent 15		ÅF	121018	30
16	Respondent 16	Manager of investments	Customer1	121019	35

Interview No	Name	Position	Organisation	Date of Interview	Length of Interview (min)
17	Respondent 17	Manager of small-scale hydropower plants	Customer7	121019	50
18	Respondent 18		ÅF	121022	50
19	Respondent 19		ÅF	121024	40
20	Respondent 20	Manager of maintenance	Customer8	121029	40
21	Respondent 21	Investment advisor	Customer9	121106	40
22	Respondent 22		ÅF	121112	70
23	Respondent 23		ÅF	121115	60
24	Respondent 24		ÅF	121116	30
25	Respondent 25		ÅF	121116	60