Sveriges lantbruksuniversitet
Fakulteten för skogsvetenskap

Institutionen för skogens produkter, Uppsala

Bioenergy from the forest – a source of conflict between forestry and nature conservation?

– an analysis of key actor's positions in Sweden

Ida Wallin

Examensarbeten
Nr 97 2012

ISSN 1654-1367

Sveriges lantbruksuniversitet
Fakulteten för skogsvetenskap

Institutionen för skogens produkter, Uppsala

Bioenergy from the forest – a source of conflict between forestry and nature conservation?
– an analysis of key actor's positions in Sweden

Ida Wallin

Nyckelord: bioenergy/bioenergi, forest/skog, policy, nature conservation/ naturskydd, actor/actor, governance/ governance, discourse/diskurs

Examensarbete, 30 hp *Avancerad nivå i ämnet skogshushållning (EX0660)*
Jägmästarprogrammet 06/11

Handledare SLU: Sara Holmgren
Examinator SLU: Daniela Kleinschmit

Sammanfattning

Bioenergi från skogen har varit en omdebatterad fråga i Sverige under flera decennier. Viktiga faktorer som påverkat debatten om förnyelsebar energi är samhällets intresse av minskat oljeberoende, säkrad energiförsörjning, en konkurrenskraftig ekonomi samt även begränsning av miljöpåverkan och andra effekter av klimatförändringar. Sverige har en lång tradition av att utvinna energi från skogsråvara, men den egentligen användningen av skogsråvara för energi anävdning har sett olika ut över tid. Den ökade anvädningen av bioenergi från skogen i Sverige under de senaste decenniet har underlättats av redan existerande, starka aktörer. Skogssektorn i Sverige karaktäriseras av 'frihet under ansvar' och privata akötrer inom skogs- och naturskyddssektorn har spelat en viktig roll i debatten men också för utformningen av de politiska sektorsmålen. Aktörer agerar utifrån egna intressen och värderingar och förståelsen av privata aktörers agerande är avgörande för att förstå utvecklingen av bioenergifrågan i Sverige. I studien identifierades representanter för ägande-, industriella- och naturskydds intressen och utefter vissa kriterier utsågs tre nyckelaktörer nämligen; Skogsindustrierna, LRF Skogsägarna och Naturskyddsföreningen. Syftet med studien var att beskriva utvecklingen av dessa tre nyckelaktörers positioner inom bioenergifrågan under tidsperioden år 2000-2010. Positionerna och dominerande diskurser identifierades medelst textanalys av remissvar.

Resultatet av studien visar att alla tre nyckelaktörer var överens om att den svenska skogen måste bidra mer till energiförsörjningen. Nyckelaktörerna fortsätter dock att uppvisa motstridiga positioner i huvudsak vad gäller genomförandet av regleringar och restriktioner. De dominerande diskurserna bland aktörerna var "Bioenergi från skogen och Miljön", "- som en Affärsmöjlighet", "- Regleringar och restriktioner" samt " samt "- Klimatförändringar". Resultaten bekräftar tidigare vetenskapliga studier av Ottosson (2011) och Lindkvist m fl (2011) som visat att skogsindustrierna och större skogsägare kanske argumenterar på ett nytt sätt i dagens debatt men de är fortfarande mest intresserade av makten över, och friheten att kontrollera den skogliga resursen. Samtidigt kan inte, enligt stora delar av miljörörelsen, lönsamhet och produktionsfaktorer motivera ett risktagande rörande skyddet av ekosystemet och biodiversiteten.

Det existerar endast begränsade möjligheter för besultsfattare att finna synergier och praktiska lösningar vad gäller förverkligandet av skogens bioenergipotential och det ökade uttaget av biomassa från skogen för energi. Framtida studier av aktörers positioner inom frågan om bioenergi från skogen skulle gynnas av att undersöka aktörernas egentliga maktmedel och deras möjligheter till att driva igenom sin syn på skogsbruk i skogen. Mer tekniskt inriktade studier skulle gynnas av att identifiera vilka tekniska lösningar aktörerna föreslår och om dessa eventuellt är praktiskt förenliga med varandra.

Nyckelord: *bioenergi, skog, policy, naturskydd, aktör, governance, diskurs*

Abstract

Bioenergy from the forest has been heavily debated in Sweden for several decades due to the interest of society to decrease dependence upon fossil fuels and limit the effects of climate change. The actual use of bioenergy from the forest has shifted over the years but increased during the last decades. Private actors within forest and nature conservation sectors play an important role for the development of bioenergy from the forest as well as for the debate and the implementation of political goals. Forestry in Sweden is characterised by 'freedom under responsibility' for private actors and the perspective of governance is valuable for studying actors and discourses. Actors have their own interests and goals and the study focuses on three key actors representing ownership, industrial and environmental interests respectively. The aim of the study is to describe how the key actor's positions concerning bioenergy from the forest have developed between years 2000-2010. Positions and dominating discourses were identified by text analysis.

All the key actors in the study agree that the Swedish forest has to contribute more to the energy supply. The key actors however continue to have opposing positions regarding the implementation and the main conflicts are regulations and restrictions. The results of the study confirm earlier scientific findings that representatives of the forest industries and forest owners might argue in a new way but they are still mostly interested in power and the freedom to control the forest resource. At the same time, for large parts of the environmental movement, the profitability and production factors cannot motivate risking the protection of the ecosystem and biodiversity. For decision makers there are limited possibilities of finding synergies and practical solutions concerning the realization of the potential and the increased extraction of biomass from the forest for energy purposes.

Keywords: *bioenergy, forest, policy, nature conservation, actors, governance, discourse*

Preface

This paper is a master thesis in forest science written during the 9th and 10th semester at the Swedish program for forest science (swe. Jägmästarprogrammet) given at the Swedish University of Agricultural Sciences.

The study combines social and natural science – as well as forestry, bioenergy and policy issues. For a forestry student it has been a great journey for new knowledge and new insights – especially into the field of political science. I wish to thank everyone that has helped me to put all the pieces together:

Viveca Sjöstedt & Sara Holmgren,
- *both my 1st supervisors and guides into the un-known land of political science, for their support and patience.*

Vilis Brukas
- *my 2nd supervisor, for valuable discussions and insights, and for contributing with a more senior forester perspective upon the study.*

Karin Ericsson at LRF Skogsägarna
Jonas Rudberg at the Swedish Society for Nature Conservation
Mårten Larsson at the Swedish Forest Industries Federation,
- *for their invaluable cooperation and supply of relevant research material.*

Friends and family,
- *for their continuous support in every kind of way.*

Contents

Technical terms

Black liquor: (swe. svartlut) a bi-product when cooking wood chips into chemical pulp. It has high energy content and consists of dissolved lignin, other wood components and cooking chemicals (Åström et al 2011).

Bioenergy: energy from biomass originating from various sources such as forest or agriculture. Bioenergy from the forest will in this study be equal to solid biomass taken from the forest for the direct purpose to be used as energy.

District heating: (swe. fjärrvärme) large scale technical heating systems including production and distribution of heat to many consumers within a geographical area, often within whole urban areas.

GROT: abbreviation in Swedish of branches (swe. grenar) and tree tops (swe. toppar) (Swedish forest agency 2011a).

Policy (pl. policies): Policy is to be understood in a broad sense as including both hard and soft law and forest policy is here defined according to Krott (2005, p.12); *"Forest policy is that social bargaining process which regulates conflicts of interest in utilizing and protecting forests according to the programs of the forest sector"*.

Proposal referred for consideration: (swe. remiss) process involving the referral of a legislative or other proposal to selected bodies for consideration and comment. These may be public authorities, local government authorities, NGOs, advocacy groups or voluntary associations (Government Offices of Sweden 2012a).

Referral body: (swe. remissinstans) selected bodies for consideration and comment of governmental proposals (Government Offices of Sweden 2012a).

Renewable energy: energy from renewable sources (not fossil), for example hydro-, wind- or bioenergy.

Organisations & abbreviations
Swedish Forest Industries Federation (SFIF): swe. Skogsindustrierna (SI)

Swedish Society for Nature Conservation (SSNC): swe. Naturskyddsföreningen (NSF)

The Federation of Swedish Family Forest Owners (LRFS): swe. Lantmännens Riksförbund Skogsägarna (LRFS).

Ministry of Enterprise, Energy & Consumption: swe. Näringslivsdepartementet
Ministry for Rural Affairs (earlier; Ministry of Agriculture): swe. Landsbygdsdepartementet (fd. Jordbruksdepartementet)
Ministry of the Environment: swe. Miljödepartementet
Swedish Forest Agency: swe. Skogsstyrelsen
Climate Committee: Klimatberedningen

1 Introduction

1.1 The development of bioenergy from the Swedish forest

Sweden has a long tradition of utilizing forest biomass for energy purposes (Björheden 2006). Oil became the dominating energy source after the Second World War, but the oil crisis at the end of the 1970's gave a renaissance to bioenergy. The large potential of bioenergy from the Swedish forests was then once again recognized. The public resistance to exploit more rivers for hydropower and the referendum in 1980 to phase out nuclear power until year 2010 further urged the promotion of bioenergy. The development of bioenergy from the forest in Sweden once again gained prominence when the assumed shortage of wood fibre (swe. *virkessvackan*) was proved untrue in the 1980's (Ericsson et al 2004; Björheden 2006). At the same time new environmental concerns came into focus such as the oak death and acid rains. Climate change entered the political agenda in the early 1990's and the reduction of greenhouses gases is a major issue for the society today. Tools for combating the climate change often refer to the forest as a carbon sink; by afforestation or as a substitute for fossil fuels and other non-renewable materials carbon can be stored in the forest biomass. The interest in the forest from society has increased hand in hand with the demand for bioenergy. The increase in the utilization of bioenergy in Sweden has been facilitated by the existence of resourceful actors responding to policies and the already present infrastructure of the forest industry and district heating systems (Nilsson et al 2004). Without the actors' realization of bioenergy from the forest as a business opportunity there would not have been such a rapid increase of bioenergy utilization in Sweden (Björheden 2006).

The change of actors' attitudes was not an expected development at the beginning of the 1990's when the promotion of bioenergy encountered strong resistance from the forest industries in Sweden. At that time they expressed great concerns about the competition over raw material and possible higher energy prices (Björheden 2006). The forest industry has since then gone through a transition and redefinition of itself resulting in a change of positions (Ottosson 2011). The forest industries are today positive towards bioenergy from the forest. The change is partly explained by the increased political support of nuclear energy in Sweden as domestic nuclear energy is regarded as securing the domestic energy supply and keeping the price of electricity low (Anshelm 2009 in; Ottosson 2011, p. 64). Electricity is a major production cost for pulp and paper industries. The introduction of electricity certificates in 2003 gave further incentives to the forest industries that bioenergy from the forest could be seen as a business opportunity and not a threat. Adding to the change of positions was the realisation that there was no deficit of forest raw material. On top of that, the influence of the environmental movement, scientists, interests groups and the general public had an impact on the industries position (Ottosson 2011).

The environmental movement and nature conservation interests have since the 1970's played an increasingly important role in the forest related discourse in Sweden (Bush 2005). With the participation in certifications schemes and increased environmental awareness the importance of environmental interests have reached a relatively influential position in Sweden today.

The ownership rights are strong in Sweden and around half of the forest land is owned by individual forest owners with an average forest estate of 45 ha (Swedish Forest Agency 2011b; Swedish Forest Agency 2008). The individual forest owners are therefore a major interest group when discussing the utilization of the forest resource in Sweden. General interests of forest owners are maintaining one's own authority over the forest asset and the sustainability of economic values as well as sentimental values (Krott 2005, p 46-51). From a

socio-economic point of view the optimal use and the highest price on the forest resource is reached by free market forces (Brännlund et al 2010). The winners of the increased interest in the forest resource are predicted to be the forest owners and the losers are primarily the saw-timber and pulp industries.

In this context it is important to consider that conflicting positions between actors will delimit the expansion and development of renewable energy from forests. Even though, during the last two decades the actors, participating in the debate concerning intensified forestry, have increasingly come to resemble one another in terms of their respective attitudes and rhetoric, they still maintain conflicting figures of thought and core values (Lindkvist et al 2011). The forest industries and major forest owners are still mostly interested in power and the freedom to control the forest resource. Profitability and production factors cannot motivate risking the protection of the ecosystem and the biodiversity according to large parts of the environmental movement. They instead promote control over the forest resource from society.

The forest will have to contribute to the energy balance in Sweden but how and to what extent is still heavily debated. There are several technical and non-technical aspects to take into consideration trying to estimate the forest's potential contribution to Swedish energy supply. Research made on barriers and drivers of renewable energy claim that policies and non-technical challenges are most important for realising the goals of society (Nilsson et al 2004; Ed. Energy policy 2006; McCormick & Kåberger 2007). Actors have their own interests and drive the policy in order to realize their own goals first hand. The understanding of actors as drivers of the development of bioenergy is crucial. Energy companies and governments as well as biomass suppliers are actors of outmost importance for the future development (McCormick & Turkenburg 2007). Nilsson et al (2004) concluded that the technological research, development and demonstration (RD&D) needs to be complemented by studies of policy, markets, actors and systems as these are the main drivers of the market demand and consequently drives the development of bioenergy. It is however easy to agree politically on the importance of RD&D but more difficult to agree on measures that will affect actors and markets directly.

Conflicts between actors are one potential limitation to the expansion and development of renewable energy (Nilsson et al 2004). Information that might limit the impact of conflicts and increase mutual understanding is of highest importance for decision makers in this situation.

1.2 Bioenergy and forest policy in Sweden – an overview

There are four general aims to policies concerning bioenergy in Sweden as well as on international and regional level (McCormick & Kåberger 2007; Johansson & Turkenburg 2004; Ericsson et al 2004; Björheden 2006):

1. Decreased dependence upon fossil fuels
2. Security of energy supply and the competiveness of economies
3. Reduction of environmental impacts and limitation of the climate change effects
4. Regional development

The most relevant EU- directive today is the so called RES-directive from year 2009 (European Union 2009). The overall share of energy from renewable sources for all the member states together is to be 20 % and 10 % in transport by year 2020. The individual targets states that Sweden is committed have a renewable energy share equal to 49% until year 2020 (Government offices of Sweden 2010). The national Swedish target is however more

ambitious and dictates at least 50% share of renewable energy by year 2020 and at least 10% in transport. The long-term goal is a vehicle stock independent of oil by year 2030 and no net emission of greenhouse gases by year 2050 (Government offices of Sweden 2012b). In year 2009 the share of renewable energy in Sweden was 47% and the bioenergy share was 29% of total final energy consumption.

Bioenergy has been given continuous support in Sweden even if national policy tools such as taxes, subsidies, research and development funding has shifted focuses and scope many times over the years (Ericsson et al 2004). High national taxes on fossil fuels are one of the main drivers contributing to the rapid increase in utilization of biomass for energy. A market based policy instrument in the form of electricity certificates were introduced in Sweden year 2003 and was planned until year 2016 but has now been extended and prolonged until year 2020 (Nilsson et al 2004; Government offices in Sweden 2010). The certification system favours bioenergy to a large extent and has become an important income source for the pulp and paper industry and especially for the producers of black liquor.

The Swedish national forest law from 1993 was influenced by the new environmental awareness during the 1980's but also the realisation that there was an over production of forest biomass (Bush 2005; Enander 2007, p. 287-298). The present forest policy originating from then is characterized by 'freedom under responsibility' for private actors to fulfil the sectorial goals and at the same time dictates total equality between production and biodiversity. This total equality between the goals of production and biodiversity changed in year 2006 when a governmental investigation shifted the direction of Swedish forest policy once more towards emphasising the production of the forest and wood biomass with the motivation that there was no longer an over production of wood biomass. More recently the Swedish government in year 2008 proposed an enhanced consideration of climate change and its impacts on the forest ecosystem and forest sector (Swedish government 2008). Their prediction of the future includes both possibilities, with increased and stable growth of the forest biomass, but also threats to forest health and forest practice. The government also states that increased growth of the forest leading to carbon sequestration in growing trees and in final products as well as increased production of biofuels is positive for combating climate change. The government regards it as necessary with an increased extraction of forest biomass for avoiding negative consequences for the international competiveness of the Swedish forest industry. One possible consequence of this desired development will be more target conflicts in the forest.

1.3 Study aim

The interest of this study is to describe the positions of key actors in Sweden considering the issue of bioenergy from the forest since it is assumed that conflicting positions will delimit the expansion and development of renewable energy from forest. Possible conflicts between key actors and their interests are to be identified. The scope of the study has been limited to the period between the years 2000-2010, a period during which the issue of bioenergy from the forest appears to have become increasingly important and referred to by the different parties active in the debate (cf. Ottoson 2011).

2 Theoretical Considerations

2.1 Governance and the role of the state

The Swedish forest sector is as pointed out in the introduction characterised by 'freedom under responsibility', which is an expression for increased responsibility for private actors to fulfill the political goals of the sector. The government use information tools rather than strict regulations in order to achieve the desired development. The government also encourages other soft policy tools such certification schemes. The system is comparable with one ideal-type of governance called 'regulated self-regulation' put forth by Knill and Lehmkuhl (2002) and described as; where interactions are characterized by cooperation between private and public actors, where private actors participate in the policy-making process but the public actors are still responsible for providing public goods. This description of the Swedish forest sector is very simplifying but provides a basic understanding of the system to be analysed. The complex system, including public and private actors, political landscapes and interdependencies and so on, is covered by the theory of governance. Governance is however a complicated term and is used in many contexts and with many meanings. The definition of social-political governance brought forth by Kooiman (2000) includes *"arrangements in which the public as well as the private actors are aiming at solving societal problems and create societal opportunities"*. This is a very wide definition of the use of the term governance but the perspective of governance as an organizing framework of reality is valuable to researchers and politicians. Stoker (1998) argues that the governance perspective provides *"a framework for understanding changing processes of governing*" and that it can help identifying what is worthy of study.

To use the perspective of governance it is necessary to recognize the basic notion of governance; that changes in society have brought forth changes in the political landscape (Kooiman 2000). Governance is in fact a reaction to growing or changing societal interdependencies. The role of the state is no longer to rule by centralized control and regulation. In the contemporary society the state is instead relying heavily on informal authority such as negotiation and co-ordination. This change of the state's role should not be interpreted as a decline of the state's power. Governance needs government and settled institutions in order to be efficient (Hirst 2000). National government plays the role of facilitating the process of governance and is a source of constraint when disagreements occur. Complexity in today's internationalised society is growing in all directions and is increasingly multi-levelled and multidimensional. This requires practical steering and complex governance based on large knowledge about the nature of interactions (Kooiman 2000). Central concepts of analysis and governing are to aim at solving problems and seek to create opportunities. The problem solving processes need to identify interests and aspects of relations as well as locating sources of tensions. Calculating the behaviour of actors, both their rational and norm driven behaviour, play an important role.

2.2 Discourse analysis

The perspective of governance is closely correlated to the concept of discourses, as an important part of the system. Discourses are described by Arts et al (2010) as *"(dominant) ideas, concepts and categorisations in a society that give meaning to reality and that shape the identities, interests and preferences of individuals and groups"*. If the perspective of governance provides an organisational framework of reality, discourse analysis describes the processes involved. According to Arts and Buizer (2008) can discourse for example be approached as *text* or as *frame*. The perspective of *discourse as text* suggests that texts,

language and conversation are the basic units of analysis. Words and meanings of expressions made by particular actors are then of interest as well as conflicts that may be a result of language usage. *Discourse as frame* is a more abstract perspective and draws from the interpretation of discourse as being more than just linguistics and being even the shared meaning of reality. It suggests that conflicts can be solved by bringing up and discussing conflicting frames. Reframing of the dominant discourse is then a process of change and a possibility of joint solutions.

Discourse analysis as a research approach is used to provide a deeper insight about interests and relations of actors without explaining motives and causes (Beckman 2007, p 87-95). Discourse analysis suggests that new knowledge about a phenomenon, such as an actor's position, is retrieved by creating a structural overview of the actor's thoughts, political messages and perception of reality. Things said and thought are actions in themselves and positions, which are built up by statements, are therefore important study objects. By structuring statements, the position of an actor can be defined and new knowledge about the reality can be obtained.

2.3 Actors

With the perspective of governance the private actors play an increasingly important role in the contemporary society and also within the forest sector in Sweden. Both private and public actors engage themselves and together form the general discourse, but many private actors are benefitting from new policy arrangements and diffusion of political power even at the cost of public actors in some cases (Arts et al 2006). An actor perspective is beneficial when analysing forest policy and the understanding of private actors and their context are even crucial to the analysis. The changing societal interdependencies between actors as well as their interactions determine each other and actors are in fact according to Kooimann (2000) continuously formed by their interactions and cannot be separated from them. Interactions can be either controlling or space creating; giving actors varying degree of freedom and flexibility. Large action space renders the actors large freedom to select their own values, goals and interests to strive for.

The actors own set of goals, needs, objectives as well as certain frames of reference or political ideology guides their judgments about reality (Meltsner 1972). Actors' beliefs and motivations are best discussed with a reference point such as a political context in order to analyse the positions of relevant political forces. This reference point can also be seen as a bureaucratic site with central significance for the analysis. In order to analyse policies such sites have to be identified based on where the actors are present.

Forests are often argued to hold a high complexity and large diversity of conflicting interests (Krott 2005, p 8-16). Krott defines interests in the forest as being *"based in action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"*. Interests are specific to each stakeholder or actor and are useful in explaining their individual causes of action. In a world of limited resources individual interests are bound to result in conflicts. Conflict resolution can according to Krott be realised by policy making defined as *"a social bargaining process for regulating conflicts of interest. Forest policy is that social bargaining process which regulates conflicts of interest in utilizing and protecting forests according to the programs of the forest sector"*. Information and power are the two different elements of social bargaining. Conflict resolution can be to provide information and raise public awareness but also to find practical solutions combining different interests and goals. Negotiations become necessary when

different interests cannot be realized at the same time and a regulation is sought for - leading to exercising power in different forms. For elaborating forest policy processes it is therefore crucial to make close observation of the diverse interests in the forest.

Interests are however not all openly displayed by the actors and it might harm the possibility to achieve certain goals if their true interest should be revealed (Krott 2005, p 8). This is an obstacle for policy analysis when actors might hold back on taking positions in order to gain advantages in the bargain process (Meltsner 1972). Stakeholders or actors with certain interests present a forest policy program for which they will seek general acceptance (Krott 2005, p 31-36). To find acceptance they might for example use value-judgements based on so called partial facts meaning that only facts supporting their own position is brought forth. Other means of finding acceptance of a forest policy program is for example empty formulas when difficult issues are described by such formulations that none can find them disapproving. Actors with economic, environmental and social interests in the forest can all see their own interests put into force by such a formulation as "sustainable forest management" for example.

2.4 Research questions

It is possible to identify four research questions to be answered in order to reach the aim of the study:

- What conflicting positions between the actors can be identified?
- Which are the dominating discourses, from key actors' point of view, within the issue "Bioenergy from the forest"?
- Have the dominating discourses changed between years 2000-2010? And in that case - in what sense?

3 Material & methodology

3.1 Study approach

The governance perspective serves as a guide for the analysis of actors' positions and the approach is to use discourse theory and do descriptive text analysis. Descriptive analysis includes drawing conclusions and contributing with insights about the topic without judgment or further interpretation of causes and motives (Beckman 2007, p 48-54). A political message or a position can be obtained by text analysis, and by systematically arranging the data new knowledge can be obtained that was impossible to deduce from the material itself. The meaning of a stand point can be clarified if compared with other actors. Similarities and differences will enrich the description and provide additional observations and information about reality.

The research questions focuses on the position of actors as the unit to be analysed. The properties of any analytical unit are described by identified variables (Teorell & Svensson 2006). The variables in this study are the statements made by the actors. The structuring of statements into categories is done by using a classification schedule (see Appendix I). This is also a method of structuring the empirical material in accordance with the theory of discourse analysis (see Section 2.2). The categories are expressions for present discourses in which the actors engage themselves and the classification schedule is based on empirical inductive methodology. The categories were formulated with a starting point in the framework provided by Viveca Sjöstedt (2011) and thereafter modified to fit the scope of the study. The modification included adding and removing categories as well as reformulations resulting in a final version visible in Appendix I.

In order to give a clear structure of the analysis, different levels were identified inspired by Teorell & Svensson (2006), see Figure 1. The general terminology presented in the theoretical part is in the figure translated from general definitions into study specific terms. "Renewable energy" is identified as the broad problem area referred to earlier in this paper as the *policy issue area*. "Bioenergy from the forest" is seen as a *political category* and clarifies the political context in which the analysis of the empirical data should be made. The next level further limiting the scope of this study is the selection of actors. The analytical unit is the position of selected actors. Actors' positions are as earlier pointed out consisting of statements which in their turn are built up by quotes. Statements are observed in text documents and categorised.

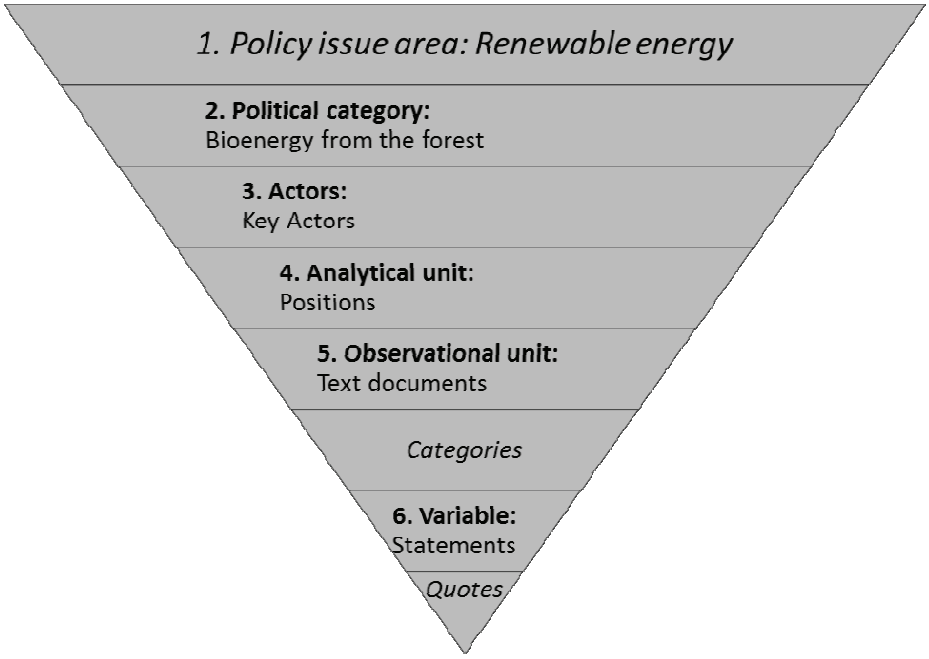

Figure 1. Illustration of the different levels used for structuring the practical research, inspired by Teorell & Svensson (2006).

3.2 Selection of key actors

The different interests in the forest resource are represented by different actors. The specific interests highlighted in this study are ownership, industrial and environmental interests. Representatives of these three different interest groups were identified and selected as key actors, corresponding to the third level illustrated in Figure 1. The criterion for selection was that the actor should be active on national level, being visible within the issue "bioenergy from the forest" and hold the position of referral body. The interests of ownership and private forest owners are here represented by the Federation of Swedish Family Forest Owners (LRFS). Industrial interests are represented by The Swedish Forest Industries Federation (SFIF) which is a national organisation representing a wide range of industries all connected to the forest resource. The environmental and nature conservation interests are in this study represented by the Swedish Society for Nature Conservation (SSNC). These three actors were all visibly active within the issue and were found to hold the position of referral bodies.

3.3 Data selection

From the research questions the positions of the actors were identified as the analytical unit and illustrated as the fourth level in Figure 1. The positions of the actors were to be found in already existing text documents that had certain properties. The text documents had to be comparable between the actors and produced by them all continuously over time. They also had to contain thought through formulations by the actors themselves and represent their official positions. These criterions resulted in selecting the actor's answers to the government's proposals referred for consideration as the observational unit corresponding to the fifth research level in Figure 1.

The actors answers to governmental proposals can be acknowledged as a bureaucratic site with central significance for the analysis and as the reference point referred to by Meltsner (1972). The activity and interactions are here the dialogue between actors and the state, represented by different governmental bodies. The fact that the actors are responding to

governmental proposals means that the nature of interaction gives little less freedom and flexibility for the actors to state their positions. This is an important aspect to be considered when describing the actors' positions.

To obtain the text documents the initial search effort was directed towards the homepages of the three actors. The answers to governmental proposals were divided into different topics on the actors' homepages. All documents from relevant topics such as energy, forest, climate and environment were downloaded from the homepages. This resulted in a large number of documents that were then searched through with key words according to the schedule in Table 1. Documents not containing any of the keywords were discarded and documents containing the keywords were included in the first data selection.

Table 1. Key words for selection of relevant material

Language	Key word 1	Key word 2	Key word 3	Key word 4	Key word 5
Swedish	Skog	Bioenergi	Energi	Bränsle	Stubb/GROT
English	Forest	Bioenergy	Energy	Fuel	Stumps/GROT

After the initial search on the homepages the key actors were contacted directly and asked to send all their answers to governmental proposals concerning energy and forest from year 2000 and onwards. This request resulted in a large number of both new and previously found documents. Once again the documents were searched through with keywords according to the schedule in Table 1. The documents missing any of the keywords were discarded and documents containing the keywords were included in the first selection.

The documents included in this first selection were then searched through once more to see if the actors had made any statements about energy from the forest or not. If they contained at least one statement concerning bioenergy from the forest they were included in the second selection.

The second selection of documents was compiled according to which governmental proposal they answered. To some governmental proposals all the actors had given an answer, to other proposals only two out of three actors had given an answer and in many cases only one actor had answered to a specific governmental proposal. The conclusion was drawn that some governmental proposals were more focused on the specific issue of bioenergy from the forest and therefore more important for the study.

A second round of requests was executed to make sure that all the actors' answers to important governmental proposals were included in the data selection. The actors were this time sent a request about specific answers that were missing in comparison with the other two actors' contribution to the study. The second round of requests resulted in yet some new documents that were put through the same selection procedure as before with keywords and statements about bioenergy from the forest.

The second round of requests was followed by a final request if the key actors considered that they had provided enough important documents for giving an accurate picture of their positions regarding the issue "bioenergy from the forest". The answers were affirmative and it was therefore considered that the study had a complete census material of relevant answers to governmental proposals from the three actors within the time period of year 2000-2010.

The data selection procedure resulted in a number of text documents that in some cases contained the answers to two different governmental proposals and the opposite; two documents could be the complete answer to one governmental proposal. The cataloguing of the documents was therefore done by organising the text documents into observational units, expressed in Figure 1 as the fifth level. One observational unit is equal to one single text document; a PDF-file, a Word-document or a paper copy.

3.4 Data analysis

The data selection was followed by identifying quotes and statements in the text documents. The identification was performed in PDF files and each quote about bioenergy from the forest was marked with a colour making it possible and easy to return to the source. One or several quotes in a text document verify a statement. Each statement identified was given an identification number and was linked to a verifying quote with a comment function as illustrated in Figure 2.

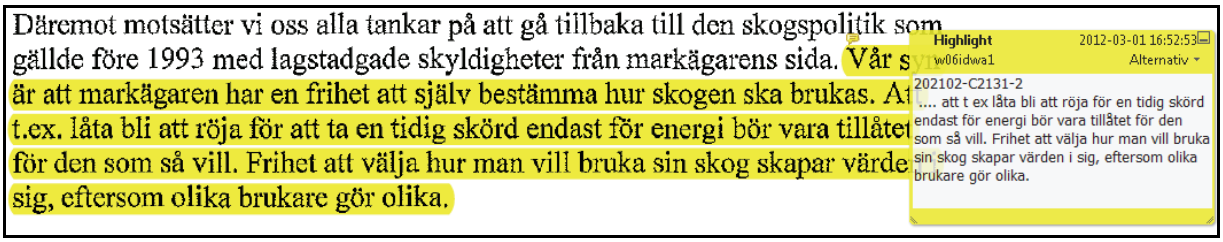

Figure 2. Illustration of the practical identification of quotes and statements made in PDF-files.

One text document could contain many statements which one by one were categorised according to the classification schedule in Appendix I. Within each category the positions of the actors were represented by three alternatives denoted; “pro”, “against” or “indifferent”. For each category these denotations were phrased a bit differently and are all to be found in Appendix I. The example of a statement and a verifying quote illustrated in Figure 2 was categorised as “Bioenergy from the forest and Regulations and restrictions”. In this case LRFS states a position “against” restrictions and regulations. Each statement was given a unique identification number.

The numbered statements were compiled into an excel document for further analysis. Tables and diagrams describing and structuring the data material were created in Excel. Using the research questions as guidance the data was organised so as to describe and illustrate the positions of the actors in the best possible way.

4 Results

4.1 Included governmental proposals referred for consideration

The governmental proposals referred for consideration that had been answered by the actors contained a wide range of subjects and policy areas. Statements about bioenergy from the forest were mainly found in proposals concerning energy, climate and forest, but also about agriculture for example. The governmental proposals included in the data selection and that had been answered by at least two of the actors were considered more important to the study and they are all listed in Appendix II. A closer look at these 14 governmental proposals reveals that the majority were authored by the Ministry of Enterprise, Energy & Consumption and several were written by The Swedish Forest Agency. Other author sources were the Ministry of Environment, the Ministry of Rural Affairs and the Climate Committee. Few of the governmental proposals were directly focusing on bioenergy from the forest.

4.2 Actor's statements

The key actors were found to have produced in total 49 answers to governmental proposals during the years 2000-2010 and containing statements about bioenergy from the forest, see Table 2. These 49 answers corresponded to 51 text documents, so called observational units. In these text documents in total 203 statements were identified and categorised into total 16 different categories.

Table 2. Summary of data material used as the base for analysis

Actor	No of answers to governmental proposals	No of observational units	No of statements (variables)	No of categories
SFIF	21	21	80	14
LRFS	16	17	63	12
SSNC	12	13	60	11
Total	**49**	**51**	**203**	**16**

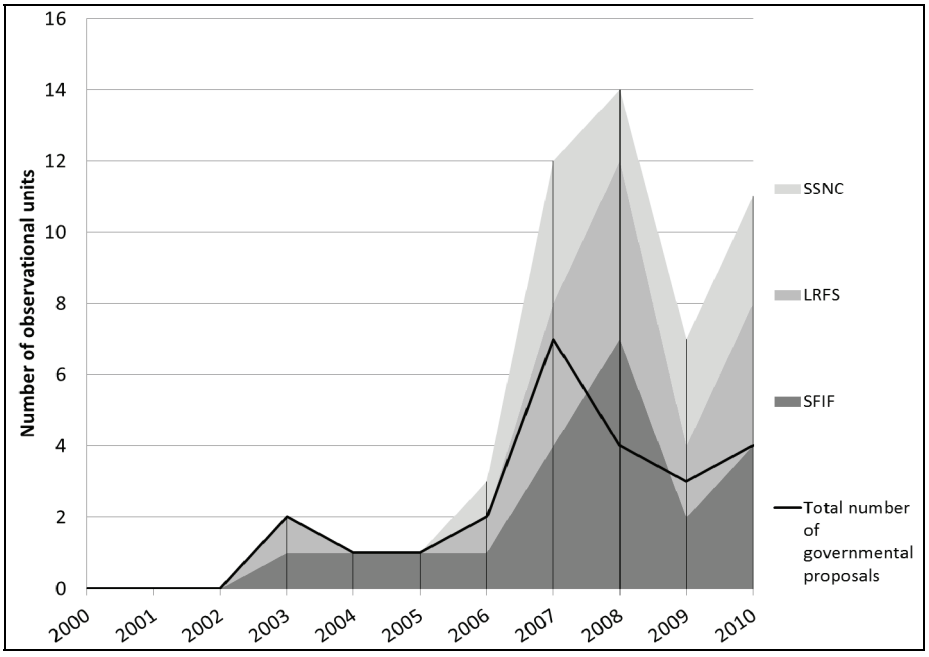

Figure 3. Number of observational units from each actor adding up to the total sum of observational units per year. The black line showing the total number of governmental proposals for each year included in the data material of the study.

There were no observations of text documents, containing statements about bioenergy from the forest, made in the beginning of the study period, see Figure 3. There was also a delay from the publication of the governmental proposal to the publication of the actor's answer. The first observation of a text document containing a statement about bioenergy from the forest was made year 2003. In year 2007 and 2008 there was a peak in the number of observational units. The increase was then followed by a decrease during year 2009 and 2010, but on the whole it was an increase of both governmental proposals, answers and statements referring to bioenergy from the forest during the time period of the study.

The statements made by the actors were categorised according to the classification schedule in Appendix I and the percentage of statements made by each actors in each category is displayed in Figure 4. Over all there were a few categories that proved more prominent and that contained many statements from the key actors namely; "Bioenergy from the forest as a Business opportunity", "- and the Environment", "- and Restrictions & regulations" and "- and the Climate change", see Figure 4. Differences between the actors can be observed and for example LRFS had no statements in the two categorise "Bioenergy from the forest and Employment" and "-Biodiversity". SSNC on the other hand had no statements about "Bioenergy from the forest and Employment", "- Rural development" and "- as an Assortment". In comparison with LRFS and SFIF; SSNC made many statements in the category "Bioenergy from the forest and the Environment" and "- and Biodiversity", while SSNC made almost no statements at all in the category "Bioenergy from the forest as a Business opportunity".

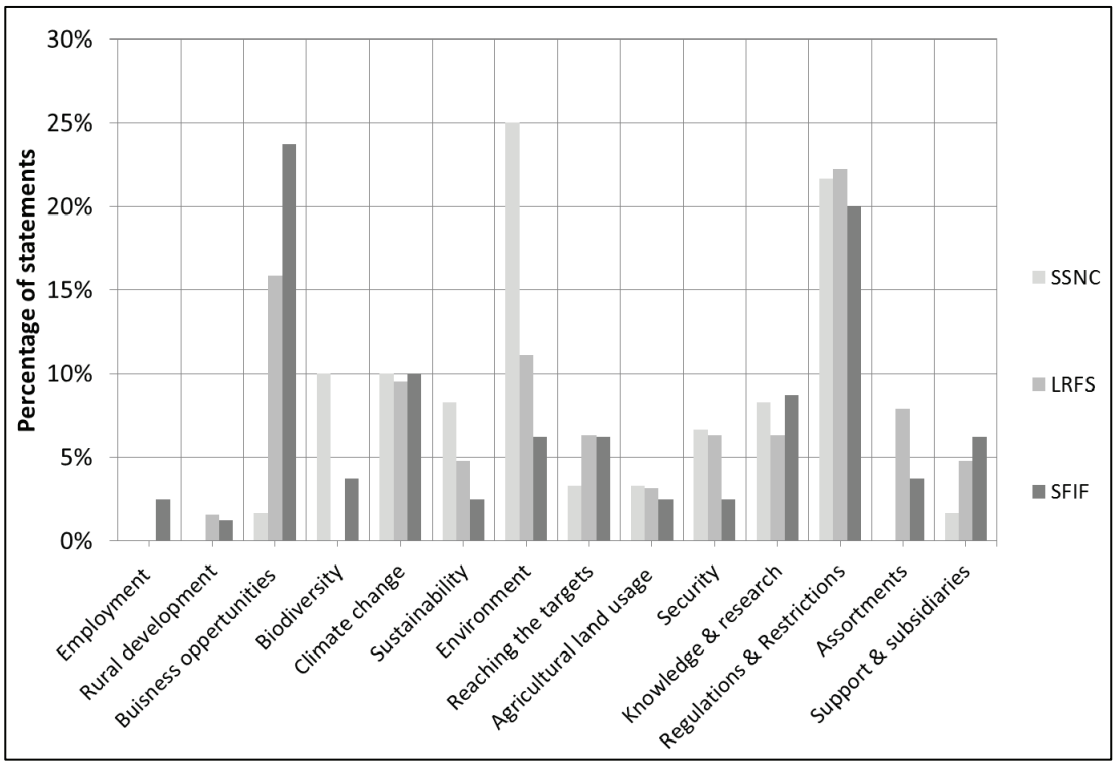

Figure 4. Displaying the percentage of statements made by the actors in each category.

The four most prominent categories mentioned earlier contained 55% of all the statements made by the actors during the time period year 2000-2010. The top five categories of all the actors together and for all the actors respectively are displayed in Table 3. The top five categories varied between the actors and the list of SSNC differed more from the other two

actors. Even so it was possible to observe that there were a few dominating categories, containing a high percentage of statements made by the actors.

Table 3. The top five categories all actors together and for each actor respectively. The percentage of the total number of statements for each category is displayed

	SSNC	%	LRFS	%	SFIF	%	All actors	%
1	**Environment**	23	Restrictions & regulations	20	Business opportunities	22	Restrictions & regulations	20
2	**Restrictions & regulations**	21	Business opportunities	15	Restrictions & regulations	20	Business opportunities	14
3	**Biodiversity**	10	Environment	9	Climate change	11	Environment	11
4	**Climate change**	8	Climate change	9	Knowledge & research	9	Climate change	10
5	**Sustainability**	8	Assortments	8	Reaching targets	6	Knowledge & research	8
TOT		**70**		**61**		**68**		**63**

The same pattern was visible when the number of statements divided into categories was displayed over time. The same categories of statements dominated but showed some fluctuation over the years, see Figure 5. The proportion of the dominant categories did not change substantially over the years; together they continued to constitute approximately half of the statements made by the actors. However the category about "Bioenergy from the forest and Climate change" was most prominent in the year 2008 and then decreased as well as the total number of statements. The category about "Bioenergy from the forest and Restrictions and regulations" increased in proportion from year 2007 and continued to have a high proportion until the end of the time period. Other increases and decreases of the proportion of categories were following the general trend in the total number of statements made.

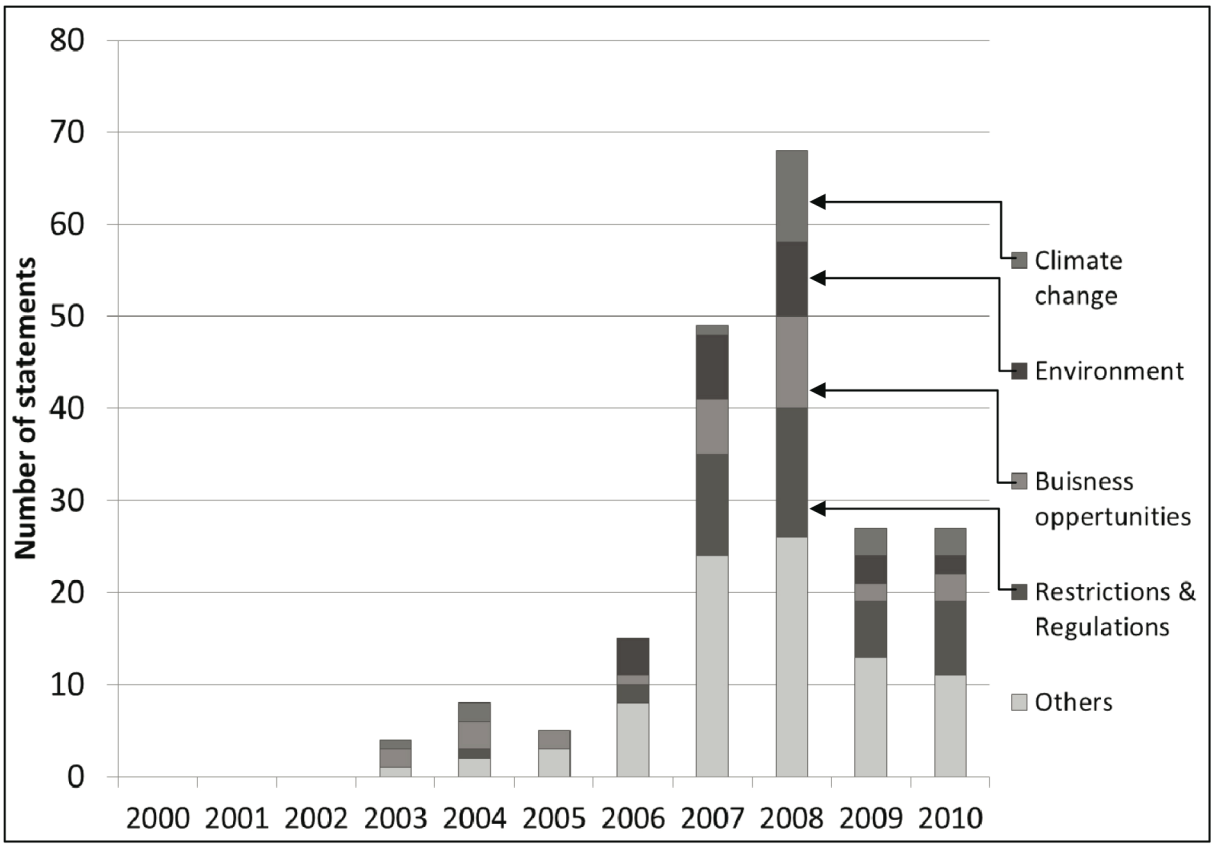

Figure 5. Number of statements for all actors together displayed year by year and divided into categories. Four categories of statements are more prominent; "Bioenergy from the forest as a Business opportunity", "- and the Environment", "- and Restrictions & regulations" and "- and Climate change".

The statements structured into categories are expressions of present discourses in which the actors engaged themselves. The categories are collections of statements about the same subject and according to theory a discourse is "a collection of linguistic expressions and perceptions about a subject". The dominating discourses engaging the key actors to a higher degree were "Bioenergy from the forest and the Environment","- as a Business opportunity", "- and Restrictions & regulations" and "- and the Climate change". These dominating discourses did not change substantially between the years 2000-2010. The discourse about "Climate change" became more prominent in year 2008.

4.3 Actor's positions and dominating discourses

In this section the results will be presented divided into dominating discourses and the positions of the actors will be illustrated by charts. Quotes made by the actors and taken from the empirical data will be presented supporting the findings of the study.

4.3.1 Business opportunities

LRFS and SFIF were both very active within the discourse "Bioenergy from the forest as a Business opportunity", see Figure 6. They both primarily stated a positive view upon bioenergy from the forest as a business opportunity and in second hand that bioenergy from the forest is negative for business and in third hand as being indifferent. SSNC were not very active within the discourse.

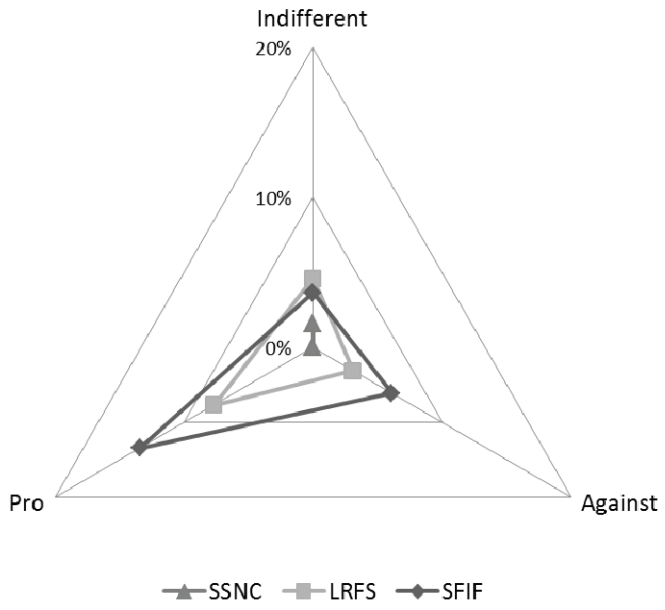

Figure 6. Actors' positions within the discourse "Bioenergy from the forest as a Business Opportunity". On the axis the percentage of the total number of statements is displayed. Each actor is represented by a line with different shapes in the corners; LRFS is denoted with a quadrat, SFIF a diamond and SSNC a triangular.

In year 2004 SFIF expressed concerns that in a scenario where both nuclear energy and other fuels should be partly replaced with biofuels then there would be a deficit of raw material. Later in year 2007-2008 SFIF were positive to bioenergy from the forest and regard it as a business opportunity.

Sweden can then increase its energy production from biofuels without affecting the raw-material situation of the industry.
SFIF March 2008

However in year 2010, SFIF still expressed concerns that there would not be enough raw materials for the industries or it would become too expansive. They stated that such a development would result in a closure of industries and loss of international competiveness. SFIF therefore argued that it is important to increase both extraction and production of biomass. This should be done by intensive forest management and other silvicultural measurements.

It is of outmost importance that Sweden allows and invests in growth-enhancing measures within forestry, as this will lead to more raw materials both for the industry as for the energy-production.
SFIF March 2008

To a large extent LRFS took the same position as SFIF within this discourse. They were positive towards bioenergy from the forest but stated that the potential of increased energy production should be realized in symbiosis with the production of sawn-goods and pulp/paper. They further argued that it is important to produce quantities of forest fuels substantially exceeding the domestic needs. LRFS also saw an increased profitability for the forest company and for society as a result of increased forest production.

4.3.2 Environment and Biodiversity

In general SSNC had a positive view upon bioenergy from the forest. However they expressed several demands that the increased biomass production should not negatively affect nature, environmental or social values. They argued that the environmental goals must not be compromised. SSNC was very active in the two discourses "Bioenergy from the forest and the Environment" and "- Biodiversity" see Figure 7 and 8.

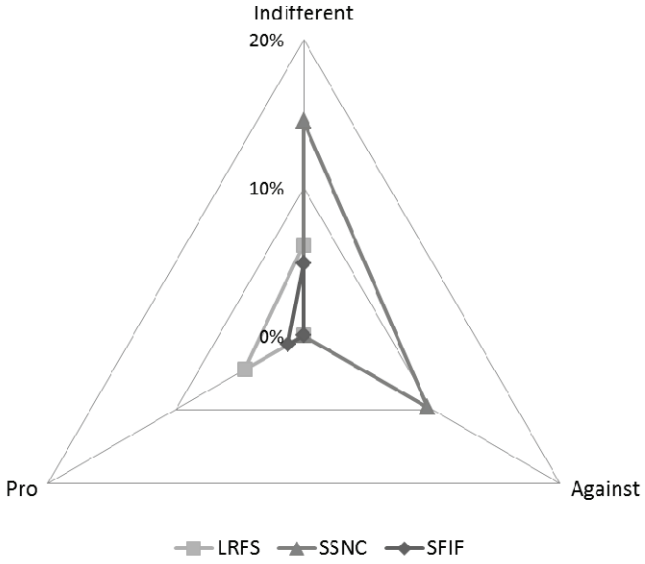

Figure 7. Actors' positions within the discourse "Bioenergy from the forest and the Environment". On the axis is the percentage of the total number of statements displayed. E Each actor is represented by a line with different shapes in the corners; LRFS is denoted with a quadrat, SFIF a diamond and SSNC a triangular.

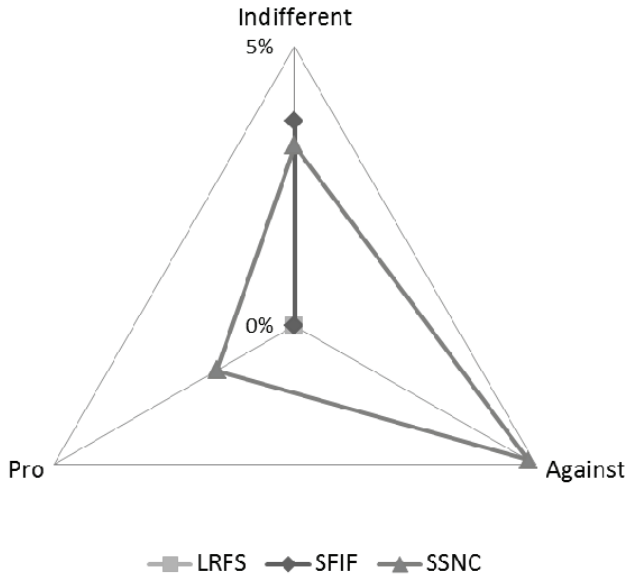

Figure 8. Actors' positions within the discourse "Bioenergy from the forest and Biodiversity". On the axis is the percentage of the total number of statements displayed. Each actor is represented by a line with different shapes in the corners; LRFS is denoted with a quadrat, SFIF a diamond and SSNC a triangular.

SFIF and LRFS were less active within the two discourses and also took different positions than SSNC. SFIF and LRFS positioned themselves stating that bioenergy from the forest was either positive or indifferent for the environment and the biodiversity. SSNC were instead

stating that increased production of biomass for energy in the form of stump harvest and intensive forest management would have possible negative consequences for biodiversity, environment, ecosystems and recreational possibilities

The position taken by SSNC is in direct conflict with the position stated by LRFS; the wood production in Sweden can increase substantially without compromising other values in the forest and that an increase is necessary in order to meet the requirements of a sustainable society in the future. LRFS also saw a conflict between the need for more forest biomass and protection of forest land for nature conservation.

One example of conflict is the need for raw material from the forest for bioenergy and as a substitute for renewable material to combat climate change and the additional set a side forest areas for nature conservation purposes.
LRFS July 2008

SFIF were also of opinion that there is a conflict:

Additional set aside areas would result in lack of mature harvestable forest and the consequences would be closure of saw-mills and pulp-factories. The supply of biofuels from the forestry would also decrease.
SFIF July 2008

4.3.3 Climate change

Within the discourse about how to combat climate change (see Figure 9) SFIF emphasized the importance of forest utilization and the effects of substituting fossil fuels as well as other non-renewable materials by materials from the forest. This would according to them lead to sequestration of carbon in wood products.

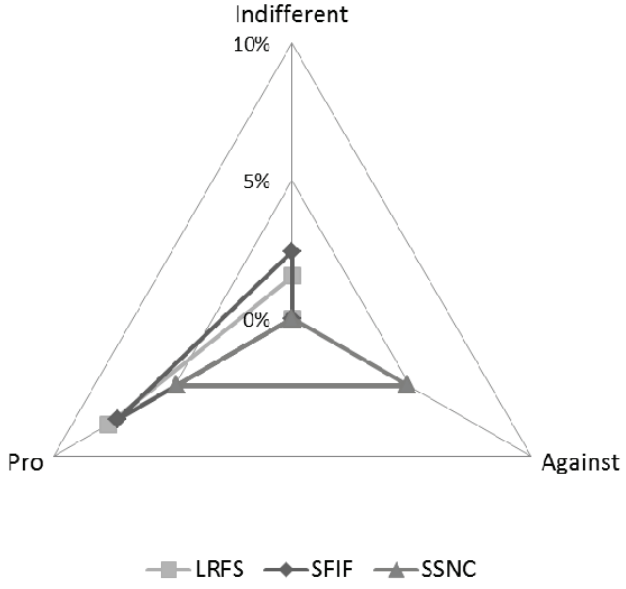

Figure 9. Actors' positions within the discourse "Bioenergy from the forest and Climate change". On the axis is the percentage of the total number of statements displayed. Each actor is represented by a line with different shapes in the corners; LRFS is denoted with a quadrat, SFIF a diamond and SSNC a triangular.

The key actors often made a connection between what is good for the environment and how to combat climate change. It was for example stated by SFIF that combating climate change by using bioenergy from the forest was positive for the environment.

There was also according to SSNC good possibilities to increase the forest's contribution to the total energy supply and to utilize the forest to a greater extent as a carbon sink.

More biofuel than today should be recovered from the forest in order to manage the future climatic and energy challenges.
SSNC January 2010

4.3.4 Regulations & restrictions

Within the discourse about Regulations and restrictions all the actors were very active and clearly divided, see Figure 10. SFIF and LRFS were mainly positioning themselves "against" regulations and restrictions, SSNC took the opposite position as being "pro" regulations and restrictions.

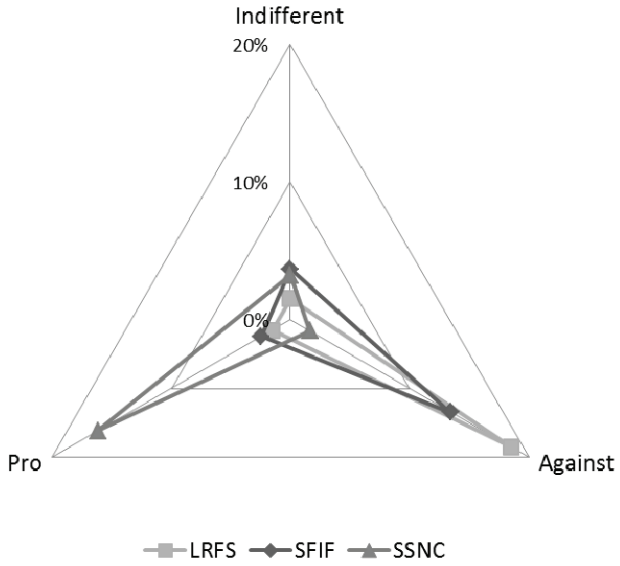

Figure 10. Actors' positions within the discourse "Bioenergy from the forest and Regulations and restrictions". On the axis is the percentage of the total number of statements displayed. Each actor is represented by a line with different shapes in the corners; LRFS is denoted with a quadrat, SFIF a diamond and SSNC a triangular.

In general SFIF and LRFS clearly stated a position against regulations and restrictions and especially towards the EU directive about sustainability criteria of renewable energy fuels. There should according to them be no special legislation, additional reporting, and demands upon verification or any new government institution in order to prove and fulfil any standards of sustainability of the biomass. Today's legislation, criterions and reporting systems are enough to ensure society that the biomass is sustainable according to SFIF and LRFS. The biomass production should not be regulated by goals developed for other environmental qualification systems or within other sectors.

… therefore consider that within the forest sector there are no needs for specific law regulations, additional report demands, verification requirements or any new supervising authority in order to fulfill the demands of the directive.
SFIF December 2009

LRFS also pointed out the economic situation of smaller businesses and that the costs for additional documentation could become an obstacle.

Institutional obstacles in the fore of unmotivated taxes, fees, regulations, bureaucracy etcetera that prevent the transition to oil-independency are not acceptable.
LRFS November 2010

There was however clear signs of ambivalence when it came to market regulations. On one hand it should be economical market forces steering the supply of bioenergy and no support systems or restrictions should interfere.

… it is and it should be economic factors steering the supply of forest fuels.
SFIF October 2006

… forms of support connected to a sustainability law can easily result in distortionary consequences for forestry and forest industry.
LRFS December 2009

But on the other hand they asked for measures to be taken so that no industrial raw material will be burnt as energy instead of being processed into pulp and paper.

It is important that the instruments are carefully balanced to that the biofuel investment does not lead to a situation where industrial wood is burnt instead of being processed into pulp and paper.
SFIF October 2005

SSNC were as seen in Figure 10 of the opposite opinion and expressed great concern about the risks with increased production of bioenergy from the forest. The regulations and restrictions of today should according to them be overlooked and developed to ensure that biological diversity, recreation and other nature values are not negatively affected any more than necessary. SSNC stated that it should be possible to enforce sanctions in the case that the law is violated.

… an increased extraction should be totally possible provided that there is an enhanced consideration … The fundamental requirement is of course that the law regulated minimum standard is maintained, something that is not the case today. Possibilities of sanctions should be introduced concerning this point.
SSNC January 2008

4.3.5 Reaching the targets and Knowledge & research

The two discourses mainly uniting the actors were “Bioenergy from the forest and Reaching the targets” and “-the need for Knowledge and research”, see Figure 11 and 12. All actors agreed to a high degree that bioenergy from the forest would be helpful in achieving the targets set by the state, the EU and the UN. They all stated that there was a need for more knowledge or research.

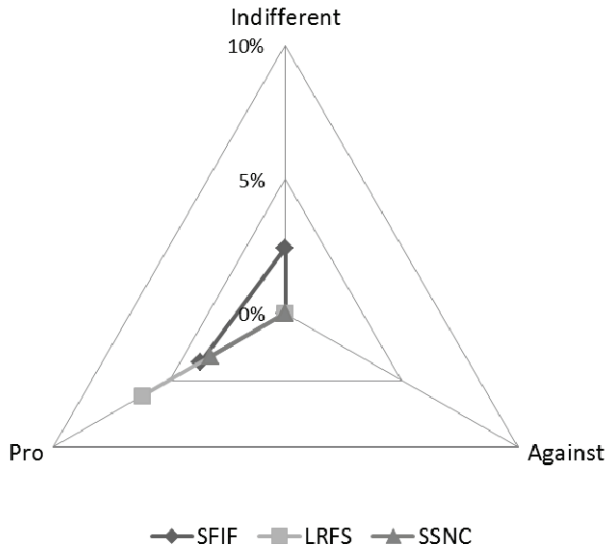

Figure 11. Actors' positions within the discourse "Bioenergy from the forest as a way of reaching the targets". On the axis the percentage of the total number of statements is displayed. Each actor is represented by a line with different shapes in the corners; LRFS is denoted with a quadrat, SFIF a diamond and SSNC a triangular.

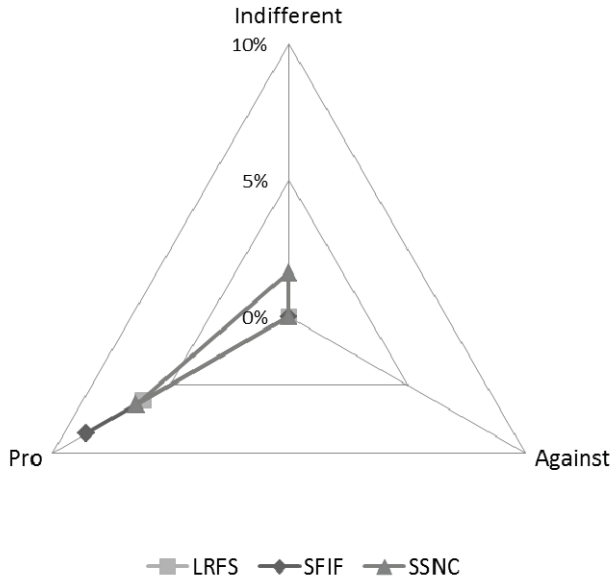

Figure 12. Actors' positions within the discourse "Bioenergy from the forest and the need for Knowledge and research". On the axis the percentage of the total number of statements is displayed. Each actor is represented by a line with different shapes in the corners; LRFS is denoted with a quadrat, SFIF a diamond and SSNC a triangular.

There was however a small difference concerning what type of knowledge and research the actors asked for. SFIF asked for more research about environmental effects and about the development of efficient technologies for biomass extraction. LRFS stated that research and development efforts is needed both for developing technological solutions and to increase knowledge about practical environmental consequences of bioenergy from the forest. According to SSNC knowledge about the environmental consequences both on short and long-term was generally missing and especially knowledge about stump harvesting.

5 Discussion & conclusions

The aim of this study was to provide new information about actors' positions within the issue of bioenergy from the forest. In conclusion the key actors agree on the following:

- It is possible to increase the extraction of bioenergy from the Swedish forests.
- It is important with bioenergy from the forest both for the security of energy supply and for combating climate change.
- There is a need for more knowledge concerning the environmental effects of bioenergy extraction.
- Bioenergy from the forest will be helpful in reaching the targets of policies.

They disagree on the following:

- Present and future policy instruments and regulations.
- The environmental effects of stump harvest and other forest management practices for increased production of biomass and bioenergy.

The results of the study describes a consensus among the key actors that the forest has to contribute more to the energy balance in Sweden but opposing positions are visible when it comes to the more technical aspects of the implementation. These results are in line with the findings of Ottosson (2011) and Lindkvist et al (2011). The forest industries regard bioenergy from the forest as a business opportunity and both the industries and major forest owners are positive to intensive forest management for the same reason. The resistance towards regulations and restrictions from the same actors is reflecting classical forest ownership interests – to maintain one's own power over the forest asset (Krott 2005). The position of SSNC is also in line with earlier research concerning nature conservation interests (Lindkvist et al 2011). Their number one priority is protection of the environment and biodiversity as well as increased control by society over the forest resource.

The position of LRFS shown in this study is very similar to the position of the forest industries. Instead of three positions the analysis is mainly analysing two positions. The distinction between two opposing positions were also made between "forestry" and "the environmental movement" in the study made by Lindkvist et al (2011), but there was also a distinction made concerning major forest owners. LRFS are primarily representing family forest owners, not necessarily any major forest owners. The competition over the forest resource increases the value of any forest holdings and should be welcomed by all forest owners with an economical interest (Brännlund et al 2010). This interest seems to be lesser prioritised than the maintenance of the power over the forest asset. It is important to point out is that LRFS are representing somewhat different interests as two out of four forest owner associations have industries themselves. The forest owner association Södra for example holds large pulp and paper industries. The business opportunity aspect to bioenergy from the forest is also very prominent as Södra is also very active on the energy market being a large producer of solid biofuels (Södra 2012). SFIF are also representing a large diversity of industries, both the saw-mills, pulp industries as well as forest owning companies and companies active on the energy market. Therefore both LRFS and SFIF positions are in fact the result of a great diversity of interests.

The results do not show any new conflicts between the actors' positions in the end of the study period. The dominating discourses have one the other hand shifted to a small extent during the

time period and behind this reality are different factors and events. The governmental investigation in 2006 opened up for intensive forest management in Sweden (Enander 2007, p. 287-298). This has affected the general discourse which is clearly visible in the results of this study. In year 2008 the actors answered the governmental proposal called MINT- Possibilities of Intensive Forest Management in Sweden, which resulted in a large number of statements mainly concerning bioenergy from the forest as a business opportunity and concerning the environmental effects. The number of statements about Climate change increased in year 2008 as a direct consequence of the Climate Investigation made by the Swedish government in 2008.

This direct correlation between the governmental proposals referred for consideration and the number of statements by the actors within different discourses could be seen as a weakness to the study. The analysis of the actors is to a certain degree steered by the governmental agenda as the actors are answering directly on the governmental proposals. Within other arenas such as the media the actors are given more freedom and flexibility to formulate their priorities and agendas. The answers to governmental proposals however provides a clear reference point for the analysis and according to the theory of governance the state still holds an important position as to setting the general agenda. In the actors' answers to governmental proposals they are trying to find acceptance for their respective policy programs and they take the opportunity to formulate and advocate their positions as much as possible. As pointed out in Section 4.1 there are few governmental proposals directly focusing on bioenergy from the forest. The issue is rather treated as a part of the solution to larger political issues, but even so the actors make sure to state their position about bioenergy from the forest. Therefore the method of identifying dominating discourses is not only reflecting the governmental agenda but also the priorities of the key actors.

The rapid increase in number of statements made by the actors in 2007 are however directly correlated to the number of governmental proposals referred for consideration. The development and general increase of data around year 2007 is visible both in Figure 3 and 5 as well as in Appendix II. This development is a direct reaction not only to the national governmental agenda but also a reaction to the international agenda. In year 2007 the Intergovernmental Panel on Climate Change (IPCC) published their report and the climate change discourse became more prominent also on national level (Government offices of Sweden 2012c). The Swedish Climate Committee published their final report in 2008 which is directly related to the results of this study; there is a slight increase in the number of statements about climate change in year 2008. The correlation between study results and the international political agenda can also be seen for renewable energy within the European Union and the Sustainability criterions for biofuels. This is the normal cause of action; international policies trickle down and finally reach the actors on national level which will react to the policies for example by answering governmental proposals. Actors are always acting in a political context and are as pointed out already in Section 2 in fact continuously formed by their interactions and cannot be separated from them – it is a clear point of reference for the study. The implications for the analysis are the same as for the actors themselves; the development of positions is closely correlated to the general discourse. The governance perspective for analysing and understanding the actors' positions is valuable as it includes the context in which the actors are active and highlights the dominating discourses and conflicts.

The actors are using different strategies to find acceptance for their policy programs, but the classical empty formula - "sustainability" - is not used by the actors to any great extent. There

were just a few statements categorized as “Bioenergy from the forest and Sustainability” compared to the number of statements categorized as “Bioenergy from the forest and the Environment”. The key actors are often stating that bioenergy somehow has either positive or negative effects on the “environment”. Exactly what is meant with positive or negative effects and what part of the environment is not always made clear. Due to this general way of using “environment”, the term can here be seen as an empty formula.

Other ways of seeking acceptance for a policy program were for example by practicing partial facts. There were discourses in which the actors were less present. The discourse about “Biodiversity” is mostly engaging the environmental organization SSNC and not the forest owner association at all. This could be a case of partial facts strategy by SFIF and LRFS as they seem to prefer to relate to “the environment”. That SSNC is not participating in the discourse about bioenergy from the forest as a business opportunity.

A connection is often made between what is good for the environment and what is done for combating climate change. The actual correlation between the environmental effects of climate change is not made clear by science and it is therefore quit easy to argue in one way or the other. The result is a more complex discourse but the actors are all agreeing to need for more knowledge and research. As stated by Nilsson et al (2004) it is easy to agree politically on the importance of RD&D, but more difficult to agree on measures that will affect actors and markets directly, which is very visible within the discourse about regulations and restrictions.

The rapid increase of statements from the first half of the decade indicates as mentioned above an increased interest for the issue both from the society and from the actors. The main weakness of the study is otherwise the limited data material. Spread out over a time period of ten years there is not a large amount of proposals or statements to draw conclusions from. Other complementary sources of data would have been needed and especially more data material originating from the first half of the time period would possibly result in a better comparison of actors’ positions over time.

The conclusion regarding the actors’ positions within the issue bioenergy from the forest is that opposing positions are a result of different values and interests which continue to be visible within the different discourses. Decision makers should take notice of the fact that the actors agree upon that bioenergy from the forest is positive for reaching the targets set up by society, but within the very complex issue the practical solutions and synergies are not easily found as the results of this study show. The Swedish forestry model gives “freedom under responsibility” to the actors but even so the governance process needs national government and settled institutions in order to be efficient (Hirst 2000). National government plays the role of facilitating the process of governance and is a source of constraint when disagreements occur. If the government proves incapable of prioritising between goals there seems to be small possibilities for the actors themselves to agree upon practical solutions concerning bioenergy from the forest. Negotiations are the alternative if different interests cannot be realized at the same time and the result is then exercising of power by the actors (Krott 2005). Future studies of actors’ positions concerning bioenergy from the forest would benefit from investigating the actors’ actual means of power and their possibilities to practically impose their view of forest management out in the forest. More technical oriented research approaches would benefit from investigating what technical solutions the actors suggest and their possible compatibility.

References

Published sources

Arts, B., Leroy, P. & von Tatenhove, J. (2006). Political Modernisation and Policy Arrangements: A framework for Understanding Environmental Policy Change. Public Organiz Rev No 6. p 93-106.

Arts, B, et al (2010). Chapter 4 Discourses, actors and instruments in international forest governance. In. Embracing complexity – meeting the challenges of international forest governance. Tampere. IUFRO World Series Vol. 28. p 57-73.

Arts, B. & Buizer, M. (2008). Forest, discourses, institutions – a discursive-institutional analysis of global forest governance. Forest Policy and Economics. Doi: 10.1016/j.forpol.2008.10.0004.

Beckman L. (2007). Grundbok i idéanalys. Santérus förlag. Stockholm. ISBN 978-91-89449-79-4. In Swedish.

Björheden, R. (2006). Drivers behind the development of forest energy in Sweden. Biomass & Bioenergy. No. 30 p 289-295.

Bodlund, B. & Bergman, J. (1993). Bioenergy in Sweden: Potential, Technology, and Application. Bioresource Technology. No. 46 p 31-36.

Bush, T. (2005). Biodiversity and Sectoral Responsibility in Swedish Forestry policy 1988-1993. Southern Swedish Research Center, Alnarp. Swedish University of Agricultural Sciences.

Brännlund, R., Lundmark, R. & Söderholm, P. (2010) Kampen om skogen – Koka, såga, bränna eller bevara? Stockholm. SNS förlag. In Swedish.

Enander, K-G. (2007). Skogsbruk på samhällets villkor – Skogsskötsel och skogspolitik under 150 år. SLU. Umeå. In Swedish.

Energy Policy (2006). Renewable energy policies in the European Union. Guest editorial. Energy policy. No. 34 p. 251-255.

Ericsson, K., Huttunen, S., Nilsson, L.J. & Svenningsson, P. (2004). Bioenergy policy and market development in Finland and Sweden. Energy policy. No. 34 p. 1707-1721.

European Union (2009). Directive 2009/28/EC of the European parliament and of the council. Official Journal of the European Union. L 140/16.

Hirst, P. (2000). Democracy and Governance. In: Debating Governance – Authority, Steering, and Democracy. Ed. Pierre, J. Oxford University Press. New York. p. 13-35.

Johansson, T.B., & Turkenburg, W. (2004). Policies for renewable energy in the European Union and its member states: an overview. Energy for sustainable development. Vol VIII No. 1 p 5-24.

Kooiman, J. (2000). Societal Governance: Levels, modes, and Orders of Social-Political Interaction. In: Debating Governance – Authority, Steering, and Democracy. Ed. Pierre, J. Oxford University Press. New York. p. 138-164.

Krott, M. (2005). Forest policy analysis. Dordrecht, The Netherlands. Springer. ISBN: 9781402034787.

Knill, C. & Lehmkuhl, D. (2002). Private actors and the state: Internationalization and Changing Patterns of Governance. Governance 5 (1). p 41-64.

Lindkvist, A., Kardell, Ö. & Nordlund, C. (2011). Intensive forestry as progress or decay? An analysis of the debate about forest fertilization in Sweden, 1960-2010. Forests. No 2 p 112-146.

Meltsner, A.J. (1972). Political Feasibility and Policy Analysis. Public Administration Review. Vol. 32. No. 6 (Nov.-Dec.) pp.858-867.

Nilsson, L.J., Johansson, B., Åstrand, K., Ericsson, K., Svenningsson, P., Börjesson, P. & Neij, L. (2004). Seeing the wood for the trees: 25 years of renewable energy policy in Sweden. Energy for sustainable. Development. Vol. VIII No. 1 p. 67-81.

Ottosson, M. (2011). Skogsindustrin och energiomställningen. Forskning i fickformat. Tallinn, Estland. ISBN: 978-91-86797-03-4. In Swedish.

Teorell, J. & Svensson, T. (2006). Att fråga och att svara – en introduktion till samhällsvetenskaplig metod. Malmö. Liber. In Swedish.

Electronic sources

Government offices of Sweden (2010). Sveriges Nationella Handlingsplan för främjande av förnybar energi enligt Direktiv 2009/28/EG och Kommissionens beslut av den 30.6.2009- Bilaga till regeringsbeslut 2010-06-23, I27, Dnr 2010/742/E (delvis) 2009/7789/E. [online] (2010-06-30) Available from: http://www.regeringen.se/content/1/c6/14/90/23/968a6b5e.pdf [2012-05-21]

Government Offices of Sweden (2012a). Government terms. [online] Available from: http://www.sweden.gov.se/sb/d/2979 [2012-04-11]

Government offices of Sweden (2012b). The Swedish energy systems. Homepage. [online](2012-04-12) Available from: http://www.sweden.gov.se/sb/d/16022 [2012-05-21]

Government offices of Sweden (2012c). Search results, term used “IPCC”. Home page. [online] Available from: www.sweden.gov.se [2012-06-18]
Stoker, G. (1998). Governance as theory; five propositions. International Social Science Journal 155. Oxford. p 17-28.
Swedish Forest Agency (2011a). Wood fuel. In: Swedish Statistical Yearbook of Forestry 2011. [online]. Jönköping. Available from: http://www.skogsstyrelsen.se/Global/myndigheten/Statistik/Skogsstatistisk%20%C3%A5rsbok/01.%20Hela%202011%20-%20Entire%202011/Skogsstatistisk%20%C3%A5rsbok%202011%20(hela).pdf [2012-05-23]
Swedish Forest Agency (2011b). Estate and ownership structure. In: Swedish Statistical Yearbook of Forestry. [online] Huskvarna. Available from: http://www.skogsstyrelsen.se/Global/myndigheten/Statistik/Skogsstatistisk%20%C3%A5rsbok/02.%202011%20(Kapitelvis-Separated%20chapters)/02%20Fastighets-%20och%20%C3%A4garstruktur.pdf [2012-04-10]
Swedish Forest Agency (2008). Den fantastiska skogen. [online] Available from: http://www.skogsstyrelsen.se/Global/upptack-skogen/Presentationsmaterial/Den%20fantastiska%20%20skogen.pdf [2012-04-10] In Swedish.
Swedish Government (2008). Förändrat klimat kräver en utvecklad skogspolitik. In: En skogspolitik i takt med tiden. Regeringens proposition 2007/08:108, p.23-25. [online](2008-03-18) Available from: http://www.regeringen.se/content/1/c6/10/10/11/d1679652.pdf [2012-06-19] In Swedish.
Södra (2012). Detta är Södra 2011 – året i korthet. [online](2012-02-27) p.14. Available from: http://www.sodra.com/Documents/PDF/Finansiellt/arsredovisningar/Sodra_AR_2011-Del1-sv.pdf [2021-05-21] In Swedish.
Åström, M. et al (2011). Gasification of black liquor. [online](2011-07-01) Available from: http://www.etcpitea.se/pdf/BLG_eng.pdf [2012-05-24]

Other sources

Sjöstedt, V. (2011). Framework of categories provided by the first supervisor as a Word-document on the 21st of November 2011.

Appendices

Appendix 1. Classification schedule

		INFORMATION		
A0000	Coder	Name		
A0010	Date	Date of coding	E.g. 2011-11-29	
A0011	Year	Publication		
A0012	Month	Publication		
A0020	Number of the Article			E.g. 1001
A0030	Media Source		Where was the statement found?	
				E.g. home-page of actor, other web-page,
A0040	Section of the media			E.g. theme page "Forest", "Energy", "Climate"
A0051	Author Sources	Actor	Eg LRFS	
A0052	Name of the Author			
A0053	Name of News Agency			
A0060	Style Of Document			What kind of document was it? E.g. remissvar, policy document, news article,
A6010	Number of Statement in the Article		How many statements in the article discuss energy from the forest?	
		CATEGORIES		
C2001	Perspective of Statement (argument within positions)	Bioenergy from the forest and employment (obj)	1. Pro (Agree)	E.g. Forest energy will lead to more job opportunities for forest owners 2. Against (Disagree) E.g. Less job opportunities for people in the pulp- and paper sector 3. Indifferent E.g. Bioenergy from forest products will not change the employment rate.
C2002	Citation verifying the statement			
C2011		Bioenergy from the forest for rural development (obj)	1. Pro	E.g. Bioenergy from forest products will give job opportunities in the country side. The rural areas will benefit from forest energy production. People will find new ways of making a living in the countryside. 2. Against

				E.g. It will just be forest plantation taking over the beautiful countryside - it will not be very nice to live there. Bioenergy has negative impact on working opportunities in rural areas. Infrastructure in rural areas is destroyed. 3. Indifferent E.g. Forest energy will not change the rural development
C2012	Citation verifying the statement			
C2021		Bioenergy from the forest as a business opportunities	1. Pro	E.g. Bioenergy is a good way for companies in the wood sector, both small and big, to expand their businesses as they get more money for their products. New machines will be designed for forest energy harvesting. This means that new technologies are developed for forest energy. 2. Against E.g. Bioenergy will increase the price on wood/forest products - which is a threat for industries using wood/forest products in their production. 3. Indifferent No normative judgement.
C2022	Citation verifying the statement			
C2041		Bioenergy from the forest and biodiversity	1. Pro	Bioenergy is good for the biodiversity. The ashes from the bioenergy can solve the issue of biodiversity in the forests. 2. Against Bioenergy is bad for the biodiversity. Forest energy can reduce the biodiversity in forests as all tops and roots are taken from the forest land. To set up forest plantations on former grassland destroys habitats. 3. Indifferent Bioenergy does not change the conditions for biodiversity.
C2042	Citation verifying the statement			
C2051		Bioenergy from the forest and climate change	1. Pro	E.g. "Bioenergy will lower the use of fossil fuel and in the end lower the green house gas emissions" Positive - "Forest energy is a way of combating climate change as climate change is

				induced by the use of fossil fuels and forest energy can replace fossil fuels" 2. Against E.g. An increase use of bioenergy will lead to more greenhouse gas emissions. Negative carbon footprint through heavy use of fertilizers or long transport distances 3. Indifferent E.g. Bioenergy will not effect the climate change.
C2052	Citation verifying the statement			
C2061		Bioenergy from the forest and sustainability	1. Pro	E.g. Bioenergy will make a sustainable world possible. Forest energy is an important promoter to fully implement the energy turnaround on national scale (dt. Energiewende). 2. Against E.g. The use of bioenergy will not lead to a sustainable world. 3. Indifferent E.g. Bioenergy will not make a difference.
C2062	Citation verifying the statement			
C2071		Bioenergy from the forest and environment	1. Pro	E.g. Bioenergy is environmentally friendly. The usage of combined heat and power generation (CHP) in biomass power plants increases energy efficiency. 2. Against E.g. Bioenergy is not environmentally friendly in case the heating power can't be used (CHP) 3. Indifferent E.g. Bioenergy is neither environmentally friendly or hazardous.
C2072	Citation verifying the statement			
C2081		Bioenergy from forest products as a way of reaching the targets set by the state, the EU or the UN	1. Pro	E.g. Forest energy will make Sweden/Germany reach its target that is set by different actors 2. Against E.g. Forest energy will not help Sweden/Germany reach its targets 3. Indifferent E.g. Forest energy is just mentioned in the

C2082	Citation verifying the statement			
C2101		Forest energy from the forest and agricultural land usage	1. Pro	E.g. Better income for farmers if they setup forest plantations instead of growing corn. Utilize disused agricultural land for planting trees/forest. 2. Against E.g. To plant forest on former agricultural land reduces the area available for food production, which in turn increases food prices. 3. Indifferent
C2102	Citation verifying the statement			
C2111		Bioenergy from the forest for security		1. Pro E.g. Bioenergy is needed to secure future energy supply. We cannot rely on fossil fuel-producing countries, such as Russia etc. Bioenergy delivers a constant amount of electricity whereas electricity from wind power or solar is dependent on the weather. Bioenergy from the forest is an important contribution to energy supply. 2. Against E.g. Bioenergy will make us less energy independent 3. Indifferent E.g. Bioenergy will not make a difference regarding the security.
C2112	Citation verifying the statement			
C2121		Bioenergy from the forest and the need for knowledge & research & strategies	knowledge and	1. Pro E.g. There is need for more research 2. Against E.g. There is NO need for more knowledge and research 3. Indifferent
C2122	Citation verifying the statement			
C2131		Bioenergy from the forest and regulations/restrictions/rules	1. Pro	E.g. extraction of bioenergy from the forest should be restricted / Extraction of bioenergy from the forest should be regulated additionally / More regulations are good 2. Against E.g. extraction of bioenergy from the forest should NOT be restricted extraction of bioenergy

				from the forest should be regulated by simple, clear and few regulations more regulations are bad for bioenergy from the forest development 3. Indifferent
C2132	Citation verifying the statement			
C2141		Bioenergy from the forest as an assortment	1. Pro	E.g. bioenergy from the forest and timber should be treated in the same way and controlled by the same regulations 2. Against E.g. bioenergy from the forest is a special assortment that needs special regulations. Definitions/specifications 3. Indifferent No normative judgment
C2142	Citation verifying the statement			
C2151		Bioenergy from the forest and support/subsidiaries	1. Pro	E.g. bioenergy from the forest should be given support or subsidiaries 2. Against E.g. bioenergy from the forest should NOT be given support or subsidiaries 3. Indifferent
C2142	Citation verifying the statement			

Appendix 2. Governmental proposals referred for consideration central within the issue about bioenergy from the forest

Year	Reference number	Governmental body	Content	SSNC	LRFS	SFIF
2006	1257/06 4.42HK	Swedish Forest Agency	Forest fuel extraction and fertilization	X	X	X
2006	N2006/6984/HUB	Ministry of Enterprise, Energy & Consumption	Multi-value forest (Mervärdesskog)	X	X	X
2007	2007/4951	Swedish Forest Agency	Stump harvest	X	X	X
2007	373/06 4.49/HK	Swedish Forest Agency	Evaluation of Sustainable forests (Levande skogar)	X	X	X
2007	Jo2007/1715	Ministry for Rural affairs	Bioenergy from the agricultural sector	X	X	
2007	M2007/4227/Mk	Ministry of the Environment	Climate change – threats & possibilities	X	X	X
2007	N2007/1050/E	Ministry of Enterprise, Energy & Consumption	Oil commission	X	X	X
2008	2008/5646	Swedish Forest Agency	General counsel & regulations (Swedish forest legislation)	X		X
2008	M2008/1040/Mk	Climate Committee	Final report of the Climate Committee	X		X
2008	M2008/1443/Mk	Ministry of the Environment	Evaluation of Swedish environmental goals	X	X	X
2009	Jo2009/2619	Ministry for Rural Affairs	MINT – Possibilities with intensive forest management	X	X	X
2009	N2009/7508/E	Ministry of Enterprise, Energy & Consumption	Sustainability criterions	X	X	X
2010	N2010/5763/E	Ministry of Enterprise, Energy & Consumption	Implementation of sustainability criterions for biofuels	X	X	X
2010	N2010/742/E	Ministry of Enterprise, Energy & Consumption	National action plan for renewable energy	X	X	X

Publications from
The Department of Forest Products,
SLU, Uppsala

Rapporter/Reports

1. Ingemarson, F. 2007. De skogliga tjänstemännens syn på arbetet i Gudruns spår. Institutionen för skogens produkter, SLU, Uppsala
2. Lönnstedt, L. 2007. *Financial analysis of the U.S. based forest industry*. Department of Forest Products, SLU, Uppsala
4. Stendahl, M. 2007. *Product development in the Swedish and Finnish wood industry.* Department of Forest Products, SLU, Uppsala
5. Nylund, J-E. & Ingemarson, F. 2007. *Forest tenure in Sweden – a historical perspective.* Department of Forest Products, SLU, Uppsala
6. Lönnstedt, L. 2008. *Forest industrial product companies – A comparison between Japan, Sweden and the U.S.* Department of Forest Products, SLU, Uppsala
7. Axelsson, R. 2008. Forest policy, continuous tree cover forest and uneven-aged forest management in Sweden's boreal forest. Licentiate thesis. Department of Forest Products, SLU, Uppsala
8. Johansson, K-E.V. & Nylund, J-E. 2008. NGO Policy Change in Relation to Donor Discourse. Department of Forest Products, SLU, Uppsala
9. Uetimane Junior, E. 2008. Anatomical and Drying Features of Lesser Known Wood Species from Mozambique. Licentiate thesis. Department of Forest Products, SLU, Uppsala
10. Eriksson, L., Gullberg, T. & Woxblom, L. 2008. Skogsbruksmetoder för privatskogs-brukaren. *Forest treatment methods for the private forest owner.* Institutionen för skogens produkter, SLU, Uppsala
11. Eriksson, L. 2008. Åtgärdsbeslut i privatskogsbruket. *Treatment decisions in privately owned forestry.* Institutionen för skogens produkter, SLU, Uppsala
12. Lönnstedt, L. 2009. *The Republic of South Africa's Forets Sector.* Department of Forest Products, SLU, Uppsala
13. Blicharska, M. 2009. *Planning processes for transport and ecological infrastructures in Poland – actors' attitudes and conflict.* Licentiate thesis. Department of Forest Products, SLU, Uppsala
14. Nylund, J-E. 2009. *Forestry legislation in Sweden*. Department of Forest Products, SLU, Uppsala
15. Björklund, L., Hesselman, J., Lundgren, C. & Nylinder, M. 2009. Jämförelser mellan metoder för fastvolymbestämning av stockar. Institutionen för skogens produkter, SLU, Uppsala
16. Nylund, J-E. 2010. *Swedish forest policy since 1990 – reforms and consequences***.** Department of Forest Products, SLU, Uppsala
17. Eriksson, L., m.fl. 2011. Skog på jordbruksmark – erfarenheter från de senaste decennierna. Institutionen för skogens produkter, SLU, Uppsala
18. Larsson, F. 2011. Mätning av bränsleved – Fastvolym, torrhalt eller vägning? Institutionen för skogens produkter, SLU, Uppsala
19. Karlsson, R., Palm, J., Woxblom, L. & Johansson, J. 2011. Konkurrenskraftig kundanpassad affärsutveckling för lövträ - Metodik för samordnad affärs- och teknikutveckling inom leverantörskedjan för björkämnen. Institutionen för skogens produkter, SLU, Uppsala

Examensarbeten/Master Thesis

1. Stangebye, J. 2007. Inventering och klassificering av kvarlämnad virkesvolym vid slutavverkning. *Inventory and classification of non-cut volumes at final cut operations.* Institutionen för skogens produkter, SLU, Uppsala
2. Rosenquist, B. 2007. Bidragsanalys av dimensioner och postningar – En studie vid Vida Alvesta. *Financial analysis of economic contribution from dimensions and sawing patterns – A study at Vida Alvesta.* Institutionen för skogens produkter, SLU, Uppsala
3. Ericsson, M. 2007. En lyckad affärsrelation? – Två fallstudier. *A successful business relation? – Two case studies.* Institutionen för skogens produkter, SLU, Uppsala
4. Ståhl, G. 2007. Distribution och försäljning av kvalitetsfuru – En fallstudie. *Distribution and sales of high quality pine lumber – A case study*. Institutionen för skogens produkter, SLU, Uppsala
5. Ekholm, A. 2007. Aspekter på flyttkostnader, fastighetsbildning och fastighetstorlekar. *Aspects on fixed harvest costs and the size and dividing up of forest estates.* Institutionen för skogens produkter, SLU, Uppsala

6. Gustafsson, F. 2007. Postningsoptimering vid sönderdelning av fura vid Säters Ångsåg. *Saw pattern optimising for sawing Scots pine at Säters Ångsåg*. Institutionen för skogens produkter, SLU, Uppsala
7. Götherström, M. 2007. Följdeffekter av olika användningssätt för vedråvara – en ekonomisk studie. *Consequences of different ways to utilize raw wood – an economic study*. Institutionen för skogens produkter, SLU, Uppsala
8. Nashr, F. 2007. *Profiling the strategies of Swedish sawmilling firms.* Department of Forest Products, SLU, Uppsala
9. Högsborn, G. 2007. Sveriges producenter och leverantörer av limträ – En studie om deras marknader och kundrelationer. *Swedish producers and suppliers of glulam – A study about their markets and customer relations.* Institutionen för skogens produkter, SLU, Uppsala
10. Andersson, H. 2007. *Establishment of pulp and paper production in Russia – Assessment of obstacles.* Etablering av pappers- och massaproduktion i Ryssland – bedömning av möjliga hinder. Department of Forest Products, SLU, Uppsala
11. Persson, F. 2007. Exponering av trägolv och lister i butik och på mässor – En jämförande studie mellan sport- och bygghandeln. Institutionen för skogens produkter, SLU, Uppsala
12. Lindström, E. 2008. En studie av utvecklingen av drivningsnettot i skogsbruket. *A study of the net conversion contribution in forestry.* Institutionen för skogens produkter, SLU, Uppsala
13. Karlhager, J. 2008. *The Swedish market for wood briquettes – Production and market development.* Department of Forest Products, SLU, Uppsala
14. Höglund, J. 2008. *The Swedish fuel pellets industry: Production, market and standardization*. Den Svenska bränslepelletsindustrin: Produktion, marknad och standardisering. Department of Forest Products, SLU, Uppsala
15. Trulson, M. 2008. Värmebehandlat trä – att inhämta synpunkter i produktutvecklingens tidiga fas. *Heat-treated wood – to obtain opinions in the early phase of product development.* Institutionen för skogens produkter, SLU, Uppsala
16. Nordlund, J. 2008. Beräkning av optimal batchstorlek på gavelspikningslinjer hos Vida Packaging i Hestra. *Calculation of optimal batch size on cable drum flanges lines at Vida Packaging in Hestra*. Institutionen för skogens produkter, SLU, Uppsala
17. Norberg, D. & Gustafsson, E. 2008. *Organizational exposure to risk of unethical behaviour – In Eastern European timber purchasing organizations.* Department of Forest Products, SLU, Uppsala
18. Bäckman, J. 2008. Kundrelationer – mellan Setragroup AB och bygghandeln. *Customer Relationsship – between Setragroup AB and the DIY-sector.* Institutionen för skogens produkter, SLU, Uppsala
19. Richnau, G. 2008. *Landscape approach to implement sustainability policies? - value profiles of forest owner groups in the Helgeå river basin, South Sweden.* Department of Forest Products, SLU, Uppsala
20. Sokolov, S. 2008. *Financial analysis of the Russian forest product companies.* Department of Forest Products, SLU, Uppsala
21. Färlin, A. 2008. *Analysis of chip quality and value at Norske Skog Pisa Mill, Brazil*. Department of Forest Products, SLU, Uppsala
22. Johansson. N. 2008. *An analysis of the North American market for wood scanners.* En analys över den Nordamerikanska marknaden för träscanners. Department of Forest Products, SLU, Uppsala
23. Terzieva, E. 2008. *The Russian birch plywood industry – Production, market and future prospects*. Den ryska björkplywoodindustrin – Produktion, marknad och framtida utsikter. Department of Forest Products, SLU, Uppsala
24. Hellberg, L. 2008. Kvalitativ analys av Holmen Skogs internprissättningsmodell. *A qualitative analysis of Holmen Skogs transfer pricing method.* Institutionen för skogens produkter, SLU, Uppsala
25. Skoglund, M. 2008. Kundrelationer på Internet – en utveckling av Skandias webbplats. *Customer relationships through the Internet – developing Skandia's homepages.* Institutionen för skogens produkter, SLU, Uppsala
26. Hesselman, J. 2009. Bedömning av kunders uppfattningar och konsekvenser för strategisk utveckling. *Assessing customer perceptions and their implications for strategy development.* Institutionen för skogens produkter, SLU, Uppsala
27. Fors, P-M. 2009. *The German, Swedish and UK wood based bio energy markets from an investment perspective, a comparative analysis.* Department of Forest Products, SLU, Uppsala
28. Andræ, E. 2009. *Liquid diesel biofuel production in Sweden – A study of producers using forestry- or agricultural sector feedstock.* Produktion av förnyelsebar diesel – en studie av producenter av biobränsle från skogs- eller jordbrukssektorn. Department of Forest Products, SLU, Uppsala
29. Barrstrand, T. 2009. Oberoende aktörer och Customer Perceptions of Value. *Independent actors and Customer Perception of Value.* Institutionen för skogens produkter, SLU, Uppsala

30. Fälldin, E. 2009. Påverkan på produktivitet och produktionskostnader vid ett minskat antal timmerlängder. *The effect on productivity and production cost due to a reduction of the number of timber lengths.* Institutionen för skogens produkter, SLU, Uppsala
31. Ekman, F. 2009. Stormskadornas ekonomiska konsekvenser – Hur ser försäkringsersättningsnivåerna ut inom familjeskogsbruket? *Storm damage's economic consequences – What are the levels of compensation for the family forestry?* Institutionen för skogens produkter, SLU, Uppsala
32. Larsson, F. 2009. Skogsmaskinföretagarnas kundrelationer, lönsamhet och produktivitet. *Customer relations, profitability and productivity from the forest contractors point of view.* Institutionen för skogens produkter, SLU, Uppsala
33. Lindgren, R. 2009. Analys av GPS Timber vid Rundviks sågverk. *An analysis of GPS Timber at Rundvik sawmill.* Institutionen för skogens produkter, SLU, Uppsala
34. Rådberg, J. & Svensson, J. 2009. Svensk skogsindustris framtida konkurrensfördelar – ett medarbetar-perspektiv. *The competitive advantage in future Swedish forest industry – a co-worker perspective.* Institutionen för skogens produkter, SLU, Uppsala
35. Franksson, E. 2009. Framtidens rekrytering sker i dag – en studie av ingenjörsstudenters uppfattningar om Södra. *The recruitment of the future occurs today – A study of engineering students' perceptions of Södra.* Institutionen för skogens produkter, SLU, Uppsala
36. Jonsson, J. 2009. *Automation of pulp wood measuring – An economical analysis.* Department of Forest Products, SLU, Uppsala
37. Hansson, P. 2009. *Investment in project preventing deforestation of the Brazilian Amazonas***.** Department of Forest Products, SLU, Uppsala
38. Abramsson, A. 2009. Sydsvenska köpsågverksstrategier vid stormtimmerlagring. *Strategies of storm timber storage at sawmills in Southern Sweden.* Institutionen för skogens produkter, SLU, Uppsala
39. Fransson, M. 2009. Spridning av innovationer av träprodukter i byggvaruhandeln. *Diffusion of innovations – contrasting adopters views with non adopters.* Institutionen för skogens produkter, SLU, Uppsala
40. Hassan, Z. 2009. *A Comparison of Three Bioenergy Production Systems Using Lifecycle Assessment.* Department of Forest Products, SLU, Uppsala
41. Larsson, B. 2009. Kunders uppfattade värde av svenska sågverksföretags arbete med CSR. *Customer perceived value of Swedish sawmill firms work with CSR.* Institutionen för skogens produkter, SLU, Uppsala
42. Raditya, D. A. 2009. *Case studies of Corporate Social Responsibility (CSR) in forest products companies - and customer's perspectives.* Department of Forest Products, SLU, Uppsala
43. Cano, V. F. 2009. *Determination of Moisture Content in Pine Wood Chips.* Bachelor Thesis. Department of Forest Products, SLU, Uppsala
44. Arvidsson, N. 2009. Argument för prissättning av skogsfastigheter. *Arguments for pricing of forest estates.* Institutionen för skogens produkter, SLU, Uppsala
45. Stjernberg, P. 2009. Det hyggesfria skogsbruket vid Yttringe – vad tycker allmänheten? *Continuous cover forestry in Yttringe – what is the public opinion?* Institutionen för skogens produkter, SLU, Uppsala
46. Carlsson, R. 2009. *Fire impact in the wood quality and a fertilization experiment in Eucalyptus plantations in Guangxi, southern China.* Brandinverkan på vedkvaliteten och tillväxten i ett gödselexperiment i Guangxi, södra Kina. Department of Forest Products, SLU, Uppsala
47. Jerenius, O. 2010. Kundanalys av tryckpappersförbrukare i Finland. *Customer analysis of paper printers in Finland.* Institutionen för skogens produkter, SLU, Uppsala
48. Hansson, P. 2010. Orsaker till skillnaden mellan beräknad och inmätt volym grot. *Reasons for differences between calculated and scaled volumes of tops and branches.* Institutionen för skogens produkter, SLU, Uppsala
49. Eriksson, A. 2010. *Carbon Offset Management - Worth considering when investing for reforestation CDM.* Department of Forest Products, SLU, Uppsala
50. Fallgren, G. 2010. På vilka grunder valdes limträleverantören? – En studie om hur Setra bör utveckla sitt framtida erbjudande. *What was the reason for the choise of glulam deliverer? -A studie of proposed future offering of Setra.* Institutionen för skogens produkter, SLU, Uppsala
51. Ryno, O. 2010. Investeringskalkyl för förbättrat värdeutbyte av furu vid Krylbo sågverk. *Investment Calculation to Enhance the Value of Pine at Krylbo Sawmill.* Institutionen för skogens produkter, SLU, Uppsala
52. Nilsson, J. 2010. Marknadsundersökning av färdigkapade produkter. *Market investigation of pre cut lengths.* Institutionen för skogens produkter, SLU, Uppsala
53. Mörner, H. 2010. Kundkrav på biobränsle. *Customer Demands for Bio-fuel*. Institutionen för skogens produkter, SLU, Uppsala

54. Sunesdotter, E. 2010. Affärsrelationers påverkan på Kinnarps tillgång på FSC-certifierad råvara. Business Relations Influence on Kinnarps' Supply of FSC Certified Material. Institutionen för skogens produkter, SLU, Uppsala
55. Bengtsson, W. 2010. Skogsfastighetsmarknaden, 2005-2009, i södra Sverige efter stormarna. *The market for private owned forest estates, 2005-2009, in the south of Sweden after the storms*. Institutionen för skogens produkter, SLU, Uppsala
56. Hansson, E. 2010. Metoder för att minska kapitalbindningen i Stora Enso Bioenergis terminallager. *Methods to reduce capital tied up in Stora Enso Bioenergy terminal stocks.* Institutionen för skogens produkter, SLU, Uppsala
57. Johansson, A. 2010. Skogsallmänningars syn på deras bankrelationer. *The commons view on their bank relations*. Institutionen för skogens produkter, SLU, Uppsala
58. Holst, M. 2010. Potential för ökad specialanpassning av trävaror till byggföretag – nya möjligheter för träleverantörer? *Potential for greater customization of the timber to the construction company – new opportunities for wood suppliers?* Institutionen för skogens produkter, SLU, Uppsala
59. Ranudd, P. 2010. Optimering av råvaruflöden för Setra. Optimizing Wood Supply for Setra. Institutionen för skogens produkter, SLU, Uppsala
60. Lindell, E. 2010. Rekreation och Natura 2000 – målkonflikter mellan besökare och naturvård i Stendörrens naturreservat. *Recreation in Natura 2000 protected areas – visitor and conservation conflicts*. Institutionen för skogens produkter, SLU, Uppsala
61. Coletti Pettersson, S. 2010. Konkurrentanalys för Setragroup AB, Skutskär. *Competitive analysis of Setragroup AB, Skutskär*. Institutionen för skogens produkter, SLU, Uppsala
62. Steiner, C. 2010. Kostnader vid investering i flisaggregat och tillverkning av pellets – En komparativ studie. *Expenses on investment in wood chipper and production of pellets – A comparative study.* Institutionen för skogens produkter, SLU, Uppsala
63. Bergström, G. 2010. Bygghandelns inköpsstrategi för träprodukter och framtida efterfrågan på produkter och tjänster. *Supply strategy for builders merchants and future demands for products and services.* Institutionen för skogens produkter, SLU, Uppsala
64. Fuente Tomai, P. 2010. *Analysis of the Natura 2000 Networks in Sweden and Spain.* Department of Forest Products, SLU, Uppsala
65. Hamilton, C-F. 2011. Hur kan man öka gallringen hos privata skogsägare? En kvalitativ intervjustudie. *How to increase the thinning at private forest owners? A qualitative questionnaire.* Institutionen för skogens produkter, SLU, Uppsala
66. Lind, E. 2011. Nya skogsbaserade material – Från Labb till Marknad. *New wood based materials – From Lab to Market.* Institutionen för skogens produkter, SLU, Uppsala
67. Hulusjö, D. 2011. Förstudie om e-handel vid Stora Enso Packaging AB. *Pilot study on e-commerce at Stora Enso Packaging AB*. Institutionen för skogens produkter, SLU, Uppsala
68. Karlsson, A. 2011. Produktionsekonomi i ett lövsågverk. *Production economy in a hardwood sawmill.* Institutionen för skogens produkter, SLU, Uppsala
69. Bränngård, M. 2011. En konkurrensanalys av SCA Timbers position på den norska bygghandelsmarknaden. *A competitive analyze of SCA Timbers position in the Norwegian builders merchant market.* Institutionen för skogens produkter, SLU, Uppsala
70. Carlsson, G. 2011. Analysverktyget Stockluckan – fast eller rörlig postning? *Fixed or variable tuning in sawmills? – an analysis model.* Institutionen för skogens produkter, SLU, Uppsala
71. Olsson, A. 2011. Key Account Management – hur ett sågverksföretag kan hantera sina nyckelkunder. *Key Account Management – how a sawmill company can handle their key customers.* Institutionen för skogens produkter, SLU, Uppsala
72. Andersson, J. 2011. Investeringsbeslut för kraftvärmeproduktion i skogsindustrin. *Investment decisions for CHP production in The Swedish Forest Industry*. Institutionen för skogens produkter, SLU, Uppsala
73. Bexell, R. 2011. Hög fyllnadsgrad i timmerlagret – En fallstudie av Holmen Timbers sågverk i Braviken. *High filling degree in the timber yard – A case study of Holmen Timber´s sawmill in Braviken*. Institutionen för skogens produkter, SLU, Uppsala
74. Bohlin, M. 2011. Ekonomisk utvärdering av ett grantimmersortiment vid Bergkvist Insjön. *Economic evaluation of one spruce timber assortment at Bergkvist Insjön*. Institutionen för skogens produkter, SLU, Uppsala
75. Enqvist, I. 2011. Psykosocial arbetsmiljö och riskbedömning vid organisationsförändring på Stora Enso Skutskär. *Psychosocial work environment and risk assessment prior to organizational change at Stora Enso Skutskär.* Institutionen för skogens produkter, SLU, Uppsala
76. Nylinder, H. 2011. Design av produktkalkyl för vidareförädlade trävaror. *Product Calculation Design For Planed Wood Products*. Institutionen för skogens produkter, SLU, Uppsala

77. Holmström, K. 2011. Viskosmassa – framtid eller fluga. *Viscose pulp – fad or future*. Institutionen för skogens produkter, SLU, Uppsala
78. Holmgren, R. 2011. Norra Skogsägarnas position som trävaruleverantör – en marknadsstudie mot bygghandeln i Sverige och Norge. *Norra Skogsagarnas position as a wood-product supplier – A market investigation towards the builder-merchant segment in Sweden and Norway*. Institutionen för skogens produkter, SLU, Uppsala
79. Carlsson, A. 2011. Utvärdering och analys av drivningsentreprenörer utifrån offentlig ekonomisk information. *Evaluation and analysis of harvesting contractors on the basis of public financial information.* Institutionen för skogens produkter, SLU, Uppsala
80. Karlsson, A. 2011. Förutsättningar för betalningsgrundande skördarmätning hos Derome Skog AB. *Possibilities for using harvester measurement as a basis for payment at Derome Skog AB.* Institutionen för skogens produkter, SLU, Uppsala
81. Jonsson, M. 2011. Analys av flödesekonomi - Effektivitet och kostnadsutfall i Sveaskogs verksamhet med skogsbränsle. *Analysis of the Supply Chain Management - Efficiency and cost outcomes of the business of forest fuel in Sveaskog.* Institutionen för skogens produkter, SLU, Uppsala
82. Olsson, J. 2011. Svensk fartygsimport av fasta trädbaserade biobränslen – en explorativ studie. *Swedish import of solid wood-based biofuels – an exploratory study.* Institutionen för skogens produkter, SLU, Uppsala
83. Ols, C. 2011. *Retention of stumps on wet ground at stump-harvest and its effects on saproxylic insects.* Bevarande av stubbar vid stubbrytning på våt mark och dess inverkan på vedlevande insekter. Department of Forest Products, SLU, Uppsala
84. Börjegren, M. 2011. Utvärdering av framtida mätmetoder. *Evaluation of future wood measurement methods.* Institutionen för skogens produkter, SLU, Uppsala
85. Engström, L. 2011. Marknadsundersökning för högvärdiga produkter ur klenkubb. *Market survey for high-value products from thin sawn timber.* Institutionen för skogens produkter, SLU, Uppsala
86. Thorn-Andersen, B. 2012. Nuanskaffningskostnad för Jämtkrafts fjärrvärmeanläggningar. *Today-acquisition-cost for the district heating facilities of Jämtkraft.* Institutionen för skogens produkter, SLU, Uppsala
87. Norlin, A. 2012. Skogsägarföreningarnas utveckling efter krisen i slutet på 1970-talet – en analys av förändringar och trender. *The development of forest owners association's in Sweden after the crisis in the late 1970s – an analysis of changes and trends.* Institutionen för skogens produkter, SLU, Uppsala
88. Johansson, E. 2012. Skogsbränslebalansen i Mälardalsområdet – Kraftvärmeverkens syn på råvaruförsörjningen 2010-2015. *The balance of wood fuel in the region of Mälardalen – The CHP plants view of the raw material supply 2010-2015.* Institutionen för skogens produkter, SLU, Uppsala
89. Biruk, K. H. 2012. *The Contribution of Eucalyptus Woodlots to the Livelihoods of Small Scale Farmers in Tropical and Subtropical Countries with Special Reference to the Ethiopian Highlands.* Department of Forest Products, SLU, Uppsala
90. Otuba, M. 2012. *Alternative management regimes of Eucalyptus: Policy and sustainability issues of smallholder eucalyptus woodlots in the tropics and sub-tropics.* Department of Forest Products, SLU, Uppsala
91. Edgren, J. 2012. *Sawn softwood in Egypt – A market study.* En marknadsundersökning av den Egyptiska barrträmarknaden. Department of Forest Products, SLU, Uppsala
92. Kling, K. 2012. *Analysis of eucalyptus plantations on the Iberian Peninsula.* Department of Forest Products, SLU, Uppsala
93. Heikkinen, H. 2012. Mätning av sorteringsdiameter för talltimmer vid Kastets sågverk. *Measurement of sorting diameter for pine logs at Kastet Sawmill.* Institutionen för skogens produkter, SLU, Uppsala
94. Munthe-Kaas, O. S. 2012. Markedsanalyse av skogforsikring i Sverige og Finland. *Market analysis of forest insurance in Sweden and Finland.* Institutionen för skogens produkter, SLU, Uppsala
95. Dietrichson, J. 2012. Specialsortiment på den svenska rundvirkesmarknaden – En kartläggning av virkeshandel och -mätning. *Special assortments on the Swedish round wood market – A survey of wood trade and measuring*. Institutionen för skogens produkter, SLU, Uppsala
96. Holmquist, V. 2012. Timmerlängder till Iggesunds sågverk. *Timber lenghts for Iggesund sawmill*. Institutionen för skogens produkter, SLU, Uppsala
97. Wallin, I. 2012. *Bioenergy from the forest – a source of conflict between forestry and nature conservation? – an analysis of key actor's positions in Sweden.* Department of Forest Products, SLU, Uppsala

Distribution
Sveriges lantbruksuniversitet
Institutionen för skogens produkter
Department of Forest Products
Box 7008
SE-750 07 Uppsala, Sweden
Tfn. +46 (0) 18 67 10 00
Fax: +46 (0) 18 67 34 90
E-mail: sprod@slu.se