

**HOW THE SOCIAL AND ENVIRONMENTAL ASPECTS
AFFECT HYDRO POWER PERMIT APPLICATION:
A CASE STUDY OF THE COUNTY
ADMINISTRATIVE BOARD IN VÄRMLAND, SWEDEN**

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Master's Thesis

Jyväskylä University
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JYVÄSKYLÄN YLIOPISTO

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This study has been secrecy checked and approved for publication by Johan Englund at Fortum Sweden



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ABSTRACT

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This study assess how the county administrative board in Värmland, Sweden, considers social aspects in their environmental decision-making processes. The research problem stems from a different view on how to utilize the natural resources of rivers and a general concern for the biological well-being in the water bodies due to hydro power. The study has been conducted with five application cases offered by Fortum Sweden, which were complemented with interviews from the county administrative board. The applications were concerning hydro operation in Värmland, sent in to their county administrative board (CAB).

The result has been presented and analysed with theories of social license to operate (SLO) and social impact assessment (SIA). The study showed that the county administrative board of Värmland acts from a strongly legal aspect. The social aspect is not included in the decision-making process as there exists an imbalance of power in the mediation platform. The imbalance in power hinders the involved parties to engage in communication. Further studies could focus on the internal structure at the county administrative board of Värmland.

Keywords: hydro power, Värmland, county administrative board, social license to operate, social impact assessment

ABSTRAKT

Författare: Nieminen, Lotta S.

Titel: "Hur sociala- och miljöaspekter påverkar vattenkraftsansökningar: En fallstudie om Värmlands länsstyrelse, Sverige"

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Denna studie behandlar hur Värmlands länsstyrelse i Sverige tar hänsyn till sociala- och miljöaspekter i deras beslutsfattande. Undersökningsproblemet härstammar från olika synpunkter och åsikter om hur man skall utnyttja naturresurser såsom vattendrag, samt en generell oro för vattendragens välbefinnande på grund av vattenkraftverk. Studien har gjorts utifrån fem fall av ansökningar, givna av Fortum Sverige. Fallen kompletterades därefter med två intervjuer med Värmlands länsstyrelse. Ansökningarna behandlade olika fall av vattenkraftsverksamhet som var inskickade till Värmlands länsstyrelse.

Resultatet har analyserats och presenterats utifrån teorierna samhällelig licens för drift (eng. *social license to operate*) samt social konsekvensanalys (eng. *social impact assessment*). Studien visade att Värmlands länsstyrelse arbetar från ett starkt juridiskt perspektiv. Den sociala aspekten är inte inkluderad i beslutsfattandet eftersom det råder obalans i maktstrukturen på förmedlingsplattformen (eng. *mediation platform*). Denna obalans hindrar de olika involverade parterna från att delta i en givande diskussion. Framtida studier skulle kunna fokusera på den interna strukturen vid Värmlands länsstyrelse.

Nyckelord: vattenkraft, Värmland, länsstyrelse, samhällelig licens för drift, social konsekvensanalys

ABBREVIATION LIST

CAB - County Administrative Board

CSR- Corporate Social Responsibility

EA - Environmental Assessment

EU - European Union

HaV - *swe.* Hav - och Vatten Myndigheten - *eng.* Sea- and Water Authority

NGO - Non - Governmental Organization

SDG- Sustainable Development Goals by United Nations

SIA- Social Impact Assessment

SLO- Social License to Operate

UN- United Nations

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*The term environment will be used on a rather general level, not referring to any specific aspect of the environment nor environmental aspects of well-being.

*The term mediation will be used to described communication before projects

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1 INTRODUCTION

Everyday life is increasingly dependent on energy, as more of our daily functions run on electricity. Energy is one of the most polluting industries in the world (United Nations, 2018). Hence, should the energy industry modify their operations to decrease the impact on the environment. The energy mix in the Nordics consist of both fossil fuel and renewable sources (Energimyndigheten, 2003). There are country wise differences in which sources are utilized in energy production. This study is focused on the Swedish production of energy. The Swedish government wants to decrease the national carbon emissions drastically and has therefore set a goal for a 100% production of energy with renewable sources by 2040. This ambitious goal opens a large market share for renewable and carbon neutral energy sources.

The most utilized source of renewable energy in the Nordics is hydro power, as the earliest mentions of hydro power dates back to the 19th century. Hydro power plants is the strongest regulative energy source of the renewable energy sources, as it can increase or decrease production of energy within hours according to demand on the market (Karier & Fazio, 2017). The regulative power allows a more precise production of energy and fast reaction to unexpected events, such as abnormal outdoor temperatures. Despite its strong cultural and historical meaning, hydro power has met external pressures regarding environmental impact. The most quoted environmental issue related to hydro power concerns the loss of aquatic biodiversity in the water bodies affected by the power plants (Älvräddarna, Naturskyddsföreningen, Sportfiskarna, & WWF, 2015; Anshelm & Haikola, 2016).

The opposition towards hydro power plants has created a challenging situation for the power companies, as they struggle to convince their external stakeholders about the importance of their business. The social impact of hydro power include changed water levels which can affect the water level in wells and

recreational aspects such as boating and fishing. Stakeholder management of hydro power plants is crucial for the future of hydro energy production.

It is not a new situation that hydro power is meeting resistance in Sweden. In the 1950's the first NGO's started to oppose expansion of hydro power and the battle has continued ever after (Anshelm & Haikola, 2016). The first time environmental opinions have affected political hydro power decisions was in 1960. The opposition continued with success as it later on from 1970's until 1990's developed the legislation in Sweden so that further expansion of hydro power is nearly impossible. In 1998 an Environmental Code was introduced to the legislation. The Environmental Code monitors the environmental aspects of operations with possible environmentally harmful actions. The hydro power plants and other related construction follows the Environmental Code, as the activity is defined as *operation causing harm to the environment* (Environmental Code chapter 10 §1).

With new demands on decreasing carbon emissions, the discussion regarding hydro expansion has risen in the Swedish parliament. A new legislation regarding hydro operations is expected during 2018 and it has been a source of discussion. NGO's have worked together to propose possible actions for the new legislation, whilst company lobbyists strives to improve the situation for the companies. The main aspect which separates the discussion around hydro, is the weighing of which environmental impacts can be accepted in the light of increasing renewable energy production. A hydro power plant has long consequences on a water body, which might never be undone (Atilgan & Azapagic, 2016).

As a part of decreasing Sweden's carbon emissions modernizations of existing hydro power plants is seen as vital. All hydro power plants and dams in Sweden are therefore to be assessed according to new legislative demands. This retrial of hydro power plant construction allows the operator a possibility to increase safety and update the constructions to meet modern requirements, and implement measures to decrease the negative effect of hydro power on local environment. Though, as many of the constructions are old, new requirements can be rather expensive to implement.

In the county Värmland, some opposition of the modernizations have been noted and the industry ponders the reasons behind the opposition. On the website www.second-opinion.se, the discussion regarding the actions of Värmland county administrative board (CAB) have been active. The county of Värmland was therefore chosen as the area of the study and is one of the limitations of the study. Fortum Sweden have given the study access to five cases, for a closer assessment of how the CAB has acted in applications regarding modernizations of power plant constructions or demolitions of unnecessary dams.

The purpose of the thesis is to collect and analyze information on how the county administrative board in Värmland, Sweden, has considered local opinion in environmental decision-making processes. The problem statement is thus: "*The hydro operators in Värmland indicate that the hydro power plant permit application decisions are based on opinions rather than facts*". The thesis will aim at finding an indication whether local opinions affect the decision-making or not. The first question is the main question to be answered with this specific study. Other questions presented are supporting the research to find reliable results. This study will strive to answer these research questions:

- *How is the social aspect included in the decision making at the CAB in Värmland?*
- *How has the CAB argued for their decisions?*
- *How can the situation be described with the theories SLO and SIA?*
- *How would a social impact assessment affect the situation?*

This study is a case study of how the CAB of Värmland considers the social and environmental aspect in hydro power permit applications. The study is conducted with both application cases and interviews, to increase the possibility of finding a reliable answer. The data gathered has been analyzed with the theories of social license to operate (SLO) and social impact assessment (SIA). The theories illustrate how social conflicts can be avoided and how operations can gain approval from the community they are operating in. The disposition of the thesis is presented next.

1.1 Disposition

The thesis is structured with a short overview of the research problem and background information, followed by literature review, methods, data, and results all presented in their own chapters. The thesis will end in a discussion and conclusion of the outcomes of the data and literature relation.

The research problem is presented first with additional background information. In this chapter you can find information regarding Swedish democratic system, Värmland county, hydro power plants, and Fortum.

The theories presented in the literature review are presenting a platform on which the analysis will be conducted. The theories introduced are social license to operate (SLO) and social impact assessment (SIA). These theories strive to shed a light on how the county administrative boards consider stakeholder opinions in hydro applications and how CAB affects a company's possibility for a SLO.

The data used for this study is received from Fortum Sweden. Fortum has shared five cases which highlights how the CAB in Värmland have acted during hydro applications. In these cases one can also read the opinions expressed by the locals. The study is complemented using interviews with employees at the CAB to increase the transparency of the result. The method for this research is case study.

2 RESEARCH PROBLEM

Society is dependent on free-flowing waters as it offers possibilities for transportation and nutrition. Fishing has been an important self-sufficient source for income and nutrition in the Nordics throughout history. In the beginning of the 20th century there was not enough energy production to cover the growing demand. Energy production was allowed to expand on the behalf of the environment to answer the demand (Karjalainen & Järvikoski, 2010). The production of energy grew fast and was soon an abundance in the society. At that point environmental issues started to rise in discussions, as they had been set aside earlier for the benefit of energy production.

The power plants which have been built in Sweden during the 20th century have followed the water legislation of 1918. The water legislation from 1918 has been criticized of being too narrow minded and too focused on increasing the production, and thus excluding the well-being of the environment. As the environmental awareness has been rising, citizens are demanding a more controlled law of hydro power and water usage.

The well-being of fish and possibility of a continuous fishing has been considered when expanding hydro power. This indicates that hydro power operations have reflected over the environmental impacts from a societal viewpoint rather than purely environmental (Internal Experts, 2018). The environmental impacts are significant and there is a demand to improve the sustainability of the power plants, which also would improve the well-being of ecosystems in water bodies.

Despite being an important part of decreasing the environmental impact of mankind, renewable energy sources have their downside. The clean and affordable production of energy requires usage of natural resource such as free flowing waters and land areas. The largest threat towards nature is the action of humans. Land usage destroys habitats, which may cause loss of biodiversity (Jenkins, 2015). Loss of biodiversity compromises the functions of nature, such as pollution of

flora, which are relevant for human well-being (Newbold, 2016). Hydro power spares the land usage but will strongly affect the biodiversity and life in water of the rivers where hydro operations are located.

Though, Civitello, o.a. (2015), does mention that it is important to do ecologically more suitable studies at local areas to be able to assess the real affection of human interaction on biodiversity. Some areas are more resilient than others and can adapt to new habitats. It is also argued that it is the loss of habitat that poses the biggest threat rather than an alteration of habitats. An alteration of habitats must be studied more closely before the real effects can be stated (Civitello, o.a., 2015).

Opposition for hydro power started in the 1950's in Sweden and has grown ever since (Anshelm & Haikola, 2016). The success of the opposition during the 20th century has led to political decisions that hydro may not expand in Sweden in both 1986 and 1993. Though, the alarming need to address global warming has changed the way political discussion regards hydro power. Hydro power has gained back its status as a profitable way to decrease the global pollution (Anshelm & Haikola, 2016).

Anshelm and Haikola (2016) mention that the opposition gained a lot of ground in the 20th century as they were able to change their approach from cultural aspect into measurable facts. Measurable facts, or "hard facts", provide a better ground for decision-making than "soft" facts such as cultural values do. Simultaneously, the authors claim that the earlier success of the opposition was the background of the individuals opposing. Researchers, lawyers, and journalists joined with NGO's on both a local and national level. They had the knowledge and salience to impact national and local politics and governments.

Today, the discussion in politics is fading out and the national opinion about hydro power has changed. Ever more people are preferring hydro power as a reliable source of energy and the change is visual in the politics (Anshelm & Haikola, 2016). To answer this change in view on hydro power, a new legislation is formed during 2018. The reformation of the law will strive to both increase energy production with hydro, without increasing the environmental damage. This indicates that existing power plants and dams will be re-examined according to new environmental standards. In Sweden, the county administrative boards (CAB) are responsible for granting permits for the hydro power operators, and it is important that their decision follows the national and international legislation, whilst simultaneously reflecting the benefits for the locals.

The research problem is defined and modified according to information received during meetings with internal experts at Fortum. The result of the meetings can be seen in Appendix 1. One of the main issues that was mentioned several times were that the internal experts at Fortum were worried about the level of knowledge at the CAB. They mentioned that some counties react and behave

according to scientific evidence, but others act merely from a legal standpoint creating a strange situation for the hydro power operators. They felt as if the deciding body at the counties lack the proper understanding of how their decision is carried out in practice.

The conflict is mostly visible in Värmland county in western Sweden. The hydro operators are fearing that this sudden interest in environmental retrial of hydro power plants might affect their energy production. The hydro operators have gotten the impression that the discussion of retrials and the environmental impact of hydro operations are affecting the decision-making at the county administrative board. The permit applications processes have been prolonged by extensive exchange of letters and what the hydro operators describe as odd requirements for improving of their actions (Internal Experts, 2018). Hydro operators do not know how to address the situation or how much it will affect the local environment and community.

This study focuses on permit applications of a major hydro operator in Värmland, Fortum, and how the CAB has argued for their decision in the applications. The result will show the operator if their impression of the decision-making process is correct and needs to be addressed. In turn, the CAB will shortly be able to describe how they see the situation.

Problem statement: The hydro operators in Värmland indicate that the hydro power plant permit application decisions are based on opinions rather than facts.

Objective: This research aims to find an indication whether opinions are affecting decision-making of hydro operations permit applications at the CAB in Värmland.

The main research question is "*How is the social aspect included in the decision making at the CAB in Värmland?*". For a more tangible result the study has been limited to cases provided by Fortum Sweden and to the county of Värmland, as Fortum has 38 power plants and several dams in Värmland. The limitations are discussed further in chapter 4.2.

This chapter assess the background information relevant to understanding the research problem and the reasons why this study has been executed. There will be a short presentation of the democratic system in Sweden and different authorities relevant to the topic, followed by an explanation of the county of Värmland. This chapter will also give a short review on hydro power plants environmental impact and the company Fortum and their sustainability.

2.1 The Swedish democratic system

Sweden is a democracy and a constitutional monarchy. The parliament consist of 349 elected individuals out of which the government is created (Regeringskansliet, 2018). The government consist of the prime minister and 22 ministers (Regeringskansliet, 2018). The parliament election is held every fourth year and the next election will be held in the autumn of 2018. The main task of these forces is to protect the citizens and their belongings from external threats. This takes shape as regulations of laws. As Sweden is a member of the European Union (EU), the government is obligated to follow the guidelines and legislation decided within EU (Regeringskansliet, 2018).

To minimize the possibilities of corruption and improper use of power, the decision-making body of Sweden has been divided into three layers: the state, the regional, and the local. These layers are in constant cooperation to achieve best standards in Sweden (Länsstyrelsen Västra Götaland, 2016). The state level consists of the Parliament and government, the judiciary, and their agencies or authorities. The regional level consists of country councils and counties. Country councils have the same geographical area as the counties and are primarily in charge of health services in the region. The local level consists of municipalities (Figure 1).

Sweden is divided into 21 counties and the counties are further divided into a total of 290 municipalities. Municipalities may in some cases also be large cities, such as Stockholm or Gothenburg (Länsstyrelsen Västra Götaland, 2016). Even though the country council belong to the regional level with counties, they have little in common. The country council may gather their own taxation and uphold a political agenda, while the counties may not as they are under government ruling. (Figure 1).

A Parliament chosen governor (*swe.* landshövding) is leading the counties and the main task for the county is to turn laws into practice for the local population and to manage tasks which are not separately extended to another authority. The counties monitor the development of the county and report everything of significance to the parliament. The county is delivering the concerns and thoughts of the citizens to the parliament. (Länsstyrelsen Västra Götaland, 2016)

SWEDISH DEMOCRATIC SYSTEM

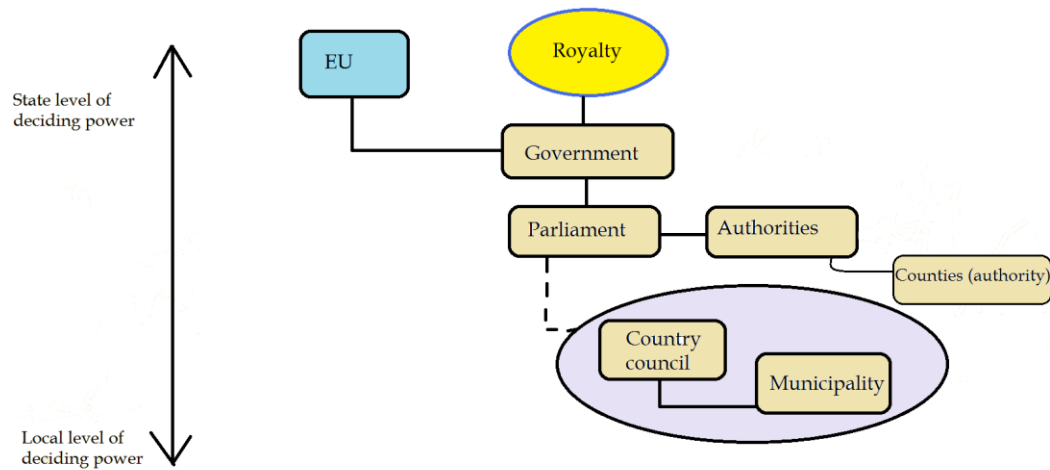


Figure 1. This figure illustrates the democratic system in Sweden. The head of the state is the Royal family, which during 2018 is led by King Carl XVI Gustaf. The government answers to the king and the parliament of EU. The Parliament of Sweden answers to the government, as do the governmental authorities such as the counties. The country councils and the municipalities may uphold their own politics. To illustrate this difference, they are separated into their own bubble, visualized with the color pink. (Västra Götalands länsstyrelse, 2016)

There are many separate authorities in Sweden that works with the guidelines of the parliament. Interesting for this specific study are the authorities of Havs- och vattenmyndigheten (HaV), Naturvårdsverket, and Vattenmyndigheterna. All of these authorities are working for a better physical well-being of the waterbodies in Sweden. Naturvårdsverket are working for a general goal of a better environment, whilst HaV strives to improve the well-being of both sea and lake systems in Sweden. Vattenmyndigheterna is the overall authority whom suggest actions for other authorities how to improve the status of waterbodies. Vattenmyndigheterna does also suggest cooperation possibilities between the authorities to increase the possibility of success. (Vattenmyndigheterna, 2014)

Vattenmyndigheterna (2014) has published a protocol for authorities and municipalities on how to improve the status of Swedish water bodies. The protocol points out what the authorities should focus on, and which other organization to lean on for help and cooperation. The protocol is designed to help Sweden reach their environmental goals by suggesting practical solutions to legal requirements. The authorities have a shared responsibility to reach the goals.

The county administrative boards are responsible with HaV, to decrease the environmental effects of dams and hydro power plants in line with what Vattenmyndigheterna proposes. The actions proposed by Vattenmyndigheterna

for the counties start off with requiring a wider supervision of environmentally dangerous operations in compliance with chapters 9 and 11 in the environmental code. The supervision should target operators which are, or might, counteract the possibility for a water body to reach good ecological status. Secondly, the counties should supervise and suggest requirements for hydro power plants and dams to increase the possibility of the affected water body to reach good ecological status. Dams and power plants create "obstacles" in the water body, which makes it nearly impossible for the water body to reach good ecological status. Flora and fauna does not have a possibility to freely flourish and uphold a local eco system because of these "obstacles". Vattenmyndigheterna mention that they realize the conflicts in the suggested actions and stresses the importance of cooperation between authorities to achieve best results.

2.2 Värmland county

Värmland is a county in western Sweden (Figure 2) with a total size of 18 204 km² and a population size of approximately 320 000 (Svenska Kungahuset, 2018). Prince Philip and his wife Princess Sofia are the duke and duchess of Värmland. Värmland county was established in 1776 when it separated from Örebro county (Länsstyrelserna, 2018). The name "Värmland" is thought to descend from the word Värma or Värmeln which means simmering waters. Värmland county consists of 16 municipalities (Länsstyrelserna, 2018). Out of these 16 municipalities Arvika, Forshaga, Kil, and Torsby are interesting for the thesis. The city of Karlstad is the largest city in the county and the population of the city is 87 800 citizens.

The county of Värmland is known for its beautiful environment and closeness to nature (Länsstyrelserna, 2018). Waterbodies are seemingly important for the county as it hosts 6000 lakes connected through 10 000 km of water passages (Länsstyrelserna, 2018). One of the lakes in Värmland is the lake Vänern, which is the largest lake in Sweden. Vänern is an important lake as it has a great biodiversity and offers many recreational activities such as fishing and boating.

The main river in Värmland, Klar river, extends from the Norwegian border to the northern parts of lake Vänern and descends from the lake in the south into the Western sea as Göta river. The Klar river is strongly regulated by hydro operations and has been for a long time (Kuhlin, 2018). The dams and power plants in the Klar river are mostly run-of-river types, except Höljes power plant which is a storage type (See 2.3).

The county administrative board (CAB) of Värmland is an authority in the Swedish democratic system ruling over the area of Värmland. They are obliged to follow the guidelines of the government, and to report about developments in the

area to the government. The county administrative board act as an institution in charge of improving the county overall (Länsstyrelsen Västra Götaland, 2016).

Annually the government send out an appropriator letter, which indicates how the government wishes that the CAB are distributing their budget over certain main missions (Sveriges Regering, 2017). The missions of the counties are to defend the culture, environment, human rights, industry development, employment development, integration of refugees, fighting terrorism in the county etc. The CAB is then required to report about their decisions regarding the main missions mentioned in the appropriator letter if annually. The report is supposed to show the government of Sweden how the legislation is implemented in the counties (Sveriges Regering, 2017).

On a local level this is seen as allowing permits or funding for different projects. Permit applications can be building houses, expanding energy production, starting a new business, or reparation of farm houses and so on. Permits admitted by the CAB is how the national legislation is turned into practice on a local level.

Sustainability in Värmland

One of the main missions in the appropriator letter is the importance of decreasing carbon emission and increasing climate well-being. To monitor this main mission, Värmland county has created an energy and climate strategy. The strategy was formed during 2008 by a county administered environmental committee, as required in that year's appropriator letter. The strategy will be updated in 2018.

The vision created by the committee was "*Värmland is a climate smart county with sustainable and effective energy systems, and intelligent logistics.*" (Länsstyrelsen Värmland, 2013) This indicates that Värmland is working to increase the share of renewable energy produced and used within the county and to increase efficiency in energy use. Värmland county is working to increase efficiency in logistics, transport, households, and business, as a strategic goal to decrease the ecological footprint.

The strategy was divided into six parts: transport, industry, agriculture, consumption, energy peaks, and production of energy with renewables (Länsstyrelsen Värmland, 2013). The three first parts are mainly focusing on decreasing their emissions as they are the most polluting aspects of the county. Consumption and energy peaks are considered to have indirect emission and should be decreased where possible. Lastly, to improve the overall sustainability, the county wants to increase energy production with sustainable sources. Värmland county specifies even further that with their sustainability goals for energy production they want the production to be regulated according to modern legislation, in line the environmental code of Sweden, and being financially competitive. (Länsstyrelsen Värmland, 2013)

Hydro power is considered by the CAB to have been utilized to its fullest in Värmland. Increasing production of hydro power would mainly be as a result of modernization of existing power plants. Modernizations allow increased efficiency, production, and safety at the power plants. Though, as the county want to improve their sustainability they suggest that instead of increasing production with hydro power, they could increase the environmental sustainability of the operations instead (Länsstyrelsen Värmland, 2013).

The sustainability strategy assesses different possibilities of increasing renewable energy production in the county, as a way to decrease the carbon footprint (Länsstyrelsen Värmland, 2013). They mention that the renewable energy production should focus on the possibilities found within county, such as water, wind, and biomass. The county of Värmland strives to reach their goals as soon as possible and acknowledge that they start the process by "picking low hanging fruit" indicating that they will modify and build power plants that are the easiest to modify. (Länsstyrelsen Värmland, 2013)

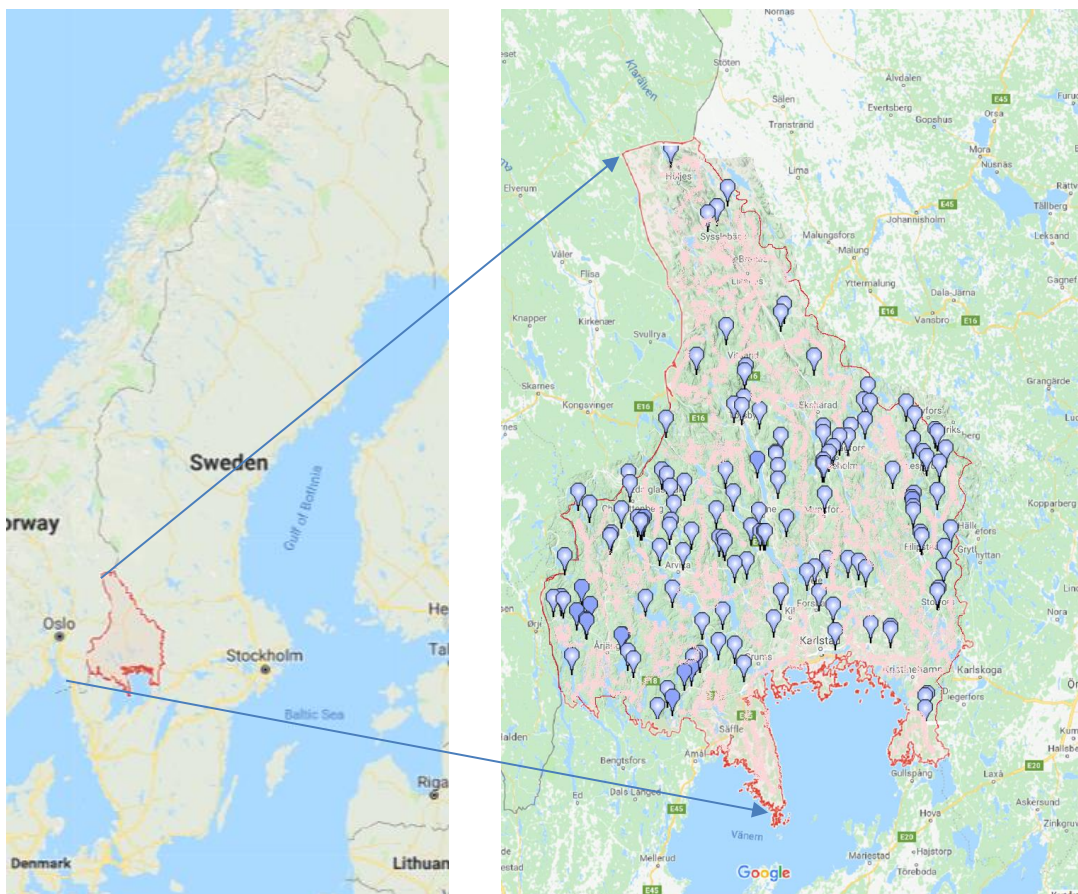


Figure 2: Värmland lies in the western parts of Sweden, on the border to Norway (on the left). The pins in the right side picture show where all of hydro power operations are located in the county of Värmland. Picture retrieved from Google and the locations of hydro power plants from www.vattenkraft.info (Kuhlin, 2018)

2.3 Hydro power plants

Hydro power is one of the main renewable energy sources as it is a clean form of energy (Karier & Fazio, 2017). The downside of renewable energy is their physical effect on the local nature in land use, effect on local ecology, noise and shaping of landscapes. Hydro can be determined clean on three characteristics (Karier & Fazio, 2017): free from emissions, low-cost resource, and high storage value. The two first characteristics are relevant for other renewable energy sources as well, as they utilize unlimited natural resources.

Karier & Fazio (2017) emphasizes the importance of the third characteristic for hydro power: storage value. Its functions are similar to the functions of a battery, but is limited by liabilities such as flood control, irrigation, and water levels. In a blogpost for Fortum, Tatu Kulla (2018) compared the storage power of a hydropower system to the storage power of the most effective battery on the market. The comparison showed that to replace a large hydropower system with batteries over 300 000 pieces would be necessary. That would approximately cost 150 billion Euros, which is two times more than the annual budget for Finland (Kulla, 2018). The comparison shows the massive benefit of storage value in hydro power.

Hydro power utilizes the potential energy stored in water by allowing it to flow from higher altitudes to lower through a turbine (Figure 3) (U.S Department of Energy, 2018). The running water will then create motion in turbine which is generated into electricity. In compliance with the first law of thermodynamics the potential energy changes form to kinetic energy which will change form into electricity in the generator. Kinetic and electrical energy are after sought forms of energy, as they can easily convert into other forms of energy with minimal energy losses (Wagner & Mathur, 2011). To ensure a steady flow of water, dams are placed along the hydro operations system. Dams control how much flow of the water is in the river system. If the lake created by a dam is threatening to rise, the dam releases water through its spillways (McCully, 2001).

Power plants can be classified according to construction, turbine, water body, and size. This because power plants must be fitted into the water body they are placed in, to maximize the energy production on the terms of the environment (Wagner & Mathur, 2011). The most usual form of power plants are run-of-river or storage power plants. Run-of-river power plants are located in the river and are utilizing the natural flow of the water. Some of these power plants uses a diversion channel for their power plants. A diversion channel indicates that the power plant is fed by a limited amount of water in a separate channel from the main flow from the river and are therefore mostly small-scale power plants (Wagner & Mathur, 2011). Run-of-river power plants have a small storage to uphold the water level in the river for recreational purposes and as a safety net, in case of an unexpected

event such as temporary high demand on electricity or unusual dry weather (Wagner & Mathur, 2011).

Storage power plants rely on dams, creating a high pressure at the turbine, and thus have greater potential for electricity production. Storage power plants may or may not have a natural flow of water and are assessed according to the need of pumping water into the dam (Wagner & Mathur, 2011). As the name suggests the dam "stores" energy and allows better control of production than run-of-river power plants.

The environmental impact of run-of-river plants are rather small and does not modify living conditions for the community. That includes that the natural habitat in and around the water is also preserved, as the water flow is preserved. In a storage plant the environmental impact is more visual, as the water levels are modified and will affect natural habitats (Atilgan & Azapagic, 2016). Though, Atilgan & Azapagic (2016) argue in their study that the ecosystem of large and small-scale storage power plants have a smaller impact on the water body health than run-of-river power plants. Based on the presented arguments, the environmental impact of a power plants should be studied separately and in relation to cultural and economic factors, for best assessment of true environmental impact. The largest environmental impact of hydro power plants is during construction. Though, theoretically according to Atilgan & Azapagic (2016), up to 40% of the impact can be reduced if the power plant can be recycled at the end of its lifetime.

River systems are usually connected by different smaller river systems flowing in the same direction which eventually ends up in the same lake or the sea (Internal Experts, 2018). This complex system of rivers and lakes allows hydro power operators to utilize dams in rivers without power plants to monitor the water level if needed. The need and use of these pure regulative dams outside of the "main" river is constantly assessed. If they serve no purpose for the energy operator or other organization, they are most likely demolished in favor for the environment (Internal Experts, 2018).

A dam varies greatly in size, depending on the size of the reservoir it upholds. A small dam might only be a few meters wide whilst the largest dams are over a kilometer (Kuhlin, 2018). Regardless of size, a dam is usually structured with buttresses and spillways. Buttresses are construction parts connected to the land, whilst spillways control the water level by "spilling out" water when needed. Dams are classified according to their structure (Kuhlin, 2018).

"Skewer" dams are built with wooden logs operated manually by removing or adding logs according to wished level of water. Operating such a dam is rather slow and suitable for low maintenance rivers. Plain hatches can be operated with a hydraulic press or manually by lifting up the hatch to let out water. Plain hatches are more suitable for faster regulations. These dam types might come in different shapes but act rather similarly. (Internal Experts, 2018)

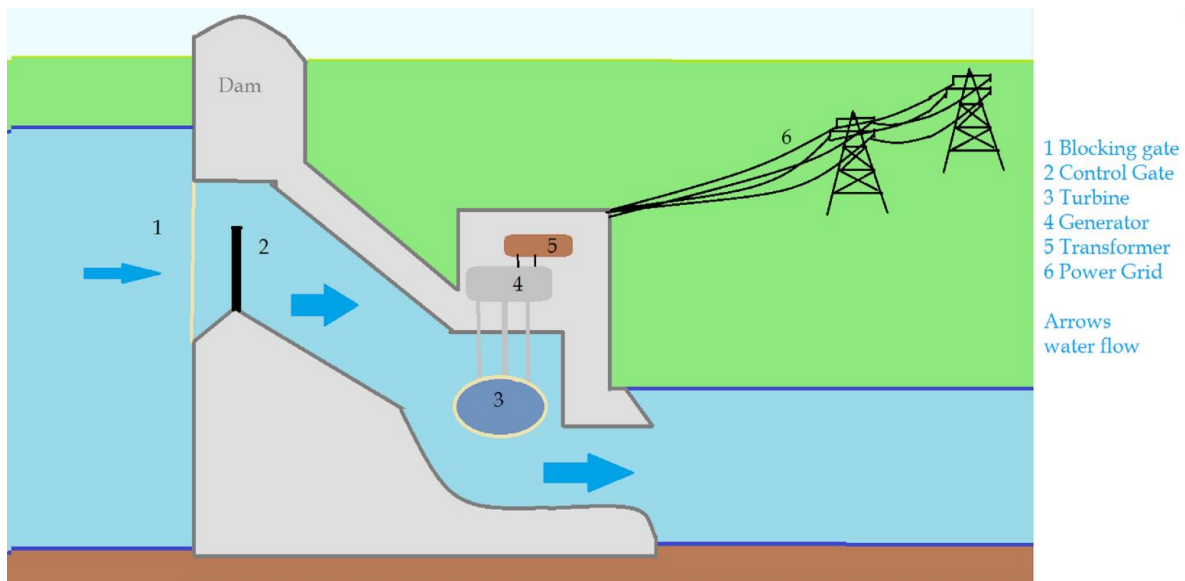


Figure 3: A simplified picture of a hydro power plant. The six most important part of the power plant are 1. Blocking gate, 2. Control Gate, 3. Turbine, 4. Generator, 5. Transformer, and 6 Power Grid. The blue arrows indicate the flowing direction of the water.

2.4 Fortum

Fortum Heat and Power Oyj, also called Fortum Oyj, is a global energy company with a strong focus on production of sustainable energy. Fortum produces energy and heat with several fuel alternatives, constantly striving to find greener substitutes. Fortums vision is a cleaner world (Fortum, 2017), and their missions are designed to support Fortum to reach the vision. The code of conduct states that their mission is to engage stakeholders and accelerate the change towards sustainability. Their strategy is created in relation to megatrends such as urbanization, digitalization, and resource efficiency. To meet these demands, Fortum strives to study how energy is used and shape the production accordingly.

Fortum Oyj was established in 1998 when Imatran Voima (IVO) and Neste Oyj adjoined into one corporation (Zimin, 2012; Neste, 2017). IVO was established in 1921 and soon grew into the one of the largest energy produces in Finland (Zimin, 2012). During the 1990s IVO started to expand internationally to Russia, Sweden, and Great -Britain. Vuorinen (2015) states that the expansion to Sweden has been the most significant one as IVO purchased a lot of hydro and nuclear power for a convenient price.

Neste was established to secure the oil production in Finland in 1948. The fuse of IVO and Neste was defined as a way for Finland to compete on global markets with one strong company (Zimin, 2012). Though in 2005, the oil industry

separated from the energy industry and Neste Oil Oyj was re-created (Vuorinen, 2015; Neste, 2017). After the separation Fortum became specialized in energy products and services and kept its strong position on the markets (Vuorinen, 2015). Today Fortum is located in several locations but is mostly concentrated in Europe. Fortum Sweden is a subsidiary of Fortum Oyj, which handles the business operations of Sweden and Norway.

Fortum owns both run-of-river and storage power plants in Sweden (Fortum, 2018, b; Internal Experts, 2018). The choice to build these types of power plants were made by the previous owner of the power plants and were most likely based on the structure of the river and the reason for building the power plant, e.g. an industry nearby. Most of the dams and hydro power plants owned by Fortum have been obtained through company purchases (Internal Experts, 2018). Fortum utilizes mostly plan hatches for power plants and "skewer" dams for smaller lakes.

2.4.1 Sustainability at Fortum

Fortum publishes a sustainability report annually to communicate about their actions with stakeholders. The report is published in English and Finnish. Sustainability reporting is a concrete way to present how the company regards its social responsibility. Corporate social responsibility (CSR) have many different definitions and therefore, as a way to unify the general discussion regarding CSR, the Commission of EU has defined CSR as: *companies taking responsibility for their impact on society* (EU Commission, 2018; Öberseder, 2013; Lin-Hi & Müller, 2013). CSR should be integrated in the strategic values of the corporations for it to be successful as it otherwise loses value (Lin-Hi & Müller, 2013). Fortum has integrated the triple bottom line as a foundation of their sustainability incorporated with eight (8) of the sustainability development goals (SDG) presented by the United Nations (UN) in 2015 (Fortum, 2018, a).

Climate action and clean energy is the core of Fortum's operations as the share of CO₂ free energy is up to 61% of the whole production and 96% of the production in Europe, of which 30% was generated with renewable sources (Fortum, 2018, a). The trend is growing stronger each year, as the emissions are decreasing, and the share of renewable energy is increasing. Currently Fortum utilizes eight different fuels resources for energy production and seven for heat.

Fortum mentions their commitment to corporate citizenship and their coexistence with the community as a part of their sustainability strategy (Fortum, 2018, a). Corporate citizenship is seen to be derived from CSR as a separate political viewpoint of the social responsibility of companies (Tempels, 2017). Companies are engaging in the thinking of corporate citizenship as way of expanding CSR work by adapting for example the SDGs. That way companies may increase value for society and engage in political discussion from both a social and an economic point of view (Tempels, 2017; Pies, 2018). In practicality corporate

citizenship may be seen as a way of companies to "act as a citizen" in the society by contributing to its well-being.

Corporate citizenship is a suitable way to explain stakeholder management on a local level. Especially for hydro power plant areas, where the water bodies will change and affect fishing, boating, and other recreational and cultural values. It is vital for corporations to maintain a good relationship with the communities and to minimize their environmental impact through collaboration.

2.5 Conclusion of chapter 2

The aim of this chapter was to increase background knowledge to better understand how the research problem has developed and why. The county is an authority in the democratic system in Sweden and is hence responsible to act accordingly. This indicates a neutral approach to any problem appearing for them. The CAB is given several main missions by the government. Out of these main mission the environmental aspect is one of the most important. It is important to follow the environmental strategy within the county to reach both the local and national sustainability goals. A local strategy should reflect the national goals, to minimize the possibility of unnecessary attempts. Sweden's energy production should be modified during the coming decades to reach the 2040 goal of no fossil fuel. That indicates that the counties in Sweden must separately strive to increase the amount of green energy, so that the national total production meets the goal by 2040.

Fortum Sweden is a major contributor to the Swedish energy production. The presentation of Fortum and their sustainability showed that some part of the strategies are in line with each other, and both Fortum, Sweden, and the county of Värmland are willing to increase the production of renewable energy. This study approaches the renewable energy source of hydro power, as it has a long history in Sweden and Fortum owns many hydro power plants in Värmland. This combination allows a better chance of finding relevant cases for the study.

This study focuses on permit applications of a major hydro operator in Värmland, Fortum, and how the CAB has argued for their decision in the applications. The result will show the operator if their impression of the decision-making process is correct and needs to be addressed. In turn, the CAB will shortly be able to describe how they see the situation. This study aims to find an indication to whether opinions are affecting the decision-making at the CAB in Värmland.

3 LITERATURE REVIEW

This chapter introduces relevant literature for the presented research problem. Literature reviewed for the study includes social license to operate (SLO) and social impact assessment (SIA). These theories address how social gaps are created and what underlying problem there might be for social conflicts and how they should be addressed. A difference in local and national opposition can be defined as a social gap, which is why these theories have been chosen for this specific study.

The literature strives to shed light on how and what the county could do to increase their knowledge of local opinions and how to include them in the decision-making process. These theories reflect on how government, locals, and companies interact when planning a certain project and during operation. The literature is written from a corporation viewpoint and is included in this thesis to highlight how the governmental institutions may affect how the companies obtain a SLO.

The literature was gathered from the University library website and the databases available for students at Jyväskylä University. Several articles were analysed for their relevancy of the topic. For SLO 26 articles were read and analysed, out of which 19 were assessed relevant. Out of these 19 articles, eight (8) were used. SIA literature review was more compact with 7 relevant articles, out of which four (4) was used. The stakeholder management literature review assessed 5 relevant out of 10 possible. Four (4) of these were used for the literature review. Articles were discarded by including information irrelevant within the research design of the study, perspective of the article was outside the scope of the thesis, and for repetition of information already found in other articles.

3.1 Social license to operate

Social license to operate (SLO) have developed as a way for companies to assess their acceptability in society in regard to their actions (Prno & Slocombe, 2012; Prno, 2013; Smits, van Leeuwen, & van Tatenhove, 2017; Moffat & Zhang, 2014). SLO was created for the extractive industry but has now also found ground in other industries. It was introduced in the 1990's by Jim Cooney, a mining executive from Canada (Prno, 2013; Moffat & Zhang, 2014). As societies have become more aware of the negative impact of company actions, they have started to demand that these actions are somehow addressed and corrected.

The change in societies have also affected the engagement of different stakeholders. Existing governance structures allow local people to affect the outcomes of the political decision in a larger content than before. It has also been mentioned that the growing environmental awareness amongst local population has decreased their satisfaction of a fully legal compliance of environmental work for companies (Prno & Slocombe, 2012; Smits, van Leeuwen, & van Tatenhove, 2017). This indicates that local populations are requiring more from the companies than legally required. SLO has been seen as a guideline for how to address a situation working for social sustainability improvements (Prno, 2013).

SLO is an intangible asset as there is no official license given. Demuijnck and Fasterling (2016) addresses this intangibility by arguing that a social license should be seen as a way to prove the legitimacy of any public law, rather than trying to create a physical agreement. The authors argue which approach to a social contract is the most logic one to explain how business and social acceptance cooperate. They emphasize the importance of consent on both parts but mention simultaneously that an agreement between two parties is not a proof of consent. This can be described further as a result on a conflict mediation, were the result is an agreement based on compromises from both sides. The lack of consent does not remove the SLO, in case the dialogue has been transparent and allowed everybody express their concerns (Demuijnck & Fasterling, 2016).

One can state that a SLO exists when a project is seen to have obtained acceptance and approval for actions by the society they are active in. Therefore, SLO is also context-specific, as the approval of a project reflects the values of the community and their sustainability conditions (Prno, 2013; Prno & Slocombe, 2012). The SLO will then include the expectation's and needs of the specific community. Smits, Leewuen, and van Tatenhove (2017) describes further that the fundamental principles of SLO is legitimacy and trust. Trust can be given to both individuals or organizations, but in the context of SLO the most important trust might be based on competence. The community must uphold a trust in the competence of both the legal framework and company planning that they strive for

the best of the community (Smits, van Leeuwen, & van Tatenhove, 2017; Moffat & Zhang, 2014).

SLO is also defined according to other aspects than context. In an extensive analysis Prno (2013) found that a SLO is also built on meaningful relationships, sustainability as the main concern for the community, shared benefits for the locals, and that adaptability is crucial for the success of a SLO. These aspects show that there are no generalizations of SLO, as every community is different. Simultaneously, the aspects show that the SLO is an ongoing process. Values, needs, and expectations may change during the operation of a project and the SLO must show adaptability to reflect the changes in the community (Smits, van Leeuwen, & van Tatenhove, 2017).

Several authors have mentioned tangible ways of obtaining a SLO. These actions include active communication and engagement with the community, transparent sharing of information and successful conflict mediation. Prno & Slocombe (2012), Gehman et al. (2017), and Smits, Leeuwen, and van Tatenhove (2017) argue that even though all those actions are vital for a successful integration in the community, it would serve better for company to improve their legitimacy and credibility to increase trust. The corporate culture should be visible for the community and reflect their values, an understanding of their culture, history and language will also increase the probability of obtaining a SLO. Basically, the SLO stems from how well the company has socially integrated with the community.

A change in society has led to a shift in governance. The line between government and society has blurred as individuals, NGO's, and lobbyist's may affect political outcomes (Prno & Slocombe, 2012). The effects of this shift have allowed SLO to emerge, as it allows otherwise easily out drowned groups to express their voice and concerns. Despite a shift in societal governance structures, the importance of governmental institutions remains. Institutions are usually operating together to achieve the best outcome (Prno & Slocombe, 2012). Governmental institutions may write permits for projects, which is the legal license of operations. The permits outline what the project may or may not do within the scope of the regulatory framework (Smits, van Leeuwen, & van Tatenhove, 2017). The institutes themselves carry an important role of improving the community through legal framework, as they have the power to allow or revoke permits.

The idea of environmental governance is important for SLO. Environmental governance state that solutions to environmental issues can be found through both regulatory and non-regulatory tools (Prno & Slocombe, 2012). Environmental governance has been the best way to increase environmental compliance. Prno & Slocombe (2012) further state that there is a continuing trend of support for governmental regulation of environmental issues from the society. The blurred political structures allow decisions to be made through several inputs of opinions. This can be described as a policy network approach. Policy network approach is

designed to express how power is handled in governmental institutions and who it benefits.

A tangible approach to environmental governance of projects is environmental assessment (EA) (Prno & Slocombe, 2012). EA is designed to identify possible environmental impacts of the project, to predict the outcome of the project, and propose how the impacts are to be addressed. EA is often presented in the early stages of a project. By presenting the assessment early on, the project leaders and management may conduct changes in the preferences of expressed opinions. The involvement of stakeholders in the EA stage has allowed a more transparent and trustworthy approach to projects, increasing the trust and communication between community and company, and therefore also improving a SLO situation. (Prno & Slocombe, 2012)

Projects will not only affect the environment, but also the social structure of the area. Social impact assessment (SIA) has been mentioned in the literature as a way of identifying possible impact on the social aspect of the project in the community (Moffat & Zhang, 2014; Karjalainen & Järvikoski, 2010). SIA allows companies to prepare and avoid major social issues before the project has begun. (See 3.2)

SLO can benefit everyone that are included in the process. Smits, Leeuwen, and van Tatenhove (2017) mention that a decrease in political trust may affect negatively the trust in institutionalized activities, such as permit application approvals. A SLO for a company is dependent on the local trust in both governmental institutions and the company actions, and vice versa. Simultaneously Moffat and Zhang (2014) emphasizes the importance of procedural fairness. They argue that the quality of the engagement is more valuable than the quantity, as the quality of a discussion reflects an overall approval. Moffat and Zhang (2014) also mention that some groups or individuals are careful with engaging in discussion with companies. It would be most necessary for the companies and authorities to emphasize the importance of their engagement, so that the possibility of a continuous SLO is upheld. Therefore, SLO serves as a balance board to increase trust between all actors but may not be used as an excuse for "not-in-my-backyard" actions (Demuijnck & Festerling, 2016).

Gehman, Lefsrud, and Fast (2017) have compiled research regarding SLO and designed three models which could describe SLO. These models are the pyramid, three-strand model, and the triangle (Figure 4). The pyramid model bases SLO on three aspects legitimacy, credibility, and trust. They further distinguish the difference of these aspects as legitimacy is required for acceptance, whilst trust and credibility upgrade the acceptance to approval. The pyramid model sees the aspects as ways to distinguish how the locals perceive the project. Legitimacy distinguishes rejected projects from accepted ones, credibility approved from accepted, and lastly trust will separate identifiable from approved projects. The identifiable level indicates that the project can be identified with the community.

The three-strand model sees SLO as a part of a framework. The three strands are legal, social, and economic licenses which create the framework. The legal strand is represented by national and international laws, the economic which also can be called political represents the government and politicians. The social strand consist of NGO's, community and media. The three-strand model shows how the strands are communicating outside the activity. This model explains thus why some companies do more than what is legally required from them. This because there is a constant change possible within the framework of the three-strand model when all strands are in constant communication. These licenses introduced in the three-strand model cooperate to explain the proposed activity. It also strives to explain how these different strands promote the activity (Gehman, Lefsrud, & Fast, 2017).

Lastly, Gehman, Lefstrud, and Fast (2017) describe the triangle model. The triangle model was created to answer the social aspect of renewable energy policies in the 1980's. The triangle model consists of three dimensions: socio-political-, community-, and market acceptance. Sociopolitical acceptance refers to the general acceptance including policymakers and policies, key stakeholders such as employees, and technologies. Community acceptance considers the local acceptance of the siting. Community acceptance can be described as the acceptance of local authorities, residents, and other local stakeholders. Market acceptance indicates the adoption of a new innovation. Gehman, Lefstrud, and Fast (2017) argue further that the market acceptance is what makes the triangle model suitable for renewable energy industries. Renewable energy consists of constructions which are activating different stakeholders simultaneously.

The triangle model considers social license to be a result of an acceptance process. Policy makers require a social support to overcome conventional systems, such as fossil fuels. They highlighted the social acceptance as the most powerful obstacle for implementation of renewable energy targets. Gehman, Lefstrud, and Fast (2017) mentions that the social gap and social license are closely related as they both emphasize the importance of legitimacy, which in this case is defined as when stakeholders support and approve of an organization's activities (Gehman, Lefsrud, & Fast, 2017).

The term SLO has not received any major attention in the renewable energy sector, as they mostly assess the social problem from a "not-in-my-backyard" or NIMBY viewpoint. This because renewable projects usually receive a sociopolitical acceptance and market acceptance but lack the community acceptance. The differentiation in sociopolitical and community acceptance can also be described as a social gap (Gehman, Lefsrud, & Fast, 2017). NIMBY as a theory tries to explain where the gap is created and why. van der Horst (2007) argues in his article that NIMBY actions are excluding passive voices and that the success of the opposing force is reliant on their knowledge of the political process and the application process of the opposed matter.

As an industry is placed near a neighborhood it is not only the landscape that will change and affect the opinions. It will also affect the sense of safety and concern of environmental impact. These other aspects of concern are most likely to affect the negative approach rather than just not wanting it close by. Research has shown that areas which already have or have had heavy industry are more prone to "accept" new industries in their premises (van der Horst, 2007). These locals are used to the impact of the industries and are therefore less active in opposing new industry (Owen & Kemp, 2013). Similarly, it has been shown for the energy industry in Finland that individuals near existing industries are more accepting of the industries than individuals living far away from the industries (Energiateollisuus, 2017).

Petrova (2016) introduces in her study that instead of NIMBY one should consider VESPA (visual/landscape, environmental, socioeconomically, and procedural) as a way to organize community concerns. A grouping of which topics are mostly related, can also give the organization a better chance to address the social gap created by the differentiation in opinions. A grouping of topics allows the policymakers and decision makers at organizations to see which aspects that create most disturbance amongst locals. With this information it is easier to engage in discussions as the concerns are known. It is important to notice that as the impacts are local to the project, the benefits of the project should also be local. This indicates that when engaging with local stakeholders it is necessary to stress the benefits for the community rather than global (Petrova, 2016).

SLO has been utilized in several industries as a way to describe a company's continuous stakeholder engagement and the quality of the engagement. Smits, Leeuwen, and van Tatenhove (2017) mentions in their article that SLO should also be considered for the governmental institutions, as they are a part of the SLO structure and their relation with the company or organization proposing a project can affect the SLO the company holds. Simultaneously, they are the organization that upholds the legal aspects of everything that happens within their district.

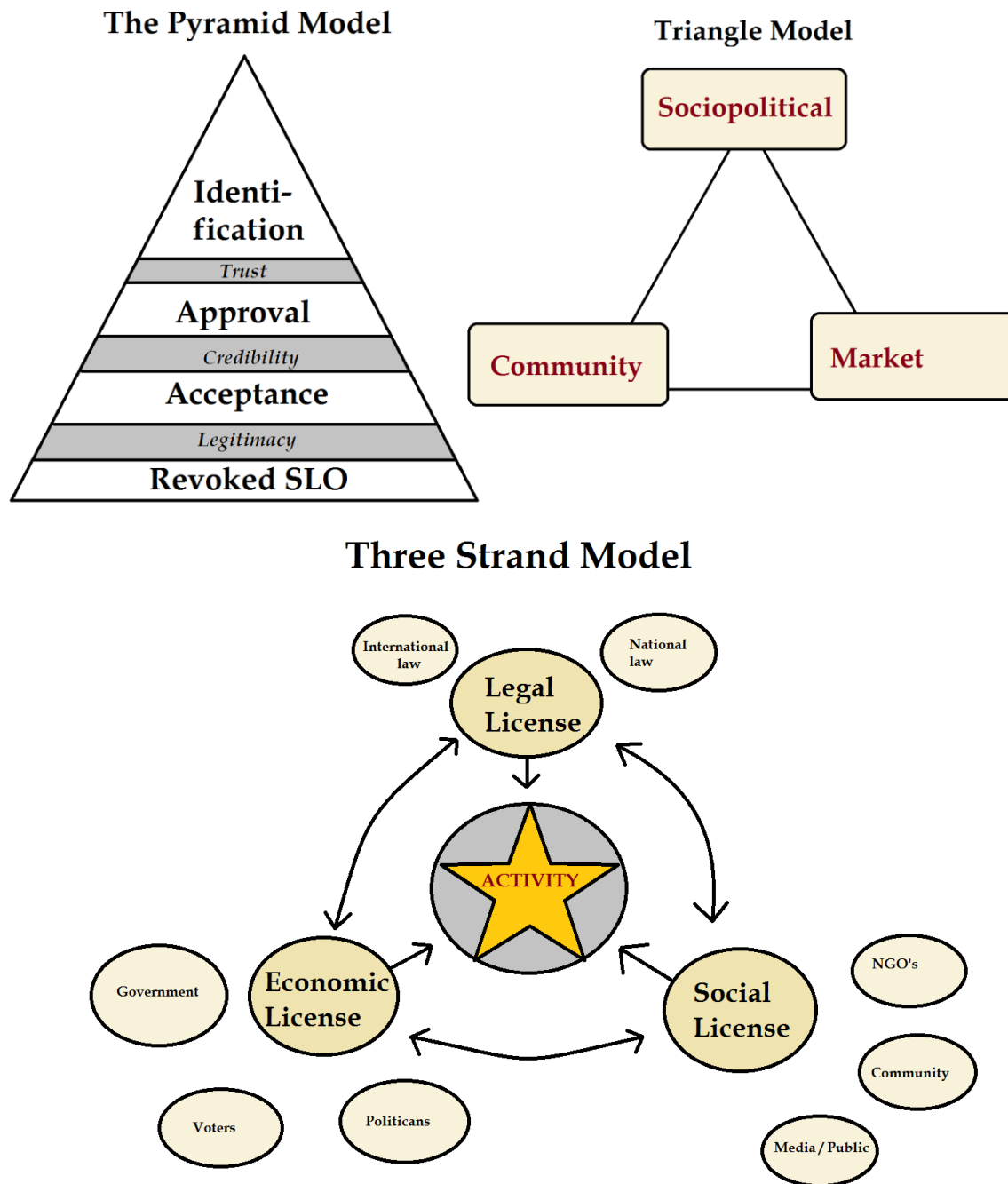


Figure 4: The three different models of SLO as presented by Gehman, Lefstrud, and Fast (2017). The figure visualizes the relation between action and important aspects. The pyramid model suggests that legitimacy, credibility and trust are stepping stones to climb the pyramid up until the community and corporation can be identified in each other. The triangle and three-strand model try to emphasize how different acceptances or licenses are related to the proposed activity. The three-strand model shows separately how the license are each modified according to own external pressures. Picture created by Nieminen (2018) based on Gehman, Lefstrud, and Fast (2017) pictures found in their article.

3.2 Social impact assessment

SIA is a proposed additive for the EAs to include the social aspect when conducting project impact assessments. Tilt, Braun, and He (2009) argue that projects with large environmental impacts will affect the social structure of the area as well, which is why the social impact should be assessed with the EA.

SIA is similar to the SLO in the sense that it should be viewed as a process rather than a management tool (Karjalainen & Järvikoski, 2010). Though, the focus of SIA lies on identifying, managing, and monitoring anticipated and unintentional social consequences before a project, so that social conflict may be avoided (Karjalainen & Järvikoski, 2010). The social consequences are usually different forms of social conflicts in values or interests. Basically SIA is used for improving conflict management (Barrow, 2010).

SIA aims to predict possible social conflicts that may surface in large projects and to assess the social impact the project may bring for possible recreational use, changes in households and employment possibilities, access to use natural resources, and changes in social networks and communities (Tilt, Braun, & He, 2009; Peltonen & Sairinen, 2010; Barrow, 2010). If a project is deemed to affect some of these aspects or a similar social aspect, it is crucial to know how the community reacts to the change. Both Karjalainen & Järvikoski (2010) and Tilt, Braun, & He (2009) underlies the importance of engaging stakeholders early on in the planning process and to emphasize the importance of social aspects in sustainability issues. The social aspect is not considered enough in the environmental impact assessment for projects, which has led to social conflicts. The earlier stakeholders are involved in planning, the more likely a conflict can be avoided (Barrow, 2010).

Conflicts are usually set in courts or through negotiation and mediation (Peltonen & Sairinen, 2010). Administrative approach to resolving disputes has been deemed costly and tiresome, as the processes are long. Simultaneously, an administrative approach to conflict solving has been deemed less effective for opinions to be taken in consideration and it is difficult to reach a win-win situation. Therefore, Peltonen and Sairinen (2010) mention the alternative dispute resolution theory, which aims to find alternative ways of reaching solutions and that only if no agreement can be met through negotiation, should the case be settled by an administrative force such as a court. The most attractive form of negotiation is mentioned to be mediation. Mediation allows the involvement of those most affected and it is both time and cost efficient. Mediation allows simultaneously a possibility for the corporation to build relationships with local interests and to improve their corporate citizenship. It is important to maintain the relationship afterwards and to memorize the concerns expressed for future projects.

A mediation process starts with a conflict assessment (Peltonen & Sairinen, 2010). A mediator is mapping the situation at the local area and collecting

information regarding their opinions and concerns. The main object of mapping conflicts is to find out whether a platform for negotiation exist or not. A platform can exist if there is a willingness to engage in communication with the project leader, there are resources for the mediation process, a pressure to perform the mediation, and the power structure is in balance. Otherwise, finding a solution through mediation will be as tiresome and expensive as a court session without finding a solution that all parties agree on. (Peltonen & Sairinen, 2010)

Stakeholder engagement is mostly viewed as a positive add for a project, but its success must be assessed thoroughly. Karjalainen and Järvikoski (2010) mention that all stakeholder engagement actions are not successful as it might be questioned whether they transparently represent the locals, or if too many parties are involved, a decision may never be reached that is everybody in favor. Simultaneously, both Karjalainen and Järvikoski (2010) and Tilt, Braun, and He (2009) mention that individuals involved in the process may be personally interested in the process for different reasons (cultural, social, environmental), which then influences the result. Peltonen and Sairinen (2010) mentions on the other hand that the involvement of stakeholders in the planning process enable a collective pursuing of shared values, which enables the possibility of reaching a mutual agreement.

Legitimacy and trust are important factors for a social impact assessment to be successful (Karjalainen & Järvikoski, 2010; Tilt, Braun, & He, 2009; Peltonen & Sairinen, 2010). Decisions should be made through discussions and transparent procedures. As a way to increase the legitimacy for an assessment it has been suggested that an third party approved by both stakeholders and corporation should execute the assessment. Though, as the responsibility of the assessment lies on the company it can be difficult to transparently hire a third part (Tilt, Braun, & He, 2009; Peltonen & Sairinen, 2010). Simultaneously, it is important that everyone in the process has the same knowledge and that everybody trust the knowledge at hand.

The literature for the SIA focuses a lot on the impact assessment before a project and the importance of finding possible social conflicts in order to avoid them. If SIA should be viewed as a process rather than a onetime guideline, some indications on how SIA could work as a management tool during generation or utilization of the project should be studied. SIA is supposed to analyze, monitor and manage social impacts of a project and it is important that the process continues even after the project has been approved. Social engagement is a long process and requires a lot of effort. Both SIA and SLO are processes that increase the quality of corporate citizenship.

Stakeholder engagement is seen as an inevitable part of organizational development. Literature concurs that stakeholder engagement, both internal and external, is profitable for organizations and might even create competitive advantage (Ayuso, Rodriguez, Garcia-Castro, & Ariño, 2011; Burchell & Cook,

2008). Engagement is usually different forms of interaction and dialogue with the different parties. Burchell and Cook (2008) argue that the most important aspect in communication is an open minded atmosphere without presumptions. Both parties must feel safe in the chosen environment and that information shared within the communication will not be used for wrong purposes.

This was also emphasized within the theory of SLO (See 3.1). Involved parties must feel as if they are understood and respected for a successful result of stakeholder engagement. Though, most importantly it is argued that all parties involved must feel like that they are contributing and that they benefit from the cooperation, for a positive outcome (Ayuso, Rodriguez, Garcia-Castro, & Ariño, 2011; Burchell & Cook, 2008; Reed, 2008)

Stakeholder engagement can be seen as a part of measuring the capability of the organization. There is a difference in communicating with internal stakeholders and with external. Internal stakeholders can be approached through human resources management. Good relations with internal stakeholders will allow a further development of knowledge and learning for both parties. External stakeholders on the other hand should be approached through effective communication in reporting or meetings (Ayuso, Rodriguez, Garcia-Castro, & Ariño, 2011).

3.3 Interlinking the theories

Considering the role governmental parties have in a SLO process, it is of most interest to study the models presented by Gehman, Lefstrud, and Fast (2017), to find a suitable approach to explain SLO in the scope of the thesis. The Pyramid model is not suitable for the proposed viewpoint as it assesses the SLO procedure rather linearly. There is a constant communication between several stakeholders and therefore, the pyramid model is not discussed further. The three-strand model and triangle model both view SLO as a process and can be a way to understand the relation between all parties included.

The triangle model was mentioned to have been created for the renewable energy industry in the 1980's. (Gehman, Lefsrud, & Fast, 2017) The triangle model claims that the sociopolitical aspect, community, and the market must accept the activity caused by the company before any SLO can be determined to exist. SLO has been defined as a process, intangible, and changeable. The society changes over time and then the acceptance and activity will too. For the scope of this thesis that indicates that the sociopolitical aspects consist of positive approach towards hydro power as the status of hydro power has changed in the political arena in Sweden.

The "market" acceptance in the triangle model is also described as acceptance of innovations. Hydro power is a mature innovation with market acceptance of the technology. Within the triangle method, this indicates that the market acceptance may change according to how hydro power technology is developed. The local acceptance is the most changeable, and therefore also most salient for the hydro operators. Though, hydro power is not expanding in Sweden, merely updating already existing areas. As communities have grown around the power plants, one can assume that the activity is accepted even though it is not preferred. According to this model the hydro activity should have a strong SLO and be able to impose changes to their constructions without any major backsets.

The three-strand model sees three different licenses attributing to the quality and quantity of the activity of a company. The licenses are then separately affected by other external attributes. The licenses are legal, social, and economic (political). The legal license is determined by international (EU) and national laws, legal permits, and court decisions. The legal license is strongly tangible as there is evidence for every claim made in legal documentation. The social license is according to the three-strand model created by demands of NGO's, local population, and sometimes national opinion. The social license can affect the legal license as the barriers of governance are blurred (See 3.1). Simultaneously, one could argue that for this thesis the general opinion of the company can affect the outcome of activity quality. Lastly the economic license. The economic license considers the profitability of the activity and how government and politicians value the activity.

Based on this review of literature, one can note that it would be of interest to use the three-strand model to analyze the empirical data, as it allows to look even further for possible reasons of why the activity is lagging and explanations for why the permits might be declined. The SLO for this specific study is then determined as a platform on which the three strands cooperate separately and together to improve the activity, which in this case is hydro power operations (Figure 5).

According to SIA a platform for mediation and discussion can only exist if there is a common willingness to engage in communication, there are resources to support the engagement, a pressure to perform the engagement, and the power structures is in balance. These platforms should be engaged in, to avoid court session. A mediation platform is described as a situation where all involved parties may express their own thoughts and arguments without judgment from others.

SIA further explains that mediation and engagement create better relations between all parties involved as they experience that they are being respected and listened to. This approach to seeing SLO as a platform for engaging stakeholders and creating long-lasting relationships, further show that the three-strand model is a suitable approach for SLO out of three suggested by Gehman, Lefstrud, and Fast (2017). The mediation platform approach introduced by the SIA could also help

explain why there may appear opposition from the stakeholders included in the SLO platform. SIA allows the company to find and address possible social conflicts and plan mediations to avoid them

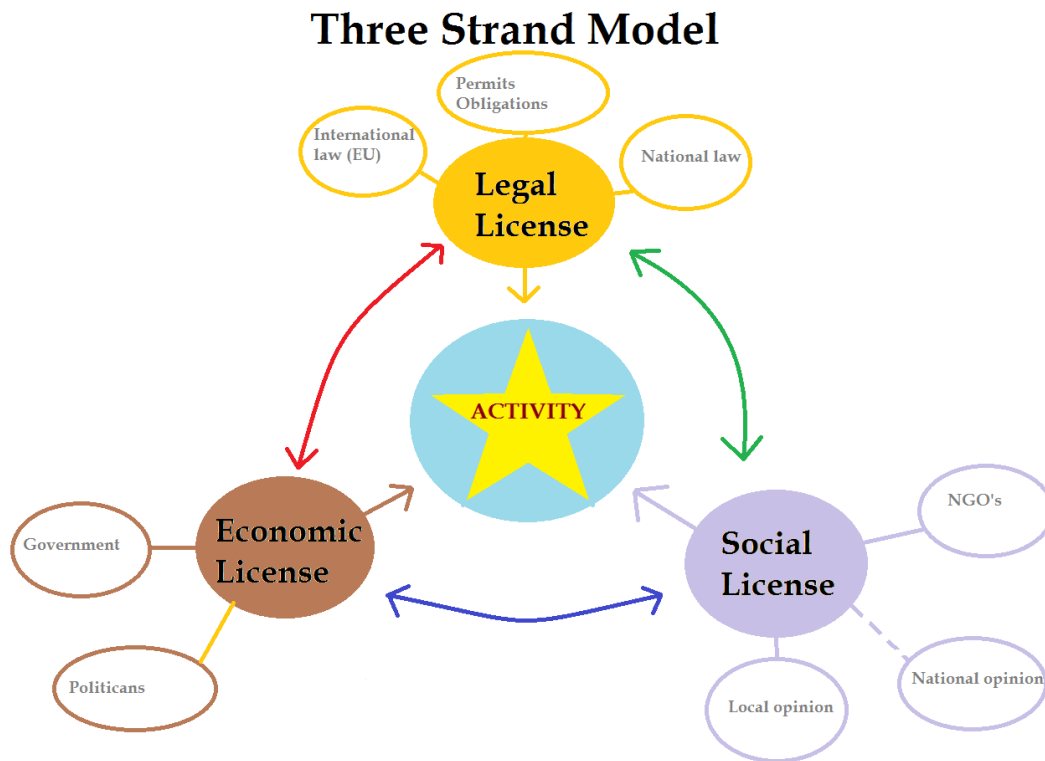


Figure 4: A figure of the three-strand model colorized. Each color represent a separate communication channel between the strands and the activity. The white bubbles are indicators of which type of external affection each strand might consist of. (Gehman, Lefsrud, & Fast, 2017)

4 METHODOLOGY

The research problem for this research was described in chapter 2 as "*The hydro operators in Värmland indicate that the hydro power plant permit application decisions are based on opinions rather than facts*". More explicitly, this research examines the permit applications of a major hydro operator in Värmland, Fortum, and how the CAB in the specific county has argued for their decision in the applications.

The problem is approached by looking at application cases retrieved from Fortum, which describe what has been applied for and how the CAB has decided and argued for their decision. The applications also shortly present the opinions of important stakeholders for the matter. Important stakeholders for hydro applications are locals directly affected by the operation, organization's caring for the culture, fishing, or environment in the area, and in some cases other authorities such as the Naturvårdsverket.

An indication of opinions affecting the decision making at the county can be noted with the help of the three-strand model presented by Gehman, Lefstrud, and Fast (2017). The three-strand model argues that all parties that can affect the activity are communicating outside the activity as well. If the CAB argumentation is not in line with the strategy of the county or legislative force, but clearly is affected by something external, the three-strand model can explain the relation. The SIA will be used as a theoretical explanation of how the social aspect should and could be taken in consideration in future application processes.

The most common research designs are case studies, longitudinal, comparative, and cross-sectional. These can be grouped according to their relevance of time and cases. Case studies and comparative studies, are as their name suggest looking at separate cases or comparing results from different case studies (Flick, 2007; Bryman & Bell, 2007).

Cases can be defined as a separate study of an individual or an organization and how others aspects can affect the outcome of the case (Flick, 2007).

Comparative studies focuses more on the context of the cases and how they can be interpreted and compared. Longitudinal and cross-sectional study approach describe the different ways of a long stretched research, where the cross-sectional design obtains its empirical data in one single time, whilst longitudinal research gathers data over a longer period of time by returning to interview the same respondents at several occasions (Flick, 2007).

This research is a case study of how the CAB of Värmland considers the social and environmental aspect of local opinion in hydro power permit applications. Case studies can be both qualitative, quantitative, or a combination of both (Bryman & Bell, 2007). This study will be more qualitative than quantitative. Case study has been chosen as the research design and methodological approach as case studies are useful for understanding a limited number of complex situations in a specific context (Bryman & Bell, 2007).

As case studies are limited to certain contexts, the result may not be generalizable without a large quantity of material. It also indicates that some important information might be missing from the cases, making it difficult to interpret the result. Greener (2008) argues that case studies can be combined with different sources of information to understand the case better. Such "extra" information can be obtained through discussions, interviews, and analyzing other interesting documents. In this thesis interviews and discussion with internal experts at Fortum have been used as extra sources for information. The combination of these will allow a better understanding of why the problem has occurred.

The data for the study has been obtained from five applications shared by Fortum and two interviews with employees at the CAB. The empirical data has been chosen to answer the main research question presented in chapter 1 as *How is the social aspect included in the decision making at the CAB in Värmland?*. The cases reflect different applications which are in line with both Fortum and county sustainability goals and still met opposition.

The most important information retrieved from the cases, is how the CAB of Värmland has argued for their decision of certain applications and if these decisions reflect the local opinion for each case. The application cases offered by Fortum are the main data obtained for the research. The interviews are added as "extra" information to give the result depth and to decrease the possibility of a biased result. The interviews shed light on how the CAB view the social and environmental aspects of hydro operations.

The researcher can approach the study by either formulating the research from theory before gathering data, or vice versa. These approaches are called deductive (theory to empirical data) and inductive (empirical findings completed with theory) (Lancaster, 2005; Fereday & Muir-Cochrane, 2006). This study has been implemented in a hybrid approach of deductive and inductive research approach. The hybrid approach indicates that the researcher allows the knowledge

grow successively, as (s)he switches between theoretical frameworks and empirical data (Fereday & Muir-Cochrane, 2006). This hybrid approach is sometimes called abductive (Bryman & Bell, 2007). The abductive approach to the study can be noted as the literature review and application cases have been studied before the interviews were conducted. Thus, the theories and the situation were known when planning the interviews.

The result is analyzed by looking at how the CAB has answered the different cases and if there are any possible opinions affecting the outcome. The three-strand model introduced in the literature of SLO was used as a platform to describe and find possible opinions affecting the decisions in the applications. Each case will be analyzed through whether the case is based on a social or environmental issue, how the EA of a specific case might challenge the SLO, what arguments seems to be the ground for the decision making at the CAB, and how has the case possibly created a social challenge

The chapter will continue with a presentation of how the study has been implemented. The chapter will also present the limitations of the study.

4.1 Implementation

The implementation has happened in four steps: pre-discussion, data gathering, literature review, and data analysis. The steps have been conducted in a manner to understand the research problem and the cases before applying theories and complimentary information. The cases showed what has been planned to do, what opinions were expressed, and how the CAB of Värmland acted. The interviews introduce the social aspect of the issue. This chapter will describe the implementation of the study and the results obtained from it. The whole process has lasted approximately five (5) months.

4.1.1 Pre-study actions

The study started off with a research proposal for both Jyväskylä University and Fortum Sweden. When all parties approved the research proposal presented by author, the gathering of information regarding the problem started. A pre-thesis discussion was made to shape the research question and problem and give the author a sense of reality for the subject. The results of these discussion is found in Appendix 1. Several respondents answered that the perceived problem is mainly in Värmland and that the lack of knowledge is alarming. It was mentioned that the lack of knowledge is noted through this unrealistic view of how the world functions. It can be argued, that it might not be personal viewpoint shining through in the decision-making process but merely a written testament of the

overall viewpoint within the county. This though, may not be answered without knowing the organizational culture at the county.

4.1.2 Empirical data and literature review

The pre-discussions showed interesting topics to study. In compliance with what the respondents in pre-discussion answered and the scope of the thesis, five (5) cases were chosen together with the supervisor from Fortum. All case related material has been obtained internally from Fortum, despite them being official documents. Three cases were regarding dams (Kolsjö, Liksjö, Kvarndam), one was a power plant modernization (Forshaga), and the last one (Fryksfors) was added as a comparison of how the CAB acted 10 years ago. The cases were analysed separately, to minimize the risk of biased analyzation.

The interviewees for the study has been chosen according to their relevance of the cases introduced earlier. The interviews were semi- structured. Semi-structured interviews allow for some discussion within the limits of the subject and might give a good insight for the topic, which has not been assessed earlier. Personal interviews also allow the interviewer to read the reactions of the interviewee, in case (s)he expresses any (Bryman & Bell, 2007). The analysis of the interviews was conducted abductively. This indicates that the researcher has been acquainted with theories and other empirical data, before executing the interviews. The result of the interviews was then related to the theory again.

It is of strong interest for the author to allow the interviewees to be anonymous and to avoid using any names or positions that may cause any harm to anyone. The interviewees are therefore named as Respondent X, where X is a specific letter assigned for each respondent. The questions asked during the interviews are presented in Appendix 2.

The first contact with the interviewees was through email. Five possible respondents were contacted. These were chosen on their position at the CAB of Värmland. All interviewees are working with environmental questions. As the interviews are merely an additive to the cases, only **two** people were interviewed. After contacting the interviewees, the dates for the interviews were set. As the interviews were to be performed face-to-face, the dates were set as close as possible to each other to minimize the need for travelling.

The interviews were planned after the cases were analysed. This was done because the cases showed what opinions had been expressed and by whom, in relation to what the county administrative board in Värmland decided. The "gap" in opinions and actions could be explained by theories and answers from the interviews. The questions were co-written with supervisors at Fortum and approved by university supervisors before execution. This was done to increase the possibility of asking relevant questions. Articles, information, and writing theories were all done simultaneously with the case studies, but before execution

of interviews. This approach allowed the author to be aware of the situation and theory whilst interviewing.

The background information for chapter 2 was found by using search words such as: Värmland: Sveriges regering, kungahuset i Sverige, länsstyrelse, älvräddarna, vattenkraft, svensk vattenkraft, miljömål, miljöbalken, hydro power, Fortum, sustainability at Fortum, klimatstrategi för Värmland, regleringsbrev, and miljö- och markdomstolen. A lot of the information was found in Swedish and translated for the thesis.

4.1.3 Data analysis

The data has been analyzed abductively. This means that the cases have been analyzed first before the theory has been reviewed. When literature review was conducted, the application cases were corrected with the theories. The interviews were planned and executed after both application cases and literature had been reviewed. The application cases were analyzed with four questions: whether the case is based on a social or environmental issue, how the EA of a specific case might challenge the SLO, what arguments seems to be the ground for the decision making at the CAB, and how has the case possibly created a social challenge. The analysis question were designed to give an answer to the sub-question for the study presented in the introduction. The interviews were compared between respondents. The result of the interviews were then used to either confirming or disapproving possible results from the application cases.

4.2 Delimitations

Delimitations of the study are: geographical area of Värmland in western Sweden, cases accessed through Fortum Sweden, cases that have somehow created discussion and controversial actions on some part, and the cases are not older than five years, except Fryksfors. Fryksfors case is added to show how the CAB argued for their decision ten (10) years ago. The information for the empirical data is gathered from Fortum's internal databases.

Värmland has been chosen as a study area as a lot of discussion in media has revolved around the county and because there are three major river systems in the county hosting several power plants and dams. The river systems in Värmland are Norsälven, Byälven, and Klarälven. Fortum owns up to 38 power plants and several dams in Värmland and the access to possible cases is decent. The limitations and cases have been chosen based on discussions with internal experts at Fortum.

5 EMPIRICAL DATA

This chapter includes presentation of the empirical data gathered from the cases and interviews. The presentation of the cases will include what has been planned, technical properties of the construction affected, environmental impact of planned proceedings in the matter, and opinions expressed during the application process. The information accessible for each case varies, and thus the cases will be described in different depths. All cases will be presented with any critical information accessible for the author. The interview section will cover the respondents background and relevance to the study.

The application cases are analyzed according to: whether the case is based on a social or environmental issue, how the EA of a specific case might challenge the SLO, what arguments seems to be the ground for the decision making at the CAB, and how has the case possibly created a social challenge.

The interviews were conducted towards the end of the research, as theories and cases have shed a light on the problem and allowed the researcher to recognize question which can't be answered through existing materials. The interviews have been conducted in an abductive manner. The interview questions are presented in Appendix 2 in both Swedish and English

5.1 Application cases

The cases are different projects concerned with demolishing or renovating dams and power plant constructions located in the county of Värmland. The cases have been chosen according to their relevance to the subject as they contain interesting opinions and actions of the county and other stakeholders. The cases are of different age and stage, as some of the cases are still waiting for answers from the county before they can be executed. This has been taken in consideration.

The application cases are presented with what was applied for and how the CAB argued for their decision.

5.1.1 Kolsjön

The Kolsjö dam case regards a demolition of an old dam in Arvika municipality. Arvika lies in the western part of county of Värmland. In 2012 there was a regular check of the dam and it was concluded that it needed reparation, as several leakages were found, and the concrete was determined to be in bad condition. The dam had earlier served a purpose for power generation. The dam was used as an annual regulative force for the Glava power plant and for fleet operations. Old maps of the area suggest that the lake have been dammed since 1883. However, the dam no longer served any purpose as the regulation of the lake has been shut down during the 1990's. The uselessness of the dam concluded in a decision made by Fortum to demolish it and return the river to its natural state.

Removing the dam from the river would increase the well-being of the water body as a whole, as fish could freely roam the waters, the flow of the river would become natural, and the risk of the dam collapsing would be eliminated. The water level changes would not affect any construction nearby, nor have a negative effect on the environment. The possible impact would come during the actual removal of the dam as noise from machines. The river Kol has a strong flow, which makes it a great river for fish to repopulate. The whole case has been assessed as a positive addition for the local environmental status.

The dam itself was constructed of six parts: a buttress connecting the dam to the shore, a spillway with a width of 2 meters, a continuous part of the buttress, a shallow spill way with the width 1,4 meters, a third part of the buttress, and a connective dam. Of these parts only the last one (the connective dam) would be left, everything else would be removed. The connective dam does not hinder the free flow of the water and is not classified as a construction in a water body.

To speed up the relapse to the natural flow, Fortum will enforce biotopes around the area and even out the fall height to ease the passage for fish. Even out the fall would be achieved by distributing debris of different size in the river. The debris would work as a good mating place for trout and salmon. The debris output gives the slope a 3-5% inclination which resembles the inclination of the other water streams in the area.

The project has been planned to be executed during low water season, July-October. The planned method would be to remove the dam parts first and the buttresses afterwards. Thirdly, any concrete that is left shall be removed. Lastly the river bed should be evened out for the new more forceful flow and the debris added as the last action. After the process biotope treatments will continue to help the trout to find the new passage. The river has been dammed for so long that it is impossible to know what the natural state was before any modifications were

introduced. All the suggestions are approximations of how the river would act in case of free-flowing scenario.

Opinions expressed for the case came mainly from the county administrative board (CAB) of Värmland. They quoted the issue of natural drought in the area as a future problem and something that should be monitored. They were also concerned about the well-being of the fish and their possibilities to repopulate even during drought. CAB therefore considered the nurturing actions proposed by Fortum as incomplete.

Simultaneously the definition of the planned actions was questioned. The CAB argued that the case should be handled as a change in construction rather than a complete removal as a change of definition would indicate different legal forms and EA. The CAB of Värmland considered that the connective dam which would be left after the demolish, might have damming attributes and should be considered as a construction in water, despite it being located on land. Other stakeholders had a neutral or positive approach for the demolishing of Kolsjö dam.

CAB demanded Fortum to take economic responsibility of the area after the removal of the dam, in case the suggested actions are not effective. They considered the "polluter pays" principle is applicable in this case. The polluter pays principle was introduced in 1972 by OECD to raise the environmental responsibility at companies by integrating economic and environmental policies. The principle indicates that the user ("polluter") will stand for the cost of preventing pollution and costs of measure. (Organisation for Economic Co-Operation and Development, 1992)

The decision was overruled and settled in court. The court decided that Fortum may remove the dam as they applied for. They did not see that the demands made by the CAB were necessary. The application is seen to be accepted by the social strand as no opposition occurred from the community. Though, the CABs argumentation can be seen as a lack of confidence from the legal strand in Fortum's SLO. Thus, is the quality of the SLO lowered.

5.1.2 Kvarndam

The Kvarndam case assess a dam located next to an old mill in the municipality of Torsby, in the river of Röjd, near the Norwegian border. The dam has been functioning as a regulative force in the hydro system and as a historical source of energy for the mill situated next to the dam. The dam is no longer useful for either mill nor Fortum. Simultaneously, it was noted that the dam lacked permission for operation. Fortum has therefore proposed to demolish the dam as an environmental improvement act. Buildings at the dam site include a mill building where the grain has been dried and a miller's residence, now privately owned.

The mill building is in direct contact with the dam and has been active from 1697 until 1962 (Torsby Turistbyrå, 2018). The mill was replaced with a new building in 1859 and is today the best preserved mill in Värmland. The dam serves no other purpose than keeping the water level in the lake at the same level as these past 300 years. The lake creates a reflective plan which is culturally significant for the mill and the cultural landscape. Therefore, the cultural committee at Torsby municipality has asked Fortum to renovate the dam rather than demolishing it, as the lake created by the dam is of high importance of the cultural landscape.

The dam itself is 40 meters wide and 5 meter high and constructed of stone masonry. The dam has three intakes for water, and two spillways. The intakes are located on the outskirts of the river, and the spillways in the center between the intakes. The dam lacks regulation limits which increases the difficulty to assess the true damming properties. The environmental impact of a demolition has been assessed to increase the ecological well-being of the water body. A preservation of the dam would maintain the eco-system which have grown around the dam since the 17th century and care for the cultural value of the landscape. The environmental impact of preservation is therefore negligible, as the only effect of preservation would be impacts during the renovation.

The application of Kvarndam actions was sent to CAB of Värmland in 2016. In the application Fortum referred to the 11 chapter and 12§ of the Environmental code, which states that permission may be granted to constructions in water in case the proposed actions cause no harm to individuals, community, or environment. The CAB of Värmland declined the motion and indicated that Fortum needed to apply for a separate permission of running the dam as well as a permission for renovating the dam according to the Environmental code. CAB found the referral to 11:12§ too weak to serve as a ground for a decision. If Fortum were not to apply for a permission for the dam, Fortum were asked to apply to remove the dam entirely.

Other stakeholders were concerned for the preservation of the cultural landscape. The organization for fishing of the area also wished for a preservation of the dam structure, as the dam preserves the lake mussel and it cannot be proven that the dam would serve any wandering fish as it is so far up north. The organization for fishing considered therefore the cultural preservation more important than risking the biological welfare of the lake.

Fortum decided to answer the cultural preservation of the area with suggesting alternative actions on how to preserve the dam and whom should claim ownership of it afterwards. The solution was a mutual payment of the dam renovations between Fortum and the municipality of Torsby. After the renovation the ownership would transfer to the municipality. Fortum applied for legal declaration of the dam with the notion that the operation responsibility will be on Torsby municipality declaring Torsby as the legal owner of the dam.

The social strand expressed their concern for the mill and it was taken in consideration by Fortum. The activity can be seen as having SLO from the social strand. Though, the CABs argumentation continue to question the SLO of Fortum. Thus, is the SLO of the activity is weakened.

5.1.3 Liksjö

Liksjö dam served no purpose to Fortum and was found to have several weak points, which indicated an urgent need for reparation. The suggested actions would allow a stricter follow up on how the water moves in the area and in case any changes would occur to the area. The application itself was an environmental issue. The dam was in bad condition and needed urgent attention. The application became a social issue when the CAB found the dam to be without legitimate permits. The social strand expressed negative opinions of the actions, as it would modify the water level of the area.

Fortum proposed actions for the dam consisted of decluttering the rim of the water body and to fill them with protection against erosion and to even out uneven areas, study the reservoir through diving to find possible sinkholes, cut down forestry close to the outlet of water downstream from the dam. These actions would allow an easier notification of changes in the water body and finding a reason for the high ground water levels. Simultaneously, the leakages found must be fixed and prevented from reoccurring.

Fortum applied for making changes to the dam, to which the CAB answered that the dam had no owner and that Fortum may under no circumstances continue using the dam for power production. Fortum had thought that the dam of Liksjö was under their ownership and that they therefore carried the responsibility for it. The dam had been first been owned by Stora Kopparbergs Berlag AB before they transferred the ownership to Uddeholm Kraft Ab and Gullspång Kraft (today Fortum). This information was given by Birka Kraft to the CAB in 2000, during which they considered themselves responsible for the dam. Birka Kraft was a part of Fortum, and because of this Fortum considered themselves as responsible for the dam.

The prohibition of repairing was the most economical solution for Fortum as the dam served no large economic benefit for the power production. The prohibition of executing reparation and damming for power production resulted in actions of removing some of the damming functions of the dam in compliance with the decision of the CAB. Partial removal of the dam lead further on to a lowered water level in the lake. The lowered lake level was a starting point for opposition from the organization of fishing in the area and private persons owning land alongside the lake. The local opposition considered physical changes such as difficulty for fish to wander, dried up wells, and rebuilding of boat- and bath places were effects of the partial removal of the dam.

These private land owners decided to complain about the matter as they deemed someone to be responsible of the negative impact on the environment after the dam removal. The CAB explained how the dam had been declared without ownership and that no further actions are to be taken. This explanation was approved by the court. From a theoretical point of view, the Liksjö application case has a low SLO. The CAB and the social strand opposed the actions, but on different terms.

5.1.4 Forshaga

The application for Forshaga concerned a reparation of two spillways at the Forshaga power plant as the spillway units has reached their technical age. The old wheel hatch type of spillway would be changed into a plain hatch with a hydraulic press. The Forshaga power plant has four spillways, out of which three are the wheel hatch type, and one is a segment hatch. The size of the spillways are 15 meter wide and 3,5 meters high. The power plant has been running since 1950 and its annual production is 43 GWh. The work is considered to improve the safety of the dam significantly. The nearest building is located 150 meters away from the power plant. The power plant including the dam, is a large construction and for safety reasons fishing has been prohibited at the nearest areas of the power plant. There are two different fishing organizations controlling that these guidelines are followed.

The expected length of the project is a year, as the project requires a lot of carefulness whilst working in water. Some of the area around the power plant will be dried out as there may not be any water at the spillways during reparation. There will also be built a new service house to ensure the smooth operation of the new spillways. To ensure further safety for environment and employees, only one spillway will be turned off at a time. This way it can be ensured that the water levels will not become dangerously high.

The construction work may cause temporary environmental impacts such as reorganization of fishing in the area, noise, and some turbidity in the water. The work conducted in the water has been deemed to be short and will therefore have a limited effect on the environment. The work has been estimated not to affect the possibility of using a natural path near the power plant, nor affect a cultural historical area nearby, or the operations of an industrial power plant nearby.

The municipality of Forshaga expressed their requirements to Fortum related to the machines, which were planned to be used in water. They wanted Fortum to describe closer how they clean the equipment to decrease the risk of spreading water borne diseases and how Fortum was planning on decreasing leakage possibilities from machinery. The local fishing organizations did not see any harm with the project.

CAB expressed opinions regarding operational time and safety instructions. The work may only be executed between the dates of first of October until the first of April. During other times of the year fish migrate to the area of the power plant, and CAB of Värmland wishes to minimize any harm caused to these fish populations. Simultaneously, they require Fortum to install a catch dam for fish, to decrease the environmental impact. CAB also demanded that Fortum should follow the precautions presented in their application regarding clean machinery and decrease leakage possibilities. The water removed from the river must pass a particle separation before being added to the river again.

Though, despite these guidelines, the CAB announced that they are going to forbid the proposed actions. They argue that the proposed actions would discriminate the earlier permits allowed for the area and that Fortum must apply for a new permit from the court. The CAB concluded that the application was not within their deciding power. Simultaneously, they considered that the existing permit would need re-examination. They argued that the proposed changes would change the construction so much that the existing permit would not cover the changes.

The case has been overruled by Fortum as they deemed the precautions to tight and not realistic. As a result, CAB of Värmland forbid Fortum for any further actions in Forshaga until the Land and Environmental court (*swe.* Mark- och Miljödomstolen) has expressed their opinions. Fryksfors application has a weakened SLO. The social strand did not react to the proposed actions, but the legal strand reacted rather vividly. The strong approach from the legal strand shows that the CAB does not approve of the activity, and the SLO of the activity is weakened.

5.1.5 Fryksfors

The Fryksfors case concerns a replacement of an old power plant in the municipality of Kil, in the river Nor. The power plant regulates the water level of the Fryken lakes. The old power plant consists of four units, of which one is out of service. The power plant is built in 1907 and the expected lifespan of the power plant has limited time left. The requirement of a fish ladder was revoked in 1945 for the power plant. In 1988 a second unit was built in a separate building to cover the losses of the unit shut down in the preliminary power plant. even though the flow amount (m³/s) will decrease with 2 m³/s, the generation will rise with 14 % with the new power plant structure. The suggested work for Fryksfors has been to rebuild the entire structure, as it would save both time and money instead of renovating the old construction. Some cultural damage is noted to occur with a rebuilding, as the historical building of the 1907 power plant will be destroyed in the process.

The city council of Kil determined in 1993 that the power plant in Fryksfors is a well-preserved cultural heritage from the 20th century. The power plant holds a cultural importance for the area. There is a mansion upstream from the power plant, which is especially noteworthy from a cultural perspective. The most significant aspect for the mansion and area overall is the complete natural image. The city council of Kil therefore advises the energy company to preserve the imagery of the cultural historical area of Kil and its mansion and dams by choosing similar building material and colors and keeping water levels at same height.

The power plants lie close to living areas (100 meters to closest house) and all the needs of the citizens must be answered as well. The environmental impacts are negligible. During the building process some noise will occur, and some air pollution might be generated. Some flora and fauna may be hurt during the rebuild as the river bed will be dug out for the new units. Though, according to the assessment done by the county of Värmland, there are no specific endangered species to take in consideration. As the work affects such a small area and there is no specific species to protect, the water body will recover soon after the work is finished and therefore the environmental impacts are negligible.

The new units at Fryksfors, will not affect the fish population. The units that are being installed are considered friendlier for the fish than the old ones and are a positive change to the power plant and the river. Natural resources will be utilized and affected during reconstruction, but not during usage. Other risks associated with the rebuilding is chemicals and waste. Though both chemical and waste accident are assessed as not likely to impact the environment, as they are strictly monitored.

The fishing organization of the area mentioned that there are no endangered species in the area and that no specific interest must be paid to the fauna. Though, they wished that the turbidity should be minimized at all costs and that no negative impacts on the water body should occur. They also suggested that the work in the river should be avoided during important repopulating times of the fish in spring and early summer. Exact dates should be discussed with the CAB. As the dam serves as an obstacle for wandering fish, a fishladder was suggested as an improving action for the area. Though, the court deemed the fish ladder aspect invalid as it had been revoked in 1945. In case of a fishladder, Fortum must apply separately for that. One private person expressed concerns of the regulation of the dam, and that no changes were to be made to the regulation of the lake, as it would have large consequences to locally built infrastructure.

CAB of Värmland allowed Fortum to continue with their plans as long as the new building followed the guidelines that were presented in the application. The CAB mentioned separately that it is Fortum must communicate separately with the city council of Kil to preserve the cultural landscape as well as possible with the new building. Fortum mapped the entire area for cultural heritage of the building and planned the new structure accordingly. The Fryksfors case is a good example

of an obtained SLO and balance in mediation platform. The activity was not questioned by any strand, and thus can it be stated to have SLO. The concerns that were expressed, were taken in consideration in the decision made by the CAB.

5.2 Interviews

5.2.1 Respondent A

Introduction

Respondent A works with energy and climate strategy questions within the county. He began his career at the region federation where he worked with energy and climate questions. After five years he switched over to the CAB of Värmland where he has been ever since working with the environmental and climate strategy of the CAB.

The CAB receives annually a letter from the government which states what should be achieved during the year in the CAB. This year's letter includes a new energy and climate strategy for the CAB, which is one of the main projects that the Respondent A works with. He also mentions that all questions regarding promotion of renewable energy and climate questions lands on his desk. He works half of the time at the CAB and the other half at a national board in relation to his expertise. Though, this interview assesses the work at the CAB. The average working day consist of answering emails, planning meetings, and coordinate different projects. Even though his day mostly consist of intangible tasks, he does not see any difficulties in his work.

Energy

Respondent A said early on that there is a clear distinction of what is green energy and what is renewable energy. Renewable energy is defined according to the official EU definition and includes all sources of energy that may be deemed renewable. Green energy is a more loaded terminology which includes a socioeconomic aspect. Green energy as a definition may vary between individuals as everybody has their own perspective of what is "green". He defines renewable energy according to the fuels possibility to be renewed within a relatively short time period. This shows why eg. peat can be considered either renewable or finite, as the time for renewal is long.

The annual letter from the government states that the CAB is in charge of promoting utilization of renewable energy sources, whilst simultaneously monitoring their actions. The promotion of new source is momentarily the most important task, in which wind power is the most popular source. Solar have some

future potential as well. Hydro power is difficult to increase and is therefore not as much on the interest of Respondent A.

"It is not so much about promoting new (hydro power), because it is difficult to create new, there (hydro power) it is more about developing and environmentally adapt to obtain new permits" (swe. Det handlar inom att främja ny, för det är svårt att skapa ny, där e de ju att få utveckla och miljöanpassa för att få till tillstånd).

He mentions that the hydro power plants are more under the subject of being renewed in relation to new environmental standards so that the energy could be defined as "green" rather than just renewable. The largest obstacle for new power plants or renewals is the difference in knowledge. It is of utter most importance and interest to join individuals salient for a project in a mediation to increase the possibility to succeed in the project. Mediation allows a shared platform of information and that everybody has the same knowledge regarding the project. He mentions that the shared knowledge is important for a successful project and that the CAB is trying to organize these meetings when possible.

Respondent A considers that hydro power should be viewed according to their size. Large scale hydro powers have an irreplaceable importance for the energy system in Sweden and is growing with the addition of wind and solar power. He mentions that it is the regulative force of the hydro power that makes it irreplaceable. Small-scale hydro power plants are not significant for the national production of energy and does neither hold any significant role of regulative force. The small-scale production is therefore more likely to be demolished or required to implement large changes in favour of the environment.

"Hydro power has a meaningful role in the energy system and that is due to the regulation capacity which can control the production. The value of hydro power will rise as wind and solar power production increases" (swe. vattenkraften har en betydelsefull roll i energisystemet, och då är det ju utifrån regleringskapaciteten som går att reglera användningen. Och den kommer att öka ännu mera värde när vi får ökad vind och solproduktion)

He mentions that "renewable energy is not the same as environmentally friendly" and that this is important to remember. Even though a wind park or hydro power plant is producing emission free energy, the location of the power plants might decrease its environmental friendliness. The location is key to find a balance in socioeconomic and environmental benefits. That is also one of the reasons for the strong contradicting actions. Hydro powers are old and are not placed according to modern socioeconomic or environmental standards.

Opinions

Respondent A considers that the CAB and energy producers in the county has a good relation, despite that there has been a lot of media attention in Värmland. The CAB and entrepreneurs in wind power are more unified as they both strive for the same goal. The hydro power owners on the other hand might feel cornered by the attention given to them and the sudden requirements of implementing new environmental friendly changes. Despite both parties (CAB and owners) strive for the same future, the way there creates a gap in their perception of what is the best for future generations.

"Mainly it is the small-scale power plants and their owners (that show opposition), they feel cornered in the situation as they see that their work will be cropped." (swe. Det är ju främst gäller de små ägarna och små kraftverken tror jag som upplever sig trängda i sin situation, dom ser att det är risk att deras näringsverk kommer att beskäras)

There has been some media attention of how the owners of hydro power plants perceive the CAB actions as negative and that their mission is to demolish all dams and power plants for fun. Respondent A states that it is nowhere true claims that has been made about them. He mentions further that the arguments used against the CAB in media usually circle around ideas that the CAB is not interested in developing the area socioeconomically and that the landscape shouldn't be preserved, especially if it regards small-scale hydro power plants.

" I guess that with the small-scale hydro power it is easier to connect a general that the CAB is against the hydro power and that we (CAB) want to hinder the development of the landscape and so on" (swe. Jag kan tänka mig att med småskalig vattenkraft, så där är det lättare att koppla ihop ett allmänt, ni är emot vattenkraft och vill hindra landsbygdsutvecklingen osv)

Despite conflicts, Respondent A still sees that the national and regional opinion regarding renewable energy is rather similar (no social gap) and that people are accepting of the actions taken by the CAB. The engagement circling the question of hydro power is divided and fights more against the CAB than the power plants.

5.2.2 Respondent B

Introduction

Respondent B works with questions regarding improvement of water body well-being within the county. She has been working at the CAB for 12 years. Her focus has been the well-being of waterbodies in the county of Värmland in

compliance with the water directive proposed by EU. During her career at the CAB it has been noted that the water streams in the county are strongly modified physically by dams and hydro power plants. The physical changes do not affect the quality of the water but affect the local ecosystems. Her main focus now (2018) is a joint project with the Norwegians concerning the Klar river which runs from Norway down through Värmland to the lake Vänern (See 2.2). The main aspect of the project "*Två länder - en élv*" is to environmentally adjust the physical changes in the river to improve the overall well-being of the water body and to increase the possibility of fish to migrate more north than currently possible. The project has been active for eight (8) years and is currently striving to implement actions.

Being a project leader includes many meetings and her days are filled with different internal and external meetings. She assessed that approximately 75% of her time is used for the project and her main task is to "act as a spider in the net", indicating that she needs to manage everything, and everyone involved in the project so that the project goes in the desired direction.

The management of a large project allows Respondent B to communicate with different stakeholders related to the project. Currently the project (*Två länder - en élv*) is looking to adjust power plants and dams to become more environmentally friendly. She mentions that the adjustments have earlier been conducted from a strictly authority perception, and therefore been quite distressing for everyone one involved. An authority approach does not assess socioeconomic aspects and can give only two ultimatums "either you apply for the right to run then power plant or you demolish it". Respondent B mentions her concern of this approach to the applications as it increases a gap between the CAB and operators. It would be of interest to increase the communication between the CAB and power plant operator to avoid conflicts in the adjustments processes.

"I think that we (CAB) should involve in a dialogue with the hydro power plant owners. The way we have worked has created a lot of anger and grudge, and many are worried for what may happen" (swe. För det skapar väldigt mycket klyftor, det skapar agg, det skapar ilska så som vi har jobbat och det är många som är oroliga för vad som kan hända)

Her many meetings allow her to actively communicate with all parties and allow her to share the concerns of everybody involved. Especially in meetings gathered by a "water council". A water council consist of salient stakeholder of one certain water systems, eg. a river or a lake. These water councils are the perfect mediation platforms for sharing knowledge and concerns. She wishes thus that other parts of the CAB could be involved in active communication to avoid future conflicts. It is important to involve local population so that they know what is valuable in their premises and what can be done to maintain or improve the status of their premises. Only then can good management happen. Local acceptance and

understanding of proposed actions is necessary for future sustainability motives in the area.

Despite it being important to involve external stakeholders, it has been difficult. There has been a strong opposition for some time now, especially from owners of small-scale power plants. Respondent B argues that the opposition is created as involved stakeholders act from different knowledge bases. She mentions that these difference in knowledge has made that there is no unified language and misunderstandings and interpretations are common. She also mentions that the low visibility of the CAB in the county has deepened the conflict, as there is no real contact between authority and locals.

"...there hasn't been a shared knowledge base. Both sides have had deficiencies in their knowledge which leads to the fact that you do not talk the same language" (swe. ...man har inte haft ett gemensamt kunskapsunderlag utom att man satt båda sidorna har haft en kunskapsbrist tror ja vilket gör att man inte talar samma språk.)

Another aspect creating some difficulty has been the vague legislation of water in Sweden. The old legislation never questioned the existence of hydro power or the environmental friendliness of them. Hydro power does not need to be an obstacle for fishing. The Swedish government has also noted that the legislation is outdated and has proposed a new water legislation. The change in the legislation has affected the focus of the CAB. Respondent B considers that this fast change in focus on hydro power plants and questioning their operation causes major distress. Though, she reassures that the worst is probably ongoing, and everybody will calm down as more hydro powers have been adjusted to the new requirements.

Energy

Respondent B said that defining green energy is difficult, but she would argue that in her field of expertise it is seen as fossil free and environmental friendly. Renewable energy can then separately be seen as only fossil free. There is a fine balance between which negative aspects that can be accepted in favor of energy production. She discussed the difference in small-scale and large-scale hydro power plants to visualize her idea. Large-scale power plants may easily be offered permits for operation as they carry an important socioeconomic role. Small-scale on the other hand are causing more harm than benefits and might therefore struggle to obtain a permit. Despite them both being theoretically the same, every power plant must be assessed separately so a trustworthy decision can be made.

"Several small-scale power plants are receiving declined permits because they are seen to cause more damage than benefit" (swe. så att flera små anläggningar har fått avslag

på tillståndsansökan för att man har sett att de är för små, att de skadar mera än de ger)

Her expertise concerns hydro power and cannot therefore express what the CAB does for other source of renewable energy. In hydro power on the other hand, the CAB is actively striving to improve and retry the environmental permits of all dams and power plants in the county. She mentions that there is an excess of dams in some river systems and some of them needs to be removed in favor of the environment. Unnecessary dams are interfering with the restoring of habitats. There is an urgent need to restore flowing habitats. The ecosystem that has grown around a dam has a possibility to flourish nearly anywhere, but ecosystems dependent on flowing waters do not have the same possibilities. Dams are acting as obstacles for these habitats and should be demolished in case they do not carry any socioeconomic value. Restoring some of the flowing water habitats in the water system would increase the environmental friendliness, or "green" status of hydro power plants. Respondent B sees that hydro power is a great source of renewable energy, as long as it has been environmentally adjusted.

"The flowing water habitats have disappeared with the building of dams. There are little flowing water habitats left. Our assumption is that several dams needs to be demolished in favor of the habitats" (swe. med alla dammar så har dom strömmande vatten dämts upp så att det finns inte så mycket strömmande vatten kvar. Vår bedömning är att många dammar behöver försvinna för att få tillbaka strömhabitat)

The supervising task of the CAB allows them to supervise how the operators are following their permits and indicate a retrial of a permit in case they do not. Though with the change in legislation and unexpected attention given to the hydro power operators has been taking its toll on the relation between the CAB and hydro power operators. The quality of the relationship is also affected by the low activity in communication from the CAB's side. The Respondent B feels as if the operators have not yet grasped how they suddenly are the bad guys, when they are producing energy with clean sources. She adds that the CAB are internally trying to figure out how to address the situation and how to increase profitable communication.

"Of course they consider hydro power as a good source of energy, which it also is, but suddenly they are perceived as environmental villains. It must be really hard for them emotionally and that causes conflicts as well" (swe. Dom tycker ju såklart att vattenkraften är en jätte bra energi källa, vilket den är och helt plötsligt så är dom miljöbovar och det är ju jätte jobbigt känslomässigt så det skapar ju också konflikter.)

Opinions

When it comes to the activity of the locals, the respondent sees two parties: those who are supporting and those against changes in hydro operations. Those against the changes are both locals, politicians, and organizations. They are worried what the changes might physically do to their neighborhood and how the owner of the dams or power plants will survive after the changes. They are scared that the changes will affect them negatively. She continues explaining that the neighbor county, Örebro, has studied this phenomenon and found results indicating that after implementing proposed changes the locals were rather happy with the result. Basically, it is a mental process of accepting change.

"What is interesting to see (from Örebro study) is that usually it was the people living around the dam that was the most worried, but afterwards they though the result was pretty good. It is alot about change a process of change one has to go through" (swe. jätte intressant oftast vad de ju dom som bodde runt dammen som var mest oroliga men efteråt så tyckte dom att det blev ganska bra ändå. Det är alltså mycket om förändringsarbete och att man måste gå genom en process)

The politicians on the other hand are active in debating the matter in local newspaper and are not as easily argued with. They are blaming the CAB for wanting to ruin the drinking water and drying up wells and so on, even if their true worry regards the dam owners. Those supporting the changes are valuing the environmental adjustment more than the profitability of the dam owners. The respondent emphasize further that it is important to note that they are both right in their worries, and that all factors should be weighed in before deciding on anything.

A major part of the contacts with the CAB are based on opinions rather than scientific facts. The water councils (as mentioned earlier) are an excellent platform for spreading information and engaging in communication with the locals. The water councils might sometime even invite different lecturers as a way of spreading information. Regardless of which bases the opinions are expressed, the respondent sees all expressed opinions as important. It is essential to know what worries the locals, so that the CAB can make better decisions. The CAB cannot engage in a dialogue with every single individual, and therefore politicians and organizations are important when communicating with locals. In water council meetings the CAB has a possibility to listen to the single individual and is also embracing this opportunity.

"We do not have the possibility to communicate with every single person directly, but at meetings the single individual is especially important for us. That is our (CAB) chance to show that we are a trustworthy authority." (swe. vi har ju inte möjlighet att

kommunicera med alla enskilda på det sättet men vid enskilda möten så är ju dom såklart jätte viktiga att dom ska känna att LST är en trygg myndighet)

Some contacts have showed the CAB that not all can be treated the same. It would be essential for the CAB to assess the salience of their stakeholders, and out of the result create a strategy on how to approach the stakeholder. Some individuals are so energy consuming that they can be viewed as irrelevant, but everybody else is important. It is also important to assess whether the individual is speaking on the behalf of more people than himself. Sometimes it has been noted that certain individuals like to carry their own agenda in meetings than engaging in a dialogue. Lastly, the respondent notes that it would be essential to hear the passive voices such as women and youths. Momentarily it is only men of age that are involved hydro questions.

5.3 Analysis

The cases demonstrates how the CAB has decided to answer the application sent in by Fortum. On a general level one can notice that the CAB of Värmland are approaching the application on a strongly legal base. They are engaging in a strong argumentation with Fortum in each case, except Fryksfors. The result will be presented in compliance with the literature review presented in chapter 3. The application cases are analysed according to: whether the case is based on a social or environmental issue, how the EA of a specific case might challenge the SLO, what arguments seems to be the ground for the decision making at the CAB, and how has the case possibly created a social challenge

The analysis of the interviews aims to either confirm or disprove the findings of the case studies. The possible interviewees were few, and out of the possible number of respondents only two accepted the invitation for an interview. The result is still valid and reliable as the total amount of possible contacted interviewees were four (4). The answers of those who accepted are of high value for the study, as they give insight in the work of the CAB.

5.3.1 Kolsjö

The Kolsjö case was based on an environmental issues rather than social. The expected environmental impacts are positive, and no opposing opinions were found from locals. All stakeholders in the case were positive for the demolishing of the dam. Despite a positive opinion, the CAB of Värmland suggests that Fortum should be responsible for any natural drought that may occur in the area after the removal.

The EA was deemed as incomplete and was proposed to be remodelled. Fortum answered this claim by explaining that the EA is based on assumptions of how the area behaved before the damming, which was 200 years ago and cannot be easily assessed as there are no official documents on the topic. The EA was used as a tangible asset for the argumentation. The CAB of Värmland also argued that since the connective dam on land is left at the spot, it cannot be described as a total removal, it should be a partial removal. A partial removal would require other legal forms and another environmental assessment.

Opposition has earlier gained profit through "hard facts" (Anshelm & Haikola, 2016). The EA is a source of such hard facts. The EA serves a ground of argumentation for the CAB which can allow them to question the actions of the hydro operator. The proposed actions would improve the ecological status in line with what Vattenmyndigheterna mentions (See 2.1) and the energy strategy of the county, yet the CAB decides to oppose the action. Questioning the EA of an application such as Kolsjö, indicates that the CAB finds the SLO weak. The EA might in this case there affect the SLO negatively.

Related to the activity, the social strand has a positive or neutral approach. No opposition was introduced as the actions can be deemed a positive act for the environmental status in the area. The CAB of Värmland is representing the legal strand in the model. The legal strand questioned the legitimacy of the application and proposed improvements for the environment. The argumentation circled around the terminology of the application and environmental impact.

The argumentation by the CAB can be seen as an imbalance of power. The SIA literature suggested that the mediation processes may be prolonged because of imbalance in the power structure. The CAB could be experiencing that the power of the activity is not correct and are therefore requiring additional information. The imbalance would then lower the quality of the SLO of the activity, but not revoke totally as the other aspects of the platform is in approval of the activity. The SLO of Fortum is questioned by the legal aspect as the may lack legitimacy according to the CAB. A lack of legitimacy from the legal strand is most visual as long conflict mediations (Demuijnck & Fasterling, 2016).

Another possible reason for the argumentation is an engagement between the social and legal strand outside of the activity, which could affect how the CAB addresses the activity. The social affection could strive from an unheard voice, left out from the earlier engagement conducted by Fortum. Fortum invites stakeholders they assess salient to the first mediation meeting, which might exclude someone who personally assess themselves salient for the matter. They might still affect the outcome by addressing the legal strand. The CAB is responsible for the overall development of the county. That responsibility includes the overall assessment of opinions within the county. Therefore, they can include opinions of other stakeholders that are salient to them, but not to Fortum. This is

also an example of how social forces are more influential on the political agenda today than before, as mentioned in chapter 3.1.

The social challenge of Kolsjö remains between Fortum and CAB. As mentioned earlier, no opposition was introduced by the social strand. The situation could either have been improved with an earlier engagement of all stakeholders for the activity. This includes the legal strand. A mediation would allow all parties to start from the same knowledge base. Simultaneously, if a conflict assessment is done prior to the application it can be added to the EA. A SIA would show how the community would react to the change and allow the legal strand to act on it. Environmental changes will affect the social structures in a community (Tilt, Braun, & He, 2009; Peltonen & Sairinen, 2010).

5.3.2 Kvarndam

Kvarndam case is quite similar to the Kolsjö, as it assesses the removal of a dam which would increase the well-being of the ecosystem in the area, as it simultaneously would allow the water system to strive for good ecological status. Although, in the Torsby area the Kvarndam holds a special cultural importance and the locals opposed the removal of the dam, as a removal would destroy the cultural heritage of the area. Torsby municipality therefore asked Fortum to renovate the dam rather than demolishing it. The proposed action would have improved the environmental status of the water body, but the local opinions were strong enough to affect the outcome of the application. Thus, the Kvarndam case is based more on social issues than environmental. The EA was not mentioned in the argumentation of this case as it was focused on the social issue presented by the locals.

The CAB noted the opinions expressing the cultural importance of the area in their statement. They still argued that as the building itself is not of cultural heritage, the dam needs to be legally declared as an operation in water before anything can be executed on the dam. CAB gave Fortum the choices of applying for a complete removal of the dam or a permit to use the dam. Fortum strives to improve their corporate citizenship and suggested a new mediation meeting to find a solution which would serve all parties. Torsby municipality and Fortum came to a mutual agreement where Fortum renovates the dam and applies for the legalization of the construction, and then hands it over to the municipality.

The observation of the social strand in the requirements could be a way for the CAB to test the SLO of the activity and Fortum. The CAB still offered a possibility of including the cultural importance but gave Fortum the responsibility of making the decision. In case of a change in opinions it is not the legal strand that get the blame, but the activity and the ones in charge of the activity. The actions of CAB could therefore be described as testing the power structure within the mediation platform.

The activity overall can be seen to have approval from salient stakeholders in the social and economic strand, but lack approval from the legal strand. The reason for the lack of approval can stem from different analyzation of salient stakeholders, as in the case of Kolsjö, or an imbalance in the power structure in the mediation platform. CAB are most likely assessing Fortum responsible of engaging and considering the social aspect of the activity in their planning. By approaching this matter like this, they indicate that they (CAB) are maintaining their power position in the platform as the only ones legally able to admit or revoke permits.

In this application case, the mediation has been more active than in Kolsjö as there has been opinions expressed in a larger content. A thorough mediation would have allowed the CAB to note the situation, so that the municipality could have applied for the use of the dam instead of Fortum. The task of the CAB to turn laws into practice should not exclude stakeholder management. The CAB could assess their possibility to consider the social strand in a larger sense to receive more trust in their actions. SLO of a situation relies on the communities trust on both legal strand and the operator of the activity (Demuijnck & FASTERLING, 2016). Without it, the SLO of activity is questioned.

The situation could be improved with a SIA included with the EA, and by the legal strand to allow the social aspect to be included in the decision-making. Trust in the legal activities is as important as trust in the activity, for a project to become successful.

5.3.3 Liksjö

Liksjö dam served no purpose to Fortum and was found to have several weak points, which indicated an urgent need for reparation. The suggested actions would allow a stricter follow up on how the water moves in the area and in case any changes would occur to the area. The application itself was an environmental issue. The dam was in bad condition and needed urgent attention. The application became a social issue when the CAB found the dam to be without legitimate permits. The social strand expressed negative opinions of the actions, as it would modify the water level of the area. The EA is not affecting the SLO in this case, as the CAB declined Fortum from executing the actions based on ownership issues.

The CAB deemed that the dam is without ownership and that Fortum has no right to conduct any changes to the area, despite Fortum having made changes before. CAB stated that there is no legitimate proof that the Liksjö dam is in Fortum's ownership. Their decline of actions led to a removal of the damming properties of the dam, but not a full removal of the structure. The partial removal of the dam had negative consequences for both locals and the environment. Wells dried out, the water level of the lake lowered, which affected fishing, boating and shifted locations of beaches. The case shows how the local opinions were unnoticed in favor of legal requirements.

There was some opposition from the locals, as the lake is shallow, and a removal of the dam would indicate a drastically lowered water level which would affect both fish populations and locals negatively. In this application the CAB only considered the legal aspect of their task, excluding both the activity of the application and the social strand. The social strand was not included in the decision-making.

Liksjö case shows how the individual easily falls out of the process of SLO. Organizations cannot always portray the local opinion in such manner that it is properly communicated in a mediation process (Karjalainen & Järvikoski, 2010). Especially in a case such as Liksjö, which out of the description can be seen as a low interest case. The activity's SLO decreased as a result, when the social strand became unhappy with the result. The SLO of an activity is supposed to increase trust between the actors when properly communicated. The quality of the engagement is more important than the quantity. A proper communication would allow all parties involved to discuss about their viewpoints on the matter.

For the Liksjö application a mediation could have improved the situation significantly. A conflict assessment would have found that there is pressure and interest to engage in communication. A mediation would have shown how the community would react to a change in their environment. A SIA would have been helpful in the case.

5.3.4 Forshaga

In Forshaga Fortum planned to modernize the power plant structures to improve safety at the dam. The modernization would not have any long-term environmental impacts, nor affect the energy production. Fortum wanted to change the hatches for the dam and the process of opening the hatches from manual to digital. Local opinion reflected the safety during operation, but none expressed any concerns for the impact of the work. Merely the discussion surfaced concerning the spreading of diseases to fish in the area. The application of Forshaga is therefore an environmental issue rather than social.

The only opinions expressed for the application regarded environmental issues. Therefore, the EA can serve as a ground for argumentation. The EA served as a mutual platform on which a lot of the argumentation was based in Forshaga. The CAB would have allowed the actions if Fortum would have promised to apply for a new permit from the court and tighten the environmental actions proposed in the application. Based on their argumentation one can note that the EA was deemed too shallow. Fortum saw that the EA was detailed enough. The differentiation in the perspective of the EA shows that the SLO is not in balance.

The CAB proposed stricter requirements than proposed in the application and that Fortum needs to further explain how they are going to consider the fish population in the area. Simultaneously, CAB warned Fortum that they may forbid

the proposed actions as the changes are so comprehensive that the decision should be made by court and not the CAB.

The argumentation of the CAB is firmly based on environmental values. Though, as the application would not affect the energy production at the power plant the argumentation can be defined as a testing of power balance in the mediation platform of the activity. The proposed requirements and actions by the CAB can also be seen as a way for the CAB to test their own power in the mediation platform. By addressing the issue with further permits than the one applied for, the CAB shows that the application lacked the legitimacy and that the true legitimacy of the application is a case for a higher legal institution. There is also the possibility of communication between a social stakeholder and the legal strand that has not reached the operator of the activity.

Forshaga application could have been addressed more smoothly through mediation. There are clearly different knowledge between Fortum and the CAB which creates an unfortunate situation. This application lacks a social aspect overall. The social strand is not visible. This could mean that the proposed action does not have an impact as large as CAB argues it to be. It could also indicate that the communication with the locals have failed and an approval of the activity is not to be found. Regardless of which situation is more true, it could have been avoided with communication and mediation.

5.3.5 Fryksfors

The case assesses the rebuilding of the power plant, as it was outdated, and it was deemed a better use of resource to rebuild than to renovate. The rebuilding would not have any environmental impact changes, as the construction would be placed in the same area as the old one. The new construction would be even fish friendlier than the old one and was accepted by the fishing organizations in the area. The opinion expressed for the project were worried about the cultural damage of the landscape. The power plant building belonged to the cultural heritage of the landscape, as it had been standing since 1907. The municipality of Kil asked Fortum to do a precise mapping of the building and plan the new according to the same model as the old one. The Fryksfors application was primarily an environmental issue. The local opinion on the other hand wanted to preserve the cultural landscape in the area. Thus, the application gained a social aspect. In the Fryksfors it is the social aspect than might affect the SLO rather than the EA.

The CAB suggested a fish ladder as an improving aspect but revoked the suggestion when the court showed it to unnecessary since it had been revoked already in 1945. Fortum was allowed to proceed with the case as long as the old construction was mapped thoroughly with the cultural organization of Kil and the new built according to the mapping.

The CAB did not require Fortum for any further aspects or applications, even though this is the most comprehensive work of all presented. If Fryksfors would have been met similarly as the other cases, the probability of CAB requiring further explanations would have been high. The CAB would have had a chance to prohibit the building or argue that a more extensive EA should be concluded or similar. Though, they did not and Fortum could proceed with their plan. The activity seems to hold salience in the eyes of the legal strand as the application was approved without further requirements.

In Fryksfors a conflict has been avoided with a proper mediation and respect towards the social strand. Even though a SIA was not included in the EA, it is seen that the social opinions have an impact on the decision-making. The case avoided social challenge through mediation.

5.3.6 Interviews

Respondent A answered the questions on a slightly general level and Respondent B more precisely on hydro power. The interviews showed many similarities in how hydro power operations are perceived internally at the county, but also how external stakeholders perceive the county. Both respondents noted that the hydro power operators are feeling distressed by sudden attention on their operations. Respondent A argues that it is the reconstruction of legislation that causes the attention, whilst Respondent B argues that it lies in the importance of environmentally adjust the operations.

Both respondents argued that the distress is caused of a gap in knowledge. It would be essential for all salient stakeholders to communicate in a mediation platform to overcome this issue. Respondent A said that the CAB promotes these mediation platforms when needed, whilst Respondent B emphasized that the CAB should be more visible in mediation platforms. Respondent B noted that there is a gap between the CAB and their external stakeholders which challenges the relationship between the parties. The CAB has not been as active as they could have been. Their communication is lacking. Respondent A saw that the level of communication is satisfactory.

Renewable energy does not equal environmental friendly energy. Both saw that hydro power is a great source of energy but needed some environmental adjustments for it to be called "green". Respondent A mentions that the location of a power plant is key to whether it will be assessed as environmentally friendly or not. He further stated that as the hydro power is rather old in Sweden, location changes are hard to implement. From an energy and climate strategy perspective it would be of interest for the county to enforce large scale power plants. He saw that small-scale production may have to be demolished in favor of the environment, where the large-scale power plants cannot. Respondent B saw that the main threat was the alteration of habitats. She emphasized that the environmental adjustments

should be seen from which flowing waters can be restored in favor of the habitats. Both argued that a balance needs to be found between socioeconomic and environmental aspects for the best result.

Their answers regarding the local opinion was divided even if they both saw that the CAB have been portrayed negatively in media. Respondent A indicated that the overall opinion of hydro operations as positive and in line with the national opinion, whilst Respondent B indicated that there is a clear division in the local opinion. Regardless of how unified the local opinion might be, both respondents saw that the issue may lie more in the relations between the CAB and hydro operator, than the hydro operations. Respondent B claimed further that the gap is created by external stakeholders relying more on feelings than facts, whilst Respondent A argued that the issue lies in a knowledge gap. Both saw that the solution for the issue is to improve communication between parties and to actively share scientific knowledge for best result

6 RESULTS

Next the result of the study is presented. The result shows whether the objective has been reached. The objective of this study is: *This research aims to find an indication whether local opinions are affecting decision-making of hydro operations permit applications at the CAB in Värmland.* The result is derived from the analysis presented in the last chapter. The result will be presented according to the sub-research questions for the study.

How has the CAB argued for their decision?

Out of the presented analysis one can note that the CAB have a strong legal approach towards presented applications. Their argumentations were related to environmental awareness as much as the correct legal approach to presented application. One can note that by such a strong argumentation towards the hydro operator, which in this case has been Fortum, can be seen as a questioning of their SLO.

The interviews noted that the communication has not been as good as it could have been in the applications. Internal inertia and power imbalance in the mediation platform hinders the CAB of conducting major social changes to include the social aspect in a larger content than momentarily possible.

How can the situation be described with the theories of SLO and SIA?

The case result shows that there exists an imbalance in the power structure related to the activity, and that there exist a possibility that external opinions are affecting how the CAB chooses to act upon the applications. The three-strand model showed that something might affect the decision making that has not been taken in account for the activity itself.

The interviews showed that the problem is not that opinions are affecting the decision-making. The problem is that the communication between Fortum Sweden and the CAB in Värmland is limping and that there might be internal inertia at the

CAB that hinders a fruitful communication. The mediation platform on which the SLO and relationship has been placed is in imbalance as the economic strand has actively meddled with the legislation. The coming change in legislation has put the power balance in question, as no party involved knows how the power will be structured after the new law has been implemented

How would a social impact assessment affect the situation?

The interviews noted that the CAB has received negative attention in media and that there is gap in knowledge when it comes to renewable energy sources. SIA would decrease the gap in knowledge and thus improve the application process. Mediation would allow a shared knowledge between all actors and thus improving the decision-making. Mediation would also improve the trust in both operator and legal strand, simultaneously increasing the approval of the SLO.

The application cases showed that a mediation is necessary. The current imbalance in the power structure must be corrected to avoid future problems.

The analysis show that the current issue between hydro operators and the CAB lies in limping communication due to imbalance in the power structure. This means that the hydro operators are no longer the stronger party in the discussion as environmental awareness is rising in importance. The new legislation and media attention has started the imbalance. Though, as the new legislation is set and the CAB starts to implement it through permits, the power structure will be found again. The result of the study is thus that the social aspect has little influence on the decision-making in Värmland. The interviews disapproved the statement by stating that the communication is limping between several parties, and that there might exist internal inertia at the CAB. The result also showed that the environmental aspect is used as a base for argumentation in the application discussion. The environmental aspect is thus a highly valued aspect in the application cases.

SIA serves as a good ground for assessing how the social aspect views the actions of both operator and CAB. Therefore, a mapping of possible conflicts for a project could be executed with the EA. EA has been a shared platform for mediation for separate cases. If a SIA is added it broadens the sustainability aspect of the application and thus improving the possibilities of a strengthened SLO. The CAB puts a lot of value on the environmental assessment and inclusion of the social aspect would increase the probability of the CAB noting it in their decision-making.

7 DISCUSSION

The research problem has derived from a differ in opinion regarding utilization of free-flowing water. Hydro power has long had an untouched position in the Swedish energy mix but is now facing a new situation. The hydro power industry has indicated that decision made by the CAB in Värmland bases their decision on opinions rather than facts. This study has assessed how the social aspect has been considered in the decision-making process at the CAB in Värmland to confirm or disapprove the indication of the industry. The result show that the argumentation of the CAB relies heavily on environmental and legal issues rather than social aspects. The responsibility of considering the social aspect is thus moved to the operator, which in this study is Fortum.

Vattenmyndigheterna suggested in 2014 how different authorities may cooperate so that Sweden could reach the 2040 goal of becoming independent on fossil fuels. In the protocol it was stated that one of the main missions for the CAB is to monitor the hydro operations in the county. The CAB is supposed to find those constructions and operations that are acting as obstacles in the water body and suggest improvements for them. The appropriator letter from the government also states the importance of monitoring the environmental well-being in the county. Even if the CAB has many missions to work with, monitoring the environmental aspect seems to be highly valued. It is important for the CAB to fulfil their task as legal supervisor in hydro matters. Though, their larger responsibility is to monitor the regional development of the county. A positive development in the county would require a good ground for engaging in mediation processes regarding several different activities.

The hydro legislation has been untouched for 100 years in Sweden and it has allowed the hydro operators to become comfortable with the situation. The actions of hydro power plants have not been questioned before the discussion of a new legislation. The applications showed that opinions might have been impacting the decision-making through mediation during the Fryksfors case. The activity has

been accepted and approved, and therefore also having a SLO. During the Fryksfors case, the discussion regarding a new legislation had not begun and the power structure was still in balance.

During the other cases (Kolsjö, Kvarndam, Liksjö, and Forshaga) the discussion regarding the rearrangement of the legislation had started. The change in legislation has put power structure out of balance in the mediation platform. That means that power distribution within the mediation platform has changed. The legal and the economic strand are affected by the change in legislation as their power may fluctuate with the new law. The operators and the legal strand must communicate openly about their interest in hydro power to reach agreements.

The cases showed how the CAB approached the proposed actions from a strongly legal viewpoint. As their responsibility is going beyond the legal aspect, they should strive to approach hydro applications from several aspects. There are several aspects affecting the outcomes a project and the result of decisions is balancing the different impacts and assessing which impact is the most favorable (Anshelm & Haikola, 2016). Even further for the CAB, it is not only the environmental consequences, but rather the sustainability consequences. The CAB should assess the sustainability consequences base on the triple bottom line to improve their future legal suggestion.

The CAB could require the company to increase stakeholder management and require SIAs to be included in the EAs. SIAs allow the institutions to assess whether the company has understood the county's environmental goals and is willing to contribute to the sustainable development in the county. By studying how the locals act towards new projects of renewable energy in the county, the institution may assess a general opinion of which interest lie at hand and then further suggest how the company can address the situation to increase approval in the area.

The application cases also showed that there exists an imbalance in the power structure. The power balance might be causing the strong reactions and should be attended. When a balance is found, the SLO for the project will be obtained and the possibility of mediation is introduced. Mediation is an important part of stakeholder engagement for all stakeholders involved. Mediation allows the stakeholders to create relationships and avoid further social conflicts.

A balance in the power structure would allow stakeholders to be included earlier in the projects, and thus even further avoid conflicts. An early involvement in the project allows the operator to map the concerns of the locals and adapt the plan accordingly. Thus, the SLO for both industry and activity is maintained. Simultaneously, as Owen & Kemp (2013) state that equal access to the same information increases the possibility of a successful SLO framework and mediation. Same information and starting point for all parties involved allows the mediation to develop more successfully. A balance in the power structure could be visual as open communication with all involved stakeholders.

In practice this would remind of the situation in the Fryksfors application case where a decision is made with the impact of all parties involved in the project. A power structure balance can be noted on the easiness in communication. To reach such easiness it would be necessary to have a shared language with everyone involved. In the beginning of any mediation process it should be mentioned what each term means in that specific context. The shared knowledge base and shared language thus allows a fruitful mediation. As Peltonen & Sairinen (2010) mention, administrative approaches can easily become tiresome. Mediation before a project would then decrease the use of resources needed and reach an agreement suitable for everyone.

SLO is a complex and intangible theory with many different approaches. SLO is despite that a suitable way to approach questions regarding problems that has occurred at operation sites for companies with activity that may cause harm to the environment or the social structure in the area. The result of the study showed that the SLO can be combined with SIA to describe how different stakeholders may react to a proposed hydro power activity. SIA then describes how the engagement and communication between different SLO strands can be described as a mediation platform, to further realize how the relationships are distributed within the SLO system.

SLOs intangibility can be addressed with EA and good stakeholder engagement. As can be noted in the application cases as well, EAs can serve as a base on which argumentation can be held when the mediation platform lacks another ground. EA serves as a shared knowledge base for the activity. Therefore, it could be useful to introduce SIAs into to the EAs, so that the legal strand would be aware of the social strand's viewpoint and adaptability before beginning the process of deciding.

For hydro operators as Fortum the situation could be improved by addressing the environmental and social aspect of their own sustainability. CSR is mentioned as a satisfactory way to communicate with larger groups of stakeholders and to increase transparency and trust. CSR reports communicate about actions taken by companies to increase sustainable business. Sustainability actions could be engaging in corporate citizenship, improving safety for employees, and decreasing the environmental impact of the company. CSR reports have been accepted by many managers as an effective and profitable aspect to engage in, which has led to a spreading trend. Most companies are publishing CSR reports today.

Fortum mentions in their sustainability report that corporate citizenship is important for them. Corporate citizenship is a suitable way to manage stakeholder relationships on a local level. In 2017 the report was published in Finnish and in English. Though, if Fortum values corporate citizenship as mentioned in their sustainability report, the publication language should reflect the local preferences. Publishing the report in the local language would increase transparency as Fortum

shows that they want to engage the local stakeholders in their actions. A report in the native language would allow external stakeholders to reflect upon whether Fortum as a company and operator of the activity in their premises, share the same values as they do.

A report in native language could increase the shared amount of information amongst the stakeholders, improving the possibilities for mediation platforms. In the light of the research problem and proposed theories, the actions of Fortum lack legitimacy. Fortum has attempted to address this issue with reporting separately about the hydro power sustainability issues in Swedish. If it is enough to gain legitimacy is still to be observed. A Swedish sustainability report from Fortum would be a first step on improving the communication. The mediation platform would thus be more fruitful as the company is honest about their actions and everybody within the mediation platform can take part of it.

As the study is only assessing the decision-making in Värmland, the results are not applicable to other CABs in Sweden. Though, if there are similarities in other counties, the results of this study can be used as a base to understand why the problem occurs. The study was not able to assess every single opinion regarding the applications, and thus some social aspect might have been left out.

The study showed that every SLO is context bound. It is also of importance for operators in a community to openly involve in communication with both legislative force and the social strand. Only through good mediation can fruitful decisions be concluded. Opinions are taken in consideration in different measures in decision-making processes. Though, in this study the power structure does not allow a satisfying mediation. An added SIA to an EA for a project would allow the CAB to consider the social strand's standpoint more closely. The EA is given great value at the CAB, as it can be used as a tangible base for discussion with the company. The EA also present "hard facts" which are measurable. SIA does not give hard facts, but sheds light on how the locals perceive the situation.

Even though, the result showed that the social strand has mostly been excluded in decision-making processes at the CAB the possibility of an external opinion affecting the result cannot be excluded. The three-strand model shows that there is constant communication outside of the mediation platform. This study only looked at the communication included in the mediation of an application, and thus cannot be sure that an external opinion has affected the outcome. Although, based on the result of this study, it is highly unlikely that an external opinion has affected the outcome as the argumentation has mostly regarded legal and environmental assets.

Therefore, futures studies could look at the internal culture at the CAB and how it possibly affects the engagement with stakeholders. The interviews showed that there is some involvement between the CAB and stakeholders, but it needs polishing. Future studies could also look at differences between counties in Sweden.

8 CONCLUSION

The new legislation which is under construction in Sweden, is most likely to suggest a retrial of all hydro operations, so that the hydro operations can be matched with new regulation. The actions of the CAB can then be seen as an early retrial of the hydro power plant permits. By addressing the applications with stricter environmental requirements, the permits can be seen as retried and does not need another retrial further on.

The aim of this study was to find an indication whether local opinions are affecting decision-making of hydro operations permit applications at the CAB in Värmland. The result and discussion showed that the reason for the problem is a rearrangement in the mediation platform as the legislation is changing rather than opinions. This rearrangement has created an imbalance in the power structure causing issues with the applications and mediations. The three-strand model presented by Gehman, Lefstrud, and Fast (2017) indicates that there might be a possibility of external opinions affecting the decision-making. If it has happened, it has happened outside the mediation platform. Thus, it can be stated that in this specific county within the limits of the study, local opinions were not the reason for the application decisions. The reasons for the decisions were a strong mission of upholding a legal framework and environmental interests.

The social aspect was included if there was a strong local opinion. Though, the responsibility of considering the opinions fell on the activity operator rather than the CAB. The CAB engaged in a discussion with the operator through their EA. The EA and the legal framework then worked as argumentation tools in the applications for the CAB. The social aspect can then be seen as more excluded than included in the decision-making.

In the environmental strategy report for Värmland county, it was stated that the application processing system needs an update. If an update has happened since the publication is not in our knowledge, but based on the result of the thesis

there has not been a major change. Merely, the problem stems from the change in the legislation which has put the mediation platform out of balance. According to the theory of SIA, stakeholder engagement is important and the best way to involve salient stakeholders is through mediation. Though, mediation can only occur if there is a need and the power structure is in balance.

Stakeholder engagement is important for upholding a SLO too. SLO is an intangible license for companies to track their acceptability in the community they are active in. SLO can also be seen as a constant communication regarding a certain activity. The acceptance is then directed at the activity rather than the company itself. Together, SLO and SIA has provided a sufficient background for studying the situation with permit applications in Värmland county.

Quoting Brundtland (1997): *"Politics that disregards science and knowledge will not stand the test of time. Indeed, there is no other basis for sound political decisions than the best available scientific evidence"*. Permits and legal decision should be conducted on the best evidence available. One way of finding the best available evidence is through shared knowledge between involved parties. Shared knowledge allows a broader view of how an issue is observed from other viewpoints, and thus understanding the actions of the other party.

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APPENDIX

Appendix 1: Summary of pre-discussions

Appendix 2: Interview questions

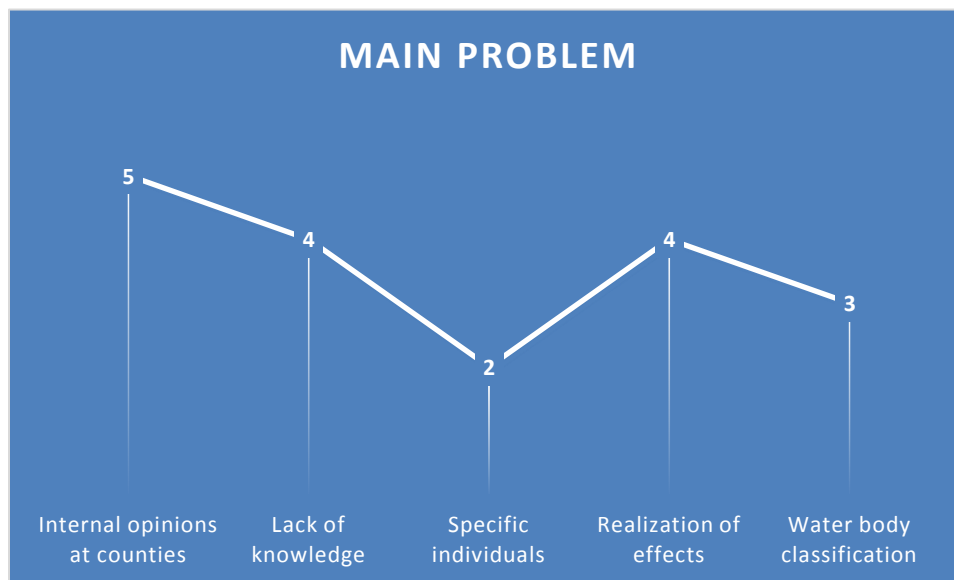
Appendix 1

A summary of opinions expressed during a pre-study discussion meetings.

Issue/ Respondent	1	2	3	4	5	6	7	8	9	10	Sum
Lack of knowledge		1		1	1			1			4
Värmland	1			1				1	1	1	5
Internal opinions	1	1		1	1			1	1	1	7
Värmland lawyer				1				1			2
Retrial		1		1				1			3
Legislation		1		1	1	1		1			5
Lack of communication			1	1				1		1	4
Tailoring of water bodies			1	1		1	1				4
Kammarkollegiet				1							1
Environmental impact		1	1	1	1	1	1				6
Long legislative processes				1							1
Consequences of demolishing hydro power plants		1	1	1	1	1					5
Acceptance			1			1	1				3
Importance for fighting climate change							1				1
Fish							1			1	2
Consequences of their decisions		1		1				1	1	1	5
History			1	1		1		1			4
Big picture		1	1	1	1						4

What is the biggest problem/ Respondent	1	2	3	4	5	6	7	8	9	10	Sum
Internal opinions at counties		1		1				1	1	1	5
Lack of knowledge		1		1	1			1			4
Specific individuals				1						1	2
Realization of effects				1	1			1		1	4
Water body classification			1	1		1					3





The table and the pivot figures shows how the research problem is viewed within Fortum and what they deem to be the largest issues. Many issues were mentioned, but noteworthy are internal opinions and environmental impact. The environmental impact indicates that the impacts of actions are not known by the county administrative board before making a decision. The internal opinions shows that it has been noted that the CAB of Värmland might act regarding own personal interests rather than for the best of the community of Värmland.

Appendix 2

Interview questions used for the research are presented below in English. The questions are translated from Swedish. The original questions are included.

Introduction of me and the topic

Introductory questions:

- Could you present yourself (education and career) and what you are doing at the CAB of Värmland
- How is the CAB responsibilities visual in your work
- Have you met difficulties of implementing them? what kind?

Green Energy:

- How do the CAB define green energy?
- What aspects are emphasized in evaluating green energy? are these relevant according to you?
- What is the CAB doing to increase the percentage of green energy in county
- Can hydro power be considered green energy on these requirements?
- What could be done for hydro power to meet the requirements?
- Do you consider that the CAB holds an important role in this matter

Opinions

- Do locals contact you regarding energy matters? And if, what are their major concerns?
- How would you describe the local opinion? Is it unified?
- What kind of contact is most relevant? why? Do you have an example?
- Are there any irrelevant contacting?

The interview questions in Swedish:

Introduktion av mig och min undersökning

Introducerande frågor:

- Skulle du kunna beskriva dig själv (utbildning och karriär) samt vad din huvuduppgift vid länsstyrelsen är?
- Kan du beskriva en vardag på jobbet
- Hurdana motgångar möter du i ditt jobb?

Grön energi:

- Hur definierar länsstyrelsen "grön energi"?
- Vilka aspekter betonas när man definierar grön el? Är dessa relevanta enligt dig?
- Vad gör länsstyrelsen för att öka andelen grön el i länet?
- Anser du att vattenkraften kan definieras som grön el?
- Om inte, vad skulle måste göras för att vattenkraften skulle uppnå statusen som grön el?
- Hur uppfattar du länsstyrelsens uppgift angående detta?
- Hur skulle du beskriva förhållandet mellan länsstyrelsen och energi producenterna i länet?

Opinion:

- Tar lokalbefolkning kontakt med er gällande energifrågor? Vilka är deras största bekymmer?
- Hur skulle du beskriva den lokala opinionen? Är den mycket splittrad eller enhetlig?
- Vilken typ av kontakt är mest relevant? Varför? Har du något exempel
- Vilken typ av kontakt är irrelevant? Varför? har du något exempel