Environmental Policy Integration in Bioenergy

Policy learning across sectors and levels?

Charlotta Söderberg
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To Sven-Inge Söderberg (1925-2010)
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Svensk sammanfattning

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List of Papers

This thesis builds on the studies undertaken in the following four appended papers, which are referred to by the corresponding Roman numerals in the text:


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Abstract

A central principle within UN and EU policy is environmental policy integration (EPI), aiming at integrating environmental aspirations, targets and requirements into sector policy in order to promote sustainable development. The focus of this study is EPI in bioenergy policy. Bioenergy is a renewable energy source of increasing importance in the EU and Swedish energy mix. At the same time, it is debated how environmentally friendly bioenergy really is. Furthermore, bioenergy can be considered both a multi-sector and a multi-level case, since bioenergy is produced in many different sectors and bioenergy policy is formulated and implemented on different levels. Therefore, EPI in bioenergy policy is here analysed over time in two sectors (energy and agriculture) and on three levels (EU, national, sub-national). A cognitive, policy learning perspective on EPI is adopted, tracing EPI through looking for reframing of policy towards incorporating environmental objectives in policy rhetoric and practice. Furthermore, institutional and political explanations for the development are discussed. Paper I analyses EPI in Swedish bioenergy policy within energy and agriculture. Paper II analyses institutional conditions for multi-sector EPI in Swedish bioenergy policy. Paper III analyses EPI in EU bioenergy policy within energy and agriculture. Paper IV analyses sub-national EPI in the case of the Biofuel Region in north Sweden. The material examined consists of policy documents complemented by semi-structured interviews.

Together, the four papers provide a more complex and holistic picture of the EPI process than in previous research, which mainly has focused on studying EPI in single sectors and on single levels. The study shows that priorities are different on different levels; that EPI has varied over time; but that EPI today is detectable within bioenergy policy in both studied sectors and on all levels. Policy learning in bioenergy is found to be mainly a top-down process. Furthermore, policy coherence between sectors and levels; long-term goals; and concrete policy instruments are found to be important both for the EPI process as such and for the outcomes from this process. However, when attempting to marry different goals, such as growth, security and sustainability, in line with the three-tiered (economic, social, ecologic) sustainable development concept, environmental aspects risks not to be prioritised when goal conflicts arise. The study proposes that future research both continues the analysis of multi-sector and multi-level EPI, and further explores to what extent ecological sustainability is improved by EPI.

Keywords: environmental policy integration, sustainability, multi-level EPI, multi-sector EPI, learning, frames, bioenergy, energy, agriculture, EU, Sweden
Acknowledgements

A lifetime contains only a few breaking moments. Such moments when you know that from then on, nothing is ever going to be the same again. One such moment occurred when, freshly graduated MSc in Political Science, I was driving my orange-brown, rusty 1980’s Ford Fiesta through the streets of Luleå an early summers’ day in 2004 and received a phone call. The voice in the other end said she had positive news and offered me the job as research assistant within the PINTS project, where my journey towards finishing this PhD thesis began. Therefore, a first and deeply sincere thank you goes to my supervisor Katarina Eckerberg for phoning me up that day, for encouraging me to start a PhD project, and for believing in me and supporting me throughout this process. A sincere thank you also goes to my assistant supervisor Chris Hudson. Thank you for always being supportive, for your valuable language remarks, for providing new perspectives on my texts and for your highly valuable advice regarding academic work as well as life in general.

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Östermalm, Luleå
31 March 2011

Charlotta Söderberg
Chapter one: Introduction

*Look for the bare necessities, the simple bare necessities, forget about you worries and your strife. I mean the bare necessities, Old Mother Nature’s recipes, that brings the bare necessities of life (Baloo, The Jungle Book).*

It is an undisputed fact that absolute necessities required for human life are drawn from, and are thus dependent upon, nature. Plainly, we humans as a species will not survive long without access to adequate supplies of such goods as breathable air, drinkable water and edible food. For that reason, the Oneida Indians always asked “who speaks for wolf?” in their meetings (Foreman, 1991). Even though today’s human beings are just as dependent on nature’s necessities as the Oneida Indians were, asking such a question does not come naturally in contemporary society. At the same time, ecological imbalances, which stem from the Western lifestyle, are affecting the supplies of vital prerequisite requirements for human life, as well as those which are necessary for other life forms. Therefore, regardless of whether we have an ecocentric outlook, which places the eco-system in focus, or in a true anthropocentric spirit place human needs in focus, both the ecocentric question of “who speaks for nature”, or, with a more anthropocentric touch, “who speaks for present (and future) human generations” are highly valid, and progressively more critical questions.

This thesis addresses the endeavour to, just like the Oneida Indians once did, incorporate the environment into every single one of our decisions, in all sectors, and on all levels, of society. This principle is also known as Environmental Policy Integration (EPI), and has been of central relevance for the EU and its Member States for more than a decade (Amsterdam Treaty, Article 6; Lisbon Treaty, Article 6.1).

Persson (2004, p. 1) defines EPI as “the integration of environmental aspects and policy objectives into sector policies”. At a first glance, this may sound like a straightforward task for policymakers, but when taking a closer look at EPI its complexity soon becomes evident and a key question emerges: which environmental aspects are to be integrated? Therefore, I will begin by recognising that EPI can be viewed as a contested concept in the sense that it is disputed what ‘successful’ EPI stands for. First, what does the ‘E’ in EPI represent; what ‘environment’ is to be integrated? Second, what does the ‘I’ in EPI signify; when do we have ‘integration’? Is EPI ensured, in a ‘weak’ sense, as long as ‘environment’ is simply taken into consideration alongside other sector issues? Or can EPI be considered to have been achieved, in a ‘strong’ sense, only when ‘environment’ is given priority, and placed above all other sector interests? (Jordan and Shout, 2006). Thus, defining the ‘E’ and the ‘I’ is central in any EPI study. In addition, this thesis will add more complexity to the already contested EPI-concept, since the case to be studied...
is the – currently much debated – issue of bioenergy policy (see e.g. SSNC, 2011; IIEP, 2010; Paper IV), which will be analysed with an EPI perspective both on three political/administrative levels (EU, national, sub-national) and with regard to multiple sectors (energy, agriculture). Bioenergy is debated, both in terms of the ‘E’ (how environmentally friendly is bioenergy?), and in terms of the ‘I’ (what role should environmental issues play for bioenergy policy on different policy levels?). This study will contribute with a new, more complex and holistic picture of the EPI process than what has been provided in previous research, which (as will be elaborated below) mainly focus on examining EPI within single sectors and on single levels at one time. When the aim, scope and focus is further discussed below, it will become clear that this study seeks to provide a new way of approaching EPI, a new way to pose questions on EPI, and new empirical evidence on EPI in bioenergy policy.

It is relevant to explore the issue of environmental policy integration in the context of bioenergy policy because bioenergy refers to all different types of energy (both electricity and fuels for transport) generated from biofuels, which are derived from biomass (by-products from forestry and agriculture, municipal and industrial waste streams, and dedicated energy crop cultivation). Therefore, environmental policy integration in bioenergy involves not just one single sector, but many different sectors, which may create incoherence and thus increases the complexity of EPI within bioenergy policy. This means that this thesis will provide a new perspective on EPI, which also has relevance for many other cross-cutting issues: multi-sector EPI (Paper I, II, III, Thesis). Furthermore, bioenergy has been identified by the Commission as being of increasing importance for the EU in the fulfilment of its goal of 20 percent renewable energy in 2020, as well as that of its goal of 10 percent biofuel in the transport sector in 2020 (EC, 2006a). This implies that the interest in bioenergy has largely risen from an increased relevance of renewable energy sources; at the same time the environmental benefits from bioenergy use are highly contested, especially with regard to bioliquids (e.g. bioethanol) in transport (see e.g. IEEP, 2010, Silveira, 2011; Paper IV). Therefore, the role of the environment in bioenergy is both a highly complex and contested issue, the exploration of which is highly relevant from an EPI perspective. At the same time, bioenergy goals depend upon policies on multiple levels, from the EU-level to the national and sub-national level. As will be elaborated below, previous studies of EPI mainly focus on one political/administrative level at a time, or on a comparison of the EU and national levels. It is argued here that it is important to explore the role of environmental issues in bioenergy policy on all three related levels simultaneously, in order to present a holistic view of the environmental policy integration process: multi-level EPI (Paper I, III, IV, Thesis).
According to Lenschow and Jordan (2010), there are three main different ways of approaching EPI: it can be viewed mainly as a policy coordination problem; as a problem of political conflict; or as a learning process:

*EPI can be thought of as learning between actors in the policy network leading to changes in sector policy-making processes and outputs as a result of new mandates of environmental concerns and knowledge about environmental consequences (Nilsson and Persson, 2003, page 340).*

In this thesis, EPI is viewed as a learning process. Focus lies on the analysis of how policy changes, and whether or not environmental issues are considered within policy. Therefore, learning is studied here on a collective, rather than individual level, and focuses on policy learning, traced through reframing within policy.

**Aim of the thesis**

The aim of this thesis is to analyse the EPI process in a multi-sector issue, with a multi-level perspective, over time. Through this take on EPI, the thesis seeks to provide both theoretical and empirical contributions. The theoretical ambitions are to develop the knowledge-base regarding multi-sector EPI; furthermore, to provide EPI theory with new insights into multi-level EPI. The empirical ambitions are to elucidate the role of environmental concerns within Swedish and EU bioenergy policy; to provide an EPI case study covering one issue (bioenergy) across various sectors and from the supra-national to the sub-national level over time; and, finally, to cover an issue where the ‘E’ and the ‘I’ are contested in order to provide input to the debate on weak/strong EPI.

**Research questions**

Drawing on four appended papers (summarised below), focus lies on exploring how different sectors and political levels interrelate in the area of bioenergy; how bioenergy is framed within different sectors and on different political levels (e.g. as a security issue, economic issue or environmental issue); and to compare the development over time in order to explore both policy learning and how EPI travels between sectors and levels. Therefore, the four following overarching research questions will be addressed in the thesis:

1) *How can EPI be detected and ‘measured’, and how is EPI conceived in policy documents?*

This first research question focuses on exploring the theoretical and political background to EPI; discussing how to analytically detect and ‘measure’ EPI;
Introduction

what the ‘E’ and the ‘I’ in EPI stand for and what constitutes weak/strong EPI; and how EPI is conceived in background policy documents.

2) How does EPI in a multi-sector issue (bioenergy) travel between different sectors?

The second research question mainly focuses on discussing what a multi-sector perspective on EPI constitutes; if there are any differences between single-sector EPI and multi-sector EPI (and, if yes, what these differences are); and if (and if so, how) different sectors seem to learn from each other.

3) How does EPI in a multi-level issue (bioenergy) travel between different levels of government?

In the third research question, focus is placed on how EPI can be regarded from the point of view of multi-level governance; if there are any differences between EPI in bioenergy on different levels of government, and what the implications of this are; and if (and if so, how) different levels seem to learn from each other.

4) Is there policy learning over time, indicating EPI in bioenergy policy, and what factors can be identified as important for multi-sector/multi-level EPI in bioenergy?

In the fourth and final research question, focus lies on discussing whether there is policy learning indicating EPI over time within bioenergy policy; if the detected EPI can be considered weak or strong and what the implications of this are; and, what political and institutional factors can be identified as important for the development of multi-sector and multi-level EPI.

Organisation of the thesis

The thesis consists of two main sections. The first part provides a theoretical framework for the study and a summary of its findings, divided into five chapters. In this first introductory chapter, the aim and objective of the thesis have been introduced. In Chapter two, previous EPI research and EPI policy development are discussed and a background to bioenergy is provided. In Chapter three, the analytical framework is presented, as different perspectives on EPI and the theoretical relevance of the thesis are discussed and definitions of key concepts are provided. Chapter four of the thesis moves on to methodological reflections and research design. Chapter five draws together the findings from the four appended papers and reflects upon the multi-level, multi-sector EPI process of bioenergy policy and how this study may contribute to future EPI research. The second part consists of four papers, each contributing to different aspects of the study. Table 1.1 presents an overview of the thesis.
Table 1.1: Overview of the thesis

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<th>CASE-STUDY</th>
<th>BIOENERGY POLICY</th>
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<td>National level EPI</td>
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<td>Sub-national level EPI</td>
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Focus of the appended papers

Below, the focus (but not the results, as these will provide the basis for discussion in the final chapter) of the four appended papers are briefly presented (see also Figure 1). Together, the four papers complement each other, as they provide a holistic picture of the development and framing of bioenergy across three political/administrative levels, over time, and within two sectors (energy and agriculture). Collectively, the four appended papers form a genuine basis for fulfilling the aim of the thesis.

Paper I addresses the role of intersectoral policy coordination for outcomes from EPI in multi-sector issues through a case study of EPI in Swedish bioenergy policy over time (1975-2005), where energy forest cultivation on agricultural land is used as an example. Employing thematic idea analysis, the paper explores and compares the framing of (agricultural) bioenergy production over time in order to determine to what extent EPI has taken place in Swedish bioenergy policies, especially in energy forest policies, in the energy sector and in the agricultural sector respectively. Furthermore, through the analysis of whether or not the two policy areas display mutual policy goals and efforts to reach these goals and whether this (lack of) coordination correspond to changes in energy forest cultivation patterns, the paper explores how intersectoral policy coordination is related to the outcomes of EPI in multi-sector issues.
**Paper II** draws on the results of Paper I when analysing the Swedish bioenergy policy process as a positive case of multi-sector EPI. Five hypotheses regarding institutional factors (open actor access to policymaking; use of environment-related knowledge; use of monitoring mechanisms; environmental-sectoral/inter-sectoral coordination mechanisms) and external events (international and national events outside the policy sectors) which seem relevant for multi-sector EPI are developed. Using these hypotheses as a starting point, the developments in the Swedish bioenergy policy process are examined in two policy sectors (energy and agriculture) over four policy rounds (1989-2009). Based on textual analysis of relevant policy documents such as governmental bills and official reports and a set of semi-structured interviews, the article explores which institutional factors seem relevant for multi-sector EPI, and its outcomes. General outcomes are illustrated by developments in Swedish bioenergy production and the specific impact of bioenergy policy on agricultural production is illustrated by energy forest and energy crop cultivation patterns.

**Paper III** focuses on the EU-level, as it explores and compares the EU energy policy and EU agricultural policy with regard to bioenergy and EPI over time. Employing thematic textual analysis of EU bioenergy policy documents combined with a set of semi-structured interviews with key bioenergy actors, the article explores the framing of bioenergy within two sectors over two policy rounds (1995-2009) in order to analyse three questions. The first question addressed is: is there EPI in EU bioenergy policy? This is traced through determining whether environmental framing is present in policy rhetoric, followed by environmental framing in the motivations for policy measures. The second question addressed is: is EU bioenergy policy coherent across sectors? This is answered by comparing bioenergy framing across the two sectors. The third question addressed is: to what extent has EPI occurred in EU bioenergy policy? This question is answered by means of an analysis of what kind of environmental issues are integrated, and whether the environment is prioritised or merely placed side-by-side with other issues.

**Paper IV** focuses on bioenergy on the sub-national level, illustrated by the case of the Biofuel Region, which is an organisation focusing on developing a new renewable fuels-industry based on raw materials from forest, field and recycling sources. The Biofuel Region is located mainly in two north-Swedish counties: Västerbotten and Västernorrland, although the organisation has expanded geographically over the years. Using text analysis of the Biofuel Region documents from 2002-2010, combined with a set of semi-structured interviews with key actors, the paper explores the framing of bioenergy at a sub-national level. The overarching question addressed in the paper is: What are the sub-national implications of higher-level EPI in a policy area? Two
sub-questions are also explored. First, how is bioenergy framed by bioenergy actors in a sub-national Swedish setting? Second, can sub-national bioenergy development be explained by cross-level learning?
Chapter two: Setting the scene

EPI – the setting (or, a brief glance at previous research on EPI, and the policies guiding it)

The growth in academic interest in EPI during the last twenty years or so, has meant that there is now a considerable amount of research on the subject. As Jordan and Lenschow (2010), remark: “Those looking for a detailed assessment of what has – or has not – been achieved with respect to EPI can now consult a growing corpus of academic papers and no less than three edited books” (p. 148). At the time of writing, a fourth edited volume on EPI has recently been published. The first of the three edited books on EPI is Lenschow, 2002, which contains both an in-depth historical exploration of the legal framework for EPI, three national case studies on overarching EPI strategies in the UK, Germany and Italy and three case studies on EPI within EU sector policy (agriculture, transport, energy). The second is Nilsson and Eckerberg, 2007, which explores EPI in Swedish energy and agricultural policy; and the third is Jordan and Lenschow, 2008, which contains a thorough overview of implementing instruments for EPI, and case studies on EPI experiences and prospects on the EU-level and on national level (the book includes six national case studies). The fourth edited book is Goria et al (2010), which explores EPI research on the supranational, national and regional/local level. The case studies in these edited volumes, as well as most other EPI research articles/working papers (a few examples are: Feindt, 2010; Nilsson, 2005; Hertin and Berkhout 2003; Underdal 1980), mainly concentrate on investigating how the concept of “environment” is interpreted and implemented within only one single policy sector1. However; this single-sector focus is an oversimplification. The political world does not consist of self-contained policy sectors, without any overlapping areas. Rather, many of our most pressing issues of concern are complex ones which, if they are to be solved, require the simultaneous attention of politicians in many different sectors. The World Commission on Environment and Development, led by Gro Harlem Brundtland, had already recognised this interdependence, and the need to remedy the institutional fragmentation already by 1987. Nevertheless, twenty-three years down the line, EPI researchers still seem to be locked in within virtual sector ‘walls’, ignoring the interdependent nature of many environmental policy problems. This lack of multi-sectoral attention is a flaw in current EPI research which this thesis will attempt to start amending.

1 There is a body of research on horizontal EPI (HEPI), which concentrates on central, cross-sectoral strategies for EPI, and thus do not answer to the lack of research on EPI in multi-sector issues. See Chapter 2.
When scrutinising previous EPI research, it becomes clear that other aspects of EPI also deserve further attention. Within the European Union, the sector policies likely to be affected by the EPI objective stretch from the supranational level to the national level and down to the sub-national level. Nevertheless, most EPI studies choose to focus on either the EU-level (e.g. Feindt, 2010; Lenschow, 2002; EEA, 2005b; Jordan, 2002; Weale and Williams, 1993) or on the national level (e.g. Lafferty and Hovden, 2003; Nilsson, 2005; Nilsson and Eckerberg, 2007; Jordan and Lenschow, 2008); or on the interaction between EU and national level policies (see Nykvist, 2008, for an overview). The exception is Goria et al (2010), who adopt a multi-level perspective – but the book focuses mainly on mapping out current EPI research with an overarching perspective on EPI at different levels; it does not follow EPI in a case study spanning across levels.

However, as Lafferty and Narodoslawsky (2003, p. 313) point out in their study on regional sustainable development in Europe, “Sectoral integration could be more likely achieved at the lower levels where actual policy implementation takes place, primarily at the regional and local levels”. However, the sub-national policy making arena, as well as the interplay between the three different policy levels (EU, national, sub-national) in specific policy areas, are still virtually ‘black areas’ within our understanding of EPI. This thesis will therefore attempt to contribute to the development of a multilevel perspective in EPI studies.

Below, I provide a background to the policy development of EPI within the UN and the EU, before moving on to the first background account of the setting of the bioenergy case and why it is expected to contribute to the two abovementioned objectives. Note, however, that the research design is further elaborated in Chapter four.

**Policy development of EPI within the UN and the EU**

Environmental issues have been on the international agenda since the conservation movement arose in the early 20th century. However, they were first discussed within the UN in the early 1970s. The first United Nations Conference on the Human Environment (UNCHE), held in Stockholm in 1972 recognised the human responsibility to take the environment into consideration and the need to preserve natural resources for present and future generations. Principle 2 states:

*The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate (UNCHE declaration, 1972, principle 2).*

Fifteen years later, the Brundtland Commission’s *Our common future* (WCED, 1987) came to the conclusion that:
The integrated and interdependent nature of the new challenges and issues today contrasts sharply with the nature of the institutions that exist today. These institutions tend to be independent, fragmented, and working to relatively narrow mandates with closed decision processes. Those responsible for managing natural resources and protecting the environment are institutionally separated from those responsible for managing the economy. The real world of interlocked economic and ecological systems will not change; the policies and institutions must (WCED, 1987, p. 310).

To amend this institutional flaw, the EPI principle was formulated as follows:

*Sustainable development objectives should be incorporated in the terms of reference of those cabinet and legislative committees dealing with national economic policy and planning as well as those dealing with key sector and international policies (WCED, 1987, p. 314).*

As a result, the EPI principle was included under Article 8 in Agenda 21, which was the outcome of the 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro. The Brundtland Commission also formulated the definition of *sustainable development* as: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.43). The Commission emphasised that ‘needs’ referred to the essential needs of the world’s poor, who were to be given overriding priority. The whole concept of sustainable development was based on the idea that there are limitations to the environment’s ability to meet both present and future needs, and that these limitations are affected by the state of technology and social organisation. The concept of sustainable development is the foundation and the goal of environmental policy integration, which, after the Rio Declaration, has become increasingly explicit in international and European policy.

Within the EU, Lafferty and Hovden (2003) argue that the first Environmental Action Plan (EAP) in 1973 “introduces a more holistic approach to environmental problems, where non-environmental policy areas need to consider environmental effects” (p.3). A similar approach is visible in the second EAP, but environmental integration was first brought to political attention within the EU under the third EAP in 1983. It gained legal status within the EU with the Single European Act (ratified in 1987), when it was included under the “Environment Article”; Article 130r. According to Hey (2005), 1987 is therefore often viewed as a turning point in EU environmental policy, when the fourth EAP also presented a more integrated approach to environmental policy and turned more attention to the sectoral environmental impacts. Thus, in essence, we can speak about a European environmental policy from 1987 and onwards. EPI has been at the forefront
of the European Union’s policy agenda especially since it was included in Article 6 of the Amsterdam Treaty in 1997:

Environmental protection requirements must be integrated into the definition and implementation of the Community policies [...] in particular with a view to promoting sustainable development (Article 6 of the European Treaty, OJ, 2002).

Today, EPI is included under Article 6.1 of the Lisbon Treaty, within Article 37 of the Charter of Fundamental Rights of the EU. Under the heading Environmental protection, Article 37 reads:

A high level of environmental protection and the improvement of the quality of the environment must be integrated into the policies of the Union and ensured in accordance with the principle of sustainable development (OJ, 2007, p. 10).

Evaluations of EPI in Europe show that after more than a decade with EPI as a key principle within EU Treaties, the results so far are mixed. Even though some policy sectors and/or some Member States have succeeded ‘better’ (depending on how EPI is measured) than others, there is still a very long way to go before EPI is a natural part of European policy making processes, on all levels and in all sectors (EEA, 2005a).

Bioenergy policy – the setting (or, a brief glance at why bioenergy is a relevant case for this thesis)

One kilowatthour (KwH) is consumed in six hours by the average EU citizen; creates around 420 g of CO₂ (with the current EU energy mix); is produced by a big wind power plant in one second during a strong breeze (ENER-EMOS, 2010, p. 7)

During the last decades, concepts such as climate change, greenhouse gas emissions and sustainability have entered the global political vocabulary. At the same time the global interest in renewable energy sources, with their CO₂-reductive potential and their potential for domestic supply-security (since it reduces energy import dependence) has increased significantly. Within the EU, renewable energy sources currently provide 9.17% of the gross final energy consumption. Bioenergy is undoubtedly the leading renewable energy source (RES) in the EU-27, as it constituted 69.8% of the renewable energy consumed within in the European Union in 2007 (ENER-EMOS, 2010). Furthermore, the European Commission has recognised that a significant increase in biomass use is required for achieving the goal in the Renewable Energy Directive (RED), aiming for 20% renewable energy in gross final energy consumption by 2020 (EC, 2005a, 2006c, EEA, 2006; EP and C, 2009). The increasing interest in renewable energy might also be illustrated by looking at the indigenous energy production within the EU,
where renewable energy increased by 8.3% in one year (2006-2007) and accounted for 16.2% of the EU energy production in 2007, which meant that RES for the first time accounted for a larger share of Europe’s energy production than oil (14.2%). Currently, however, even though renewable energy sources gradually have become more important, the share of RES varies significantly within the EU (ENER-EMOS, 2010).

**Figure 2.1: Gross final energy consumption**

<table>
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<tbody>
<tr>
<td><strong>Renewables</strong> 7.8%</td>
<td><strong>Oil</strong> 36.4%</td>
</tr>
<tr>
<td><strong>Other</strong> 0.2%</td>
<td><strong>Pumped storage</strong> 0.9%</td>
</tr>
<tr>
<td><strong>Solid fuels</strong> 18.3%</td>
<td><strong>Biofuels</strong> 31.7%</td>
</tr>
<tr>
<td><strong>Nuclear</strong> 13.4%</td>
<td><strong>Gas</strong> 2.9%</td>
</tr>
<tr>
<td><strong>Wind</strong> 0.7%</td>
<td><strong>Hydro</strong> 16.9%</td>
</tr>
<tr>
<td><strong>Coal</strong> 3.3%</td>
<td><strong>Nuclear</strong> 12.9%</td>
</tr>
<tr>
<td><strong>Pump storage</strong> 0.9%</td>
<td><strong>Oil</strong> 30.8%</td>
</tr>
<tr>
<td><strong>Gas</strong> 23.9%</td>
<td><strong>Solid fuels 18.3%</strong></td>
</tr>
<tr>
<td><strong>Nuclear</strong> 13.4%</td>
<td><strong>Other</strong> 0.2%</td>
</tr>
</tbody>
</table>

(Source: ENER-EMOS, 2010; SEA and SCB, 2010)

In Sweden, bioenergy provided more energy than oil in 2009, as biomass-based energy sources (including peat and waste) constituted 115.6 TWh, or 31.7% of the final energy consumption in 2009, while oil-based energy sources constituted 30.8% (waterpower constituted 16.9%, nuclear power 12.9%, coal 3.3%, natural gas 2.9% and wind power 0.7%). Thus, biomass-based energy sources were the largest contributor to the Swedish energy supply in 2009 (Svebio, 2010; SEA 2010). This comparison between EU and Sweden is, however, a bit skewed, since peat (which stands for a very small share of bioenergy in Sweden: 3.9 TWh, or 0.7% of the total Swedish energy supply in 2009, c.f. SEA and SCB, 2010) is included within “biofuels” in the Swedish statistics, even though it is not defined as a renewable energy source within the EU:

*From a greenhouse gas point of view, peat is not an advantage because the point of renewable energy is that the plants take away the CO2 which is released when it is burnt. Peat doesn’t do that. Anyway, the classification of peat as a renewable energy*
or not, that is based on the IPCC-classification and we are not going to change it (Interview, Commission Official, 2008).

The peat example illustrates an inherent problem when assessing the environmental aspects in EPI, namely the different types of environmental values which lead to contested interpretations of how EPI may be achieved.

**Delimiting the case study**

As shown above, bioenergy is an energy source of increasing importance within the EU (and in Sweden). However, as both the production of biomass and bioenergy and the policy decisions providing the political framework for such production take place in diverse policy sectors, bioenergy policy creation depends on policymaking in different policy areas (including energy, agriculture, waste, forestry and environment). This makes bioenergy a *multi-sector policy area*. In this thesis, focus lies on comparing the energy sector and the agricultural sector in terms of bioenergy policy. The main reasons behind this choice are that a great majority of biomass within the EU is currently provided by the agricultural sector; and that this sector, via the Common Agricultural Policy (CAP), is more highly subject to EU control than, for example, forest or waste policies which are more nationally controlled (see Paper III). This leads on to another aspect of bioenergy to consider, namely the fact that this is a policy area which is signified by its dependency on a global market and European regulations which are to be implemented on EU, national and sub-national levels. Thus, bioenergy is also a *multi-level policy area*. In addition, bioenergy is characterised by the involvement of strong economic interests (including energy producers and pulp-and-paper industry) and other lobby groups (such as environmental and agricultural organizations), which means that the policy area is characterised by vested interests. This contributes to bioenergy being a *contested policy area*, where it is highly relevant to explore the existence/non-existence of potential conflicting views regarding different interpretations of the role of bioenergy and of the ‘E’ in EPI within bioenergy, especially within different sectors and on different political levels. Thus, bioenergy can be described as (1) a multi-sector policy area; (2) a multi-level policy area influenced by international events; and (3) a contested policy area, which is a battle ground for strong actors and characterised by multiple interpretations of the ‘E’ of EPI. These multi-sector, multi-level and contested policy area characteristics make bioenergy a relevant case for fulfilling the aim of this thesis, since it adds new aspects to and increases the complexity of the EPI-discussion. The characteristics of bioenergy are further discussed below, where the parts of bioenergy policy which are focused upon in the thesis are also specified.
Bioenergy – a multi-sector case

As previously mentioned, bioenergy refers to all different types of energy (both electricity and fuels for transport) generated from biofuels, which are derived from biomass. The term biofuels can be divided into three main groups, depending on the type of biomass utilised: 1) by-products from forestry and agriculture; 2) municipal and industrial waste streams; and 3) field fuels, or dedicated energy crop cultivation (see e.g. Vattenfall, 2001).

This means that bioenergy is situated in-between energy, agriculture, forest, waste and environmental policy and this involvement of different sectors makes bioenergy a multi-sector policy area where both the framing of bioenergy and the policy outcomes are coloured by the frames of reference – and are dependent on the measures undertaken – in different policy areas. In this thesis, I focus on bioenergy as a crop (field fuels) mainly because this is the dominant form of bioenergy within the EU and because of the opportunities for EU central steering of production provided by CAP. Thus, attention is placed on exploring and comparing environmental policy integration in bioenergy policy within two policy sectors – energy and agriculture. While renewable energy policy (including bioenergy) is mainly discussed within the energy sector, the consumption of fossil and nuclear energy in agricultural production is considerable (Engström, 2007) and current agricultural practices contribute to greenhouse gas emissions (EEA, 2006). It is often neglected that changes in agricultural production could partly address environmental problems caused by an unsustainable dependence on fossil and nuclear energy in the agricultural sector, as well as in society as a whole. There are three main reasons why the agricultural sector should pay greater attention to energy issues: firstly, as a user of energy; secondly, as a potential producer of biomass for bioenergy (mainly field fuels such as energy forest, energy grass, rape and straw); and thirdly, because of its dependence on a healthy environment for its survival. According to EEA (2006) and SJV (2009), cultivation of especially perennial bioenergy crops (e.g. energy forest and energy grass) can improve the environment, especially if planted in optimal locations: short rotation forest is carbon dioxide neutral, the plantations can be used in reducing nitrogen and cadmium leakage and energy crops can be grown on currently fallow land. However, there are also conflicting views and multi-level aspects related to bioenergy production which need to be considered, as will be further discussed below.

Bioenergy – a multi-level case

The multi-level perspective on EPI is of particular importance in a Swedish national and sub-national policy context following Sweden’s entry into the EU in 1995. This introduced both a new political level influencing Swedish policy and strengthened the role of the regional level. The EU’s influence is
especially important within the agricultural sector, where the Common Agricultural Policy (CAP) has significant implications for the Member States’ room to manoeuvre. Since EPI in bioenergy is thus influenced by European policy as well as the implementation on a national and sub-national level, this thesis takes a multi-level perspective on EPI, examining the environmental policy integration process on three levels: EU, national and sub-national. Focus lies on exploring and comparing EPI in European bioenergy policy; in Swedish bioenergy policy; and in sub-national bioenergy policy, where the Biofuel Region (BFR) in Västerbotten/Västernorrland is studied in depth. The reasons for focusing on the Swedish national and sub-national level will be further discussed in the methodological chapter, but the main reason is Sweden’s reputation as an environmental forerunner within the EU and because the Biofuel Region is a pioneering region in terms of biofuel production within Europe. Therefore, Sweden and the Biofuel Region represent crucial ‘most-likely’ cases for EPI – if EPI does not happen under such circumstances – where is it supposed to happen? The characteristics of Sweden and BFR, which make bioenergy development on these levels relevant to explore in this theses will be further discussed in the methodological chapter. However, it is worth mentioning here that it is of particular relevance to investigate whether the Biofuel Region could be seen as an example of sub-national implementation of EPI, and how the local level interacts with the national and European policy levels (that is, EPI as multi-level governance, see Chapter three).

Bioenergy – a contested, “multi-E”, case
When being asked whether environmental issues are a natural element in bioenergy discussions, and whether that had changed over time, one interviewee representing the Swedish Energy Agency stated that: “environment is what bioenergy is all about” (Interview, SEA5, 2005). What this interviewee wanted to indicate was that bioenergy policy had always been related to environmental issues. This reflection by one of the actors involved in bioenergy policy creation is quite interesting, considering that when looking at the development of bioenergy policy over the last thirty years or so, the outlook is in essence pointing in a different and somewhat less black-and-white direction (Paper I). Bioenergy has, in fact, been promoted in Sweden (and within the EU) for many different reasons of which environmental concern, albeit important, is only one. Further, what is meant by environmental concern has also varied over time. Thus, the role of environmental issues within bioenergy policy is complex. On the one hand, bioenergy is promoted because of potential environmental benefits such as (mainly) decreased greenhouse gas-emissions. On the other, there are also potentially negative environmental and social consequences which could result from large-scale bioenergy production and use, such as fears for
biodiversity loss; air pollution; eutrophication; food scarcity; land-use conflicts; increased emissions of greenhouse gases etc. (e.g. SwedWatch, 2009; IEEP, 2010; Giampietro and Mayumi, 2009). These possible consequences are directly related to the question of justice, both with regard to the relationship between the human world and nature; and to what extent the ‘rich’ north can use land in the ‘poor’ south for solving their fuel shortage (with the potential consequences of increased poverty and food shortage in the south). Therefore, questions of justice and environmental consequences also need to be taken into account in the discussion of the sustainability of bioenergy. Further, the scientific community has not reached a consensus regarding the potential environmental benefits/consequences from bioenergy production and use in different parts of the world, which increases the complexity of the ‘E’ within bioenergy. I return to the relationship between the concept of justice and EPI in Chapter 3, and continue the discussion regarding whether these consequences have been considered, over time, within Swedish and EU bioenergy policy in the final Chapter (based on Paper I, III, IV). For now, it is however sufficient to recognise that (as indicated by “multi-E” in the heading above) ‘environment’ in relation to bioenergy is a multi-faceted concept. The interpretations of the role of environment within bioenergy policy, and also the role of bioenergy in general may differ between different policy levels. Sweden and Finland, for example, have large-scale forest assets which can be used for bioenergy production (accompanied by forest-related environmental concerns), while the EU as a whole has an interest in using the agricultural surplus for bioenergy production (associated with agricultural-related environmental concerns). There are also other arguments for bioenergy increase, which may differ between policy levels. At the EU-level, the concerns for increased supply-security may seem highly relevant for bioenergy decisions (Paper III); while on the sub-national level, local politicians may place more relevance upon local job generation than on decreased CO₂-emissions when deciding upon bioenergy production (Paper IV). Thus, bioenergy is related to different environmental problems and different policy problems in different regions of the world as well as on different levels and in different sectors. These differences between different levels and sectors, and how they interact, are therefore relevant to explore in order to get the full picture of EPI in bioenergy policy.

Bioenergy – a case of relevance also in a broader context
Apart from the multi-sector, multi-level, and contested policy area characteristics – why is bioenergy policy relevant to study from an EPI and political science perspective? There are three main other reasons for focusing on bioenergy. First of all, it is empirically relevant, as bioenergy has not previously been explored from a political science perspective – and
particularly not within the field of EPI research. Secondly, we are living in a world where resource supplies are finite (Meadows et al, 1972; 2004). Therefore, moving from non-renewable energy sources, such as fossil and nuclear energy, to renewable energy sources, such as wind, water, solar power or bioenergy, can be seen as a feasible step on the way towards reducing the ecological footprint (Wackernagel and Rees, 1996) of the world’s human inhabitants. However, to ensure sustainability, and to maximise the reduction of the ecological footprint, it is important that renewable energy decision makers are aware of different environmental aspects of the available renewable energy sources, and provided with evidence/data that may be take into account in their policy decisions. Here, as pointed out above, not only the potential reduction of CO$_2$-emissions is relevant; but also different types of environmental consequences and benefits which stem from renewable energy production and use need to be taken into account. Given the close relation between renewable energy and the environmental movement’s concern with the limited earthly resources, environmental policy integration should, if anywhere, have a place in this policy area. This makes renewable energy sources in general – including bioenergy – crucial ‘most-likely’ (e.g. Eckstein, 1975) cases for EPI. If environmental policy integration does not happen within renewable energy policy – where will it happen? Thirdly, the study of EPI in bioenergy policy is also of relevance in a wider context, since the multi-sector, multi-level characteristics of the policy area are not unique. Three closely related examples of this are transport, food and climate policies, but even gender and health policies also share similar characteristics (e.g. Östlin et al, 2006). Furthermore, the process of EPI is closely correlated to other types of mainstreaming, where endeavours are being made to include different issues in day-to-day policies in all sectors of society. The mainstreaming concept is often used in relation to the accomplishment of gender equality through “gender mainstreaming” (Daly, 2005), but also corresponds to other kinds of issues, such as disability policy or human rights mainstreaming. Consequently the conclusions of this thesis may be applicable to other policy areas and political challenges that share similar characteristics regarding multisectorality and mainstreaming (across levels).

The aforementioned characteristics make bioenergy a relevant case for both addressing EPI specifically and the issue of mainstreaming within policy in general. It adds further complexity to EPI research, which provides insights into multi-level, multi-sector EPI. The research design is further motivated in Chapter four. Next, however, we move on to the analytical framework of the thesis.
Chapter three: Analytical framework

Perspectives on environmental policy integration

Through the Single European Act (1986) and the Maastricht (1992), Amsterdam (1997) and Nice treaties (2000), there is probably no single government or other association of states with such a strong 'constitutional' commitment to sustainable development as the EU. Sustainable development is now a norm of EU politics, both domestically and internationally (Baker, 2006, page 136).

Environmental issues are, inherently, complex and cross-cutting, which nevertheless need to be handled within the highly fragmented and sectorised political system. There exists a long line of research regarding ways to cope with such complex issues. Already in 1974, Warren et al. proposed concerted decision-making as one solution. Other researchers suggest policy coordination (Challis et al. 1988; Peters, 1998); joined up policy or government (Wilkinson and Applebee, 1999; Ling, 2002); or network management (Kickert et al. 1997). However, the concept closest to environmental policy integration (EPI) is policy integration (PI), which Underdal (1980), in his exploration of marine policy, defines as when “all significant consequences of policy decisions are recognised as decision premises, where policy options are evaluated on the basis of their effects on some aggregate measure of utility, and where the different policy elements are in accord with each other” (p. 162). Meijers and Stead (2004) define PI, or integrated policymaking, as “the management of cross-cutting issues in policymaking” and “the management of policy responsibility within a single organisation or sector” aiming to achieve “one joint policy for the sectors involved” (p. 2-5). So, what can EPI learn from PI?

In a much-cited paper on EPI, Persson (2004) reviews both the PI and policy coordination literature, as well as the EPI literature and concludes that “the usefulness of lessons from general policy integration is questionable since they picture the integration problem as one of integrating existing parts into a new whole, either through an improved decision-making process or new administrative arrangements”. Whereas the EPI literature, “suggests that the integration challenge consists of integrating one type of concern (environmental) into already existing sets of sector concerns and related policy processes, organisational arrangements and power structures” (Persson, 2004, p. 20). Thus, PI and EPI tend to address different aspects. In a multi-sectoral issue such as bioenergy policy, policy coordination between policy sectors is certainly of relevance, and the role of policy coordination for multi-sector EPI is addressed here within the scope of Papers I and II. It is, however, important to point out that it is possible to coordinate policy without achieving EPI – although the goal of policy coordination is policy
coherence, environmental policy integration requires attention to the specific integration of one policy concern (the environment) into sector policy. According to Jordan and Lenschow (2008, 2010), three main analytical dimensions of EPI exist: 1) an institutional perspective, focusing on EPI as a policy coordination problem; 2) a political perspective, focusing on EPI as a problem of political conflict and lobbying; and 3) a cognitive perspective, focusing on different actor interests, how they are embedded within ideational frames, and how cognitive learning occurs (see also Paper III). Thus, while policy integration focuses to a large extent on the policy process, which is also relevant within an institutional or political perspective on environmental policy integration; EPI may, in addition, pay attention to the integration of environmental issues into sector concerns, or, put differently, into sector policy. EPI, in the sense it is applied within this thesis, focuses largely on a cognitive dimension of EPI – the development of environmental issues within policy through analysing policy frames over time, even though elements of the institutional and political perspectives on EPI are also discussed in the empirical analysis.

To integrate environmental policy into other sectors – environmental policy integration – is, according to Baker and Eckerberg (2008, p. 6) “a core feature of both ecological modernisation strategies and those directed at the promotion of sustainable development”. This quote sheds light on the fact that there are different ways of viewing EPI, and that there is a difference between ecological modernisation (the decoupling of economic growth from environmental destruction through a green technological innovation or shift to more environmentally friendly products, see e.g. Baker, 2006, page 137) and sustainable development (development which is economically, socially and ecologically sustainable, ensuring for both present and future human generations the possibility to satisfy their needs, see WCED, 1987, page 43), which we need to understand in order to fully comprehend the different, and sometimes contested, views on EPI. In this section, I will therefore further discuss those perspectives on EPI which are relevant for the scope of the thesis. What is a multi-sector perspective on EPI? How can EPI be regarded from the point of view of multi-level governance? What does the “E” in EPI stand for? What is the relation between EPI and sustainable development? What does the “I” in EPI stand for – how can EPI be ‘measured’; is weak EPI, where the environment is taken in alongside other priorities, enough, or does the environment need to be prioritised, as in strong EPI? Furthermore, the cognitive perspective on EPI as learning taken on in this thesis is discussed here, before moving on to the institutional/political perspectives.
A multi-sector perspective on EPI

Issues that concern two or more sectors can be classified as multi-sectoral issues, and – aside from bioenergy – transport, food, health and climate policies are examples of such issues. Even though many political challenges and, in particular, the current environmental challenges are impacted by decisions in many different sectors, the issue of multi-sector EPI is largely unexplored. In many ways, multi-sector EPI is on the one hand a matter of active policy coordination (Paper I). On the other hand, the goal of the coordination process is policy coherence, which is of great relevance for the outcome of EPI-processes (independently of whether or not the policy coherence is the result of active coordinating procedures or of a coincidence) (see Paper III). This relationship between policy coordination and policy coherence is apparent in Challis et al (1988), in which policy coordination is defined as “a pursuit of coherence, consistency, comprehensiveness and of harmonious or compatible outcomes” (page 25, emphasis added). The need for cross-sectoral policy coordination for EPI has been pointed out by several other EPI researchers, but this is mainly in reference to the need for central governmental EPI strategies. EPI studies generally concentrate on exploring either vertical EPI (VEPI) or horizontal EPI (HEPI). Vertical EPI indicates “the extent to which a particular governmental sector has adopted and sought to implant environmental objectives as central in the portfolio of objectives that the governmental body continuously pursues” (Lafferty and Hovden, 2003, p. 12), and thus refers to the integration of environment in one particular sector (Lafferty and Hovden 2003, Lafferty et al. 2004a). Horizontal EPI (HEPI), on the other hand, indicates a “comprehensive cross-sectoral strategy for EPI” developed by a central authority (Lafferty et al. 2004b, p. 17). In multi-sector EPI, focus lies on exploring the coherence between policies on a certain issue in different relevant sectors (Paper I, III).

A multi-level governance perspective on EPI

Relative to some other policy areas, such as social policy, environmental policy has strong multi-level characteristics (Homeyer and Knoblauch, 2008).

How multi-level governance (MLG) should be defined is a fluid discussion, and the concept is also used for different purposes (e.g. Eckerberg and Joas 2004). Some use MLG to explain the role of the EU in multi-level decision making, while others use it to illustrate the development towards network governance (see Hooghe and Marks, 2003; Bache and Flinders, 2004). The concept is also commonly used to illustrate the complexity of decision making; especially regarding environmental problems, which often span across territorial boundaries (e.g. Homeyer and Knoblauch, 2008). Thus,
MLG is a useful concept in the illustration of the complexity of society in general and, in particular, the complexity of environmental problems. With regard to the definition of MLG, a useful input is provided by Bache and Flinders (2004, p. 197), who combine different contributions on a common theme to derive four common understandings of the concept. They conclude that MLG refers to: increased participation in policy making by non-state actors; that distinct decision making levels are becoming more difficult to discern; a new role of the state in this new environment; and a new decision making context which makes it necessary to rethink democratic accountability. In this context, according to Oberthür and Gehring (2006), the effectiveness of environmental governance instruments, such as international regimes or different EU environmental instruments, are affected by inter-institutional influence from other regimes/policy instruments. Given the rich density (>200) of instruments in the field of European environmental policy, in combination with the density of instruments at the national level, it is reasonable to assume that European policy measures intended to promote EPI or measures taken to realise environmentally driven policy goals may clash with national measures, or with policy measures taken in other policy sectors.

According to Hooghe and Marks (2003), there are two main types of MLG. Type I MLG can be found from the sub-national regional level to the national level and is similar to federative systems, characterised by general-purpose jurisdictions, non-intersecting memberships, jurisdictions at a limited number of levels and system-wide architecture. In Type II MLG, which can be found at all levels from the sub-national local/regional level to the supranational level, the jurisdictions are task-specific, memberships are intersecting, the number of jurisdictional levels is unlimited and the design is flexible. Marks and Hooghe characterises the EU as Type I.

There are only a few studies on multi-level governance and EPI. Homeyer and Knoblauch (2008) analyse how different modes of governance on different political levels affect EPI, and conclude that “both hierarchical and communicative governance at the EU-level have the potential of promoting the concept of EPI at the level of the Member States” (p. 11). Nykvist (2008) provides an overview of how MLG has been addressed within EPI literature, and concludes that most studies point to the continued importance of the nation-state, and that EPI usually refers to integration at a specific level:

A key discussion in the literature is therefore also the role of MLG in terms of the bypassing of the nation states, or rather, new type of pressures for actions, since most authors agree that the final decision making power chiefly remains at the nation state. Fewer, if any, studies actually refer to MLG and EPI by employing assessments of EPI simultaneously at different levels (Nykvist, 2008, p. 18).
Lenschow (2002) refers to the EU as a multi-level polity, where vertical lines of contact between the EU and Member States are important for learning and reform, but does not address the multi-level governance concept as such. Goria et al (2010) address EPI on different political/administrative levels, but do not explicitly make use of the MLG-concept. Since the implementation of bioenergy policy goals within the EU, in line with Lenschow’s (2002) reference to a multi-level polity, depends on a multi-level governance (MLG) system, an analysis of EPI in bioenergy policy needs to take the multi-level character of the decision making arena into account. The concept of multi-level governance is used here to analyse policies made on different levels and to recognise that different types of actors are relevant within this process. To this end, the relation between European bioenergy policy and Swedish bioenergy policy on the national and sub-national level is discussed in this thesis in order to explore whether EPI is different on different levels and whether efforts to promote EPI at EU level influence efforts to promote EPI at the national level (and below). However, a central hypothesis in multi-level governance theory is the presumption that in a multi-level system, more direct links between the sub-national level and the supra-national level will occur through networks and therefore the national level will be more frequently circumvented; a process sometimes described as a ‘hollowing-out’ of the state (Rhodes, 2000). Other researchers, for example Eckerberg and Joas (2004), however claim that the national level is still highly relevant for the policymaking conditions at the local level. Therefore, when exploring EPI across levels it is also relevant to study the interaction between the regional, national and European levels in terms of cross-scale links and conception of reality. What role does the EU play in sub-national actions in terms of bioenergy and EPI, and is bioenergy policy a case of hollowing-out of the state?

As clarified in the aim, the thesis discusses to what extent the EU’s framing of bioenergy is parallel to the Swedish (national and sub-national) framing of the issue; if this has changed over time (and – if so – how); and, in what way this frame compliance/frame clash shape the prospects to promote EPI in Swedish bioenergy policy and on the sub-national level. Therefore, the analysis here mainly focuses on the multi-level part of the multi-level governance concept; that there are different levels of decision making which interact with each other. Through comparing policies at the three different levels (EU and Swedish national/sub-national) the implications of EU bioenergy policies for the promotion of EPI in Swedish bioenergy policy are explored. However, the MLG concept also contains a governance element, which emphasises the role of non-state actors in policymaking, and thus questions the intergovernmentalist view of EU decision-making, as driven by national, member state interests (Marsh and Furlong, 2002). Multi-level governance theorists see policymaking as a
process involving the often non-hierarchical “interaction between a constellation of public and private actors” (Hunt 1999, cited in Marsh and Furlong, 2002, p. 36) at different levels. Such a development in policymaking, whereby top-down steering is not the only way to make policy; but where actors at many different levels have an impact on the policy process, have also been addressed by many other researchers (e.g. Nakamura, 1987; Sabatier & Jenkins-Smith 1993; deLeon 1999; Carlsson, 2000). In this thesis, focus is on exploring the ‘if’ of EPI (is there EPI?) and the multi-level interaction between different policies as expressed in policy documents produced on different levels. Nevertheless, the ‘how’ (or the governance part) of multi-level EPI is also addressed in the interviews with actors on all levels; explored in-depth on the national level in Paper II; considered in Papers III and IV; and discussed also in the final Chapter. The scope of the multi-level analysis is, however, limited to comparison between policy documents and interview statements at different levels in order to detect policy learning across levels. The way in which policies at different levels influence each other is measured here mainly through the timing of policy change (which change came first – Swedish or European?) and is also addressed in interviews.

The meaning of ‘E’ in relation to the ‘I’: weak and strong EPI

_Government ministers do not suddenly become political ecologists by trading in their limousines for hybrid (electric/petrol) cars (Dobson, 2007, p 3)._  

In order to contextualise environmental policy integration; and to understand both what it means and why the concept is relevant for politicians and political scientists of today, we need to explore EPI’s origin and goal: the concept of sustainable development. As mentioned above, and as recognised by the Club of Rome in their famous book “Limits to growth” (Meadows et al., 1972, 2004; see also Turner, 2008, Dobson, 1990): the earthly resources are limited. This insight has slowly grown stronger in the Western liberal democracies as the effects from industrialisation on the sensitive ecosystem have become apparent. Sustainability finds its roots as early as in eighteenth century philosophy, when thinkers wrote on the risks involved with rapid population growth (Malthus, 1766-1834) and the potential for coal scarcity (Jevons, 1835-1882) (Baker, 2006). The concept of sustainable development, mainly focusing on ecological development, was introduced to the international community by the International Union for the Conservation of Nature and Natural Resources (IUCN 1980). The idea was further specified – advancing that today’s generations should use the Earth’s resources in a way that is economically, socially and ecologically
sustainable and which does not interfere with the conditions for life of future generations – by Brundtland and her colleagues in 1987\(^2\). As described in Chapter two, sustainable development is today guiding environmental policy within the international community – and can be considered the origin and goal of EPI.

To stretch the concept of justice to include justice between generations is not an entirely new idea. For example, in the 17th century, John Locke argued that we have a duty to preserve resources for future human generations in the *Lockean Proviso* (Hansson, 1999). Another example is John Rawls (1971/1999), who claims that if people were to be placed behind a veil of ignorance and asked to write a constitution, the only acceptable solution for them would be a society built on justice between generations to preserve a material base, which allows the realisation of the basic freedoms (the right to life, freedom and ownership) (Rawls, 1999). The libertarian philosopher Robert Nozick (1974/2002), also embraces the Lockean proviso in his *Anarchy, State, and Utopia*, where he promotes the use of a utilitarian\(^3\) utility calculation to regulate the human-nature relationship, and argues that only those polluting activities, “whose benefits are greater than their polluting effects” should be permitted (Nozick, 2002, p. 77, italics in original). While the above-mentioned philosophers hold an anthropocentric, human centred view on the human-nature relationship, there are a number of green philosophers who advocate an ecocentric, nature centred, view of society and nature; implying that plants, animals and landscapes have an intrinsic value, independent of human utility, and that we thus have reasons to preserve nature for its own sake – not for human utility (see e.g. Barry, 1996, Eckersley, 1992; Foreman, 1991; Doherty & de Geus, 1996). Arne Naess (1971/1981), even claims that today’s humans are guilty of *future-imperialism*, when we through our lifestyles intrude on future generations’ prospects of living their lives in freedom. The difference between anthropocentrism and ecocentrism can also be expressed following Dobson (1990/2007), emphasising the difference between *environmentalism*, which:

> argues for a managerial approach to environmental problems, secure in the belief that they can be solved without fundamental changes in present values or patterns of production and consumption (Dobson, 2007, p. 3);

and *ecologism*, which:

---

\(^2\) Although the Brundtland commission did not coin the concept, their report launched it to broader audience (e.g. Adger and Jordan, 2009, page 8).

\(^3\) The goal of utilitarianism is to maximise the utility in society, and therefore the principle of *utility-maximisation* should guide our actions. It is the total utility in society that counts, and therefore utilitarianism for example allows the sacrifice of one individual if this increases the total utility in society (c.f. Kymlicka, 1999).
Environmentalism can thus be likened to “adding environment and stir” into already existing anthropocentric ideologies and systems, sometimes referred to as ecological modernisation (e.g. Baker, 2007), while ecologism represents an ideology of its own, opting for radical change towards an increased level of ecocentrism in both values, systems and lifestyles. This differentiation between anthropocentrism and ecocentrism and different degrees of environmental relevance connotes the discussion within EPI literature regarding weak and strong EPI, as will be further elaborated below.

So: how do we recognise EPI when we see it?
In accordance with the Lisbon Treaty, which entered into force in December 2009, the EU is to “work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment” (Article 3.2). Furthermore, the preamble states that the EU is “to promote economic and social progress for their peoples, taking into account the principle of sustainable development and within the context of the accomplishment of the internal market and of reinforced cohesion and environmental protection, and to implement policies ensuring that advances in economic integration are accompanied by parallel progress in other fields” (OJ 2008, p.15). Taking environmental issues into account in sector policy is thus of high relevance for the EU in order to live up to its commitment to sustainable development, but the environment is not necessarily prioritised. In this section, I will address the fact that, depending on what school of thought we lean on, both the conclusion that EPI indeed has taken place within EU policy – and the conclusion that it has not – are possible to prove from these Lisbon Treaty quotes.

When analysing the European sustainable development work, Baker (2007) argues that the EU’s sustainable development strategy to a large extent has become a matter of ecological modernisation, characterised by the marriage between economic growth and ecological concerns (see also Murphy, 2000; Mol, 2000):

The key strategy [of ecological modernisation] is to achieve eco-efficiency. This perspective regards growth as part of the solution to environmental problems, not as part of the problem (Baker, 2006, page 138).

This quote illustrates the ‘seductive appeal’ (Baker, 2007) of ecological modernisation, which lies in its avoidance of the ecologist claim that...
sustainable development requires substantial lifestyle changes, especially in Western high-consuming societies. According to radical ecologists, the complete abolishment of capitalism is required to enable sustainable development (see e.g. Carter, 2007; Dobson, 2007). Addressing the steadfast ecologist critique of ecological modernisation, Baker concludes that we should not view the development towards ecological modernisation as the ‘end of environmentalism’, rather: “the symbolic commitment to sustainable development has transformational potential” (Baker, 2007, p. 315).

Environmental policy integration can, according to Baker, be viewed both as a component of ecological modernisation and of a sustainable development strategy, but in order to promote sustainable development, EPI requires a prioritisation of the environment (Baker, 2007, p 305). This relates to the fact that some scholars argue that if the environment is considered in sector policymaking, on a par with other issues, such as economic growth, it still “counts” as EPI (e.g. Lenschow, 2002). Other scholars, mainly Lafferty and Hovden (2003, p.20), however, hold that EPI always requires a ‘principled and consequential prioritisation of environmental concerns’; otherwise we are witnessing something other than EPI. These two types of EPI have been labelled ‘weak’ and ‘strong’ EPI (see e.g. Jordan and Shout, 2006), and are related to the discussion above regarding anthropocentrism and ecocentrism. For example in Susan Baker’s (2006, pp. 30-31) ladder of sustainable development, where weak EPI (“integration of environmental concerns at sector level; green planning and design”) is placed within the anthropocentric category; while strong EPI (“principled priority to environment”) is placed within the ecocentric category. Thus, there is a connection between different views of the human - nature relationship and weak and strong EPI. This discussion is also linked to the critique sometimes directed towards the three-tiered sustainable development concept, which inherently implies equal attention to social, economic and ecologically sustainable development (which is closely related to ecological modernisation), and therefore might weaken the ecological aspect of the concept (see Paper III and Jordan et al 2008, p. 172).

Based on the discussion above, it is possible to interpret the ‘E’ either from an anthropocentric worldview, aiming for ecological modernisation/the three-tiered sustainable development concept; or from an ecocentric worldview, aiming for ecologically sustainable development through significant value and lifestyle changes. Similarly, the meaning of ‘I’ can be interpreted either as “adding environment and stir”, i.e. paying consideration to the environment in sector policymaking; or as giving principled and consequential priority to environmental issues. These different understandings of the ‘E’ and the ‘I’ constitute the difference between weak and strong EPI in this thesis. Table 3.1 provides a (very simplified) summary of the links between weak and strong EPI,
anthropocentric versus ecocentric worldviews and ecological modernisation versus sustainable development. Note, however, that in reality, the distinction between weak and strong EPI is not easily made – rather than being distinct dichotomies, the two concepts can be viewed as different endpoints on a sliding scale. Indeed, the environment may be valued differently within different cultures and disciplines. For example, an environmental economics solution – to put a price on environmental destruction – could in a sense be viewed as a way to prioritise the environment (although still with an anthropocentric worldview). Table 3.1 illustrates how weak and strong EPI are conceptualised within this thesis.

### Table 3.1 Weak and Strong EPI

<table>
<thead>
<tr>
<th></th>
<th>‘E’</th>
<th>‘I’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak EPI</td>
<td>Worldview: Anthropocentrism</td>
<td>Environment is considered in sector policymaking</td>
</tr>
<tr>
<td></td>
<td>Goal: Ecological modernisation.</td>
<td></td>
</tr>
<tr>
<td>Strong EPI</td>
<td>Worldview: Ecocentrism</td>
<td>Principled and consequential prioritisation of environmental concerns.</td>
</tr>
<tr>
<td></td>
<td>Goal: Ecologically sustainable development</td>
<td></td>
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</tbody>
</table>

The less rigid, or ‘weak’ definition is applied in Papers I-IV to determine whether or not EPI has taken place. Thus, in line with Lenschow’s (2002) criteria, it is sufficient to count as EPI if the environment is considered in bioenergy policy-making. Please note, however, that in order to count even as ‘weak’ EPI in this thesis environmental considerations need to be visible in both policy rhetoric and practice; this will be further elaborated upon below. Before moving on, it is nevertheless important to note that the ‘E’ of EPI needs further specification: what does ‘environment’ mean in practice?

Here, Persson (2007, p. 28) offers a useful definition:

> In general, the EPI literature refers to the terms environmental or ecological objectives or concerns (if not the overall term ‘policy’) as the ‘objects’ to be integrated in sector policy...they can range from broad and long-term aspirations (for example a sustainable transport system), to quantified and timed targets (for example reducing carbon dioxide emissions by 20 percent by 2020), and finally to specific requirements (for example protecting a certain wilderness area from road construction projects).
When looking for EPI here, ‘environment’ thus stands for the integration of short and long-term environmental objectives such as *environmental aspirations, targets and requirements* in sector policy.

Applying the lens of the weaker form of EPI means that ecological modernisation counts as EPI in this thesis. However, Papers I and III also discuss to what extent EPI has occurred through considering whether the environment is placed on a par with other sectoral issues or given principled priority. This means that the ‘strength’ of EPI, or the prioritisation of environmental issues, is considered within the scope of Papers I and III. In the concluding chapter, the results in terms of strong or weak EPI within EU and Swedish bioenergy policy, and what consequences different forms of EPI have for the role of environment within bioenergy policy, are analysed and discussed in more depth. Further, consideration is given to how to detect EPI in the following section.

**A reframing approach to EPI: who learns, what, when, and how?**

Environmental policy integration is viewed here as a process of *learning*, which can be traced in *reframing* of policy towards environmental attention in both rhetoric and delineated policy strategies. Accordingly, both the concept of learning and the concept of (re)frameing will be discussed in-depth below. One way of describing policymaking is to visualise the process as hierarchical, where decisions are implemented from the top and down in logical steps (Lasswell, 1950). This *stages heuristics* approach has been described by its critics as “the textbook version of policymaking” (Nakamura, 1987), and similar criticisms have been advanced by Sabatier and Jenkins-Smith (1993 and 1999), who argue that this approach tends to overlook the role played by ideas in policy making, and the influence that other actors than politicians have on the procedure (Sabatier and Jenkins-Smith 1993: 3-4). Instead, an interactive, network based approach to policy analysis is suggested, since, as Lindblom and Woodhouse (1993: 10-11) put it, “policy making is ... a complexly interactive process without beginning or end”. According to the critics of the stages heuristics, the policy process is dynamic; affected simultaneously by actors on several different political levels. Therefore, all actors, both private and public, engaged in one policy area; politicians and civil servants as well as journalists, experts and non-governmental organisations (NGOs) should be included in policy studies (Sabatier and Jenkins-Smith, 1999). Similarly, Peters (1998), argues that an increasing part of governing today takes place through networks consisting of a variety of actors. Hence, the dynamic view of the policy process, rather than the stages approach, provides a fruitful point of departure for this study, since it ties in with multi-level governance and since, according to
Nilsson (2005, p. 209), policy learning studies are built on the premise that “policy is formed in networking processes with multiple actors, both public and private (including government organisations, interest groups, political parties, and scientists), which have different ideas and interests”. The learning approach to studying EPI is not new, it has been applied in previous studies (e.g. Jachtenfuchs and Huber, 1993; Lenschow 1999; Lenschow and Zito, 1998; Nilsson and Persson, 2003; Nilsson and Eckerberg, 2007). Nevertheless, the process-oriented view on EPI as learning requires a deeper explanation of the learning concept and a discussion regarding how learning can be detected. The objective of this section is to discuss the background behind the view on the EPI process adopted in this thesis, asking: who learns, what, when, and how (Armitage et al, 2008)?

**Who learns?**

Learning is a process which takes place – and can be studied – on different levels. When studying learning, it is thus important to distinguish between individual learning and collective learning, even though this is not always easily accomplished (Kemp and Weehuizen, 2005). The key to understanding these different types of learning lies in asking: who learns? As stated above, this thesis takes on a dynamic view of the policy process, which means that many different types of actors (not only politicians) are viewed as influential for the learning process within a policy area. Given that all organisations, policy areas and governments are essentially built up by individuals, individual learning forms the basis for all types of learning. *Individual learning* refers to the process within an individual, when s/he is taking in new knowledge and changes his/her outlook on basis of this new knowledge (e.g. Sabatier and Jenkins-Smith, 1999; Fazey and Marton, 2002). *Organisational learning* refers to when an organisation as a whole takes in new knowledge and changes its outlook on basis of this new knowledge (e.g. Argyris and Schön, 1978). However, as Kim (1993, p. 38) points out: “organizations ultimately learn via their individual members”. Therefore, the link between individual learning and organisational learning is not always straightforward; these processes are intertwined. Nevertheless, learning can be studied on either the individual or the collective level. When discussing collective types of learning, such learning can be typified as organisational learning or, when “collective learning extends individual companies” (Kemp and Weehuizen, 2005, p. 4) as *social learning*. According to Reed et al (2010), we are currently lacking a common definition of social learning, but the authors suggest that social learning requires three criteria to be fulfilled: 1) an individual change in understanding within involved actors; 2) this change is demonstrated within communities of practice; 3) this change comes about through social interaction within an actor network. Social learning thus has to do with the learning that occurs on a collective
level through social interactions. Nilsson and Swartling (2009), following Tabara (2009), "view social learning as the process by which agents and organisations continuously frame and reframe the issues at stake and develop enhanced content and relational capabilities to deal with common problems which individuals often cannot resolve on their own” (p. 2). In this thesis, the social interactions of relevance mainly occur within bioenergy policy discussions, and the learning of relevance to study is the learning that occurs within policy. Certainly, as stated above, individuals form collectives, and thus individual learning can be said to underlie all sorts of learning on the collective level. However, as Jachtenfuchs (1996, p. 35) states:

*In administrations, it is not unreasonable to assume that individuals act only as agents of the administrations and not in an exercise of their own individuality. They follow bureaucratic procedures and prescriptions and contribute to the administration’s stock of knowledge...In this case, administrative learning is possible without individual learning.*

In this thesis, focus lies on analysing how policy changes, and whether or not environmental issues are considered within policy. This means that learning is studied on the collective, rather than the individual, level. Since environmental policy integration has to do with environmental learning for policy change, focus here is directed onto a specific type of collective learning; *policy learning* (Kemp and Weehuizen, 2005), which according to Sabatier (1993, p. 19) is “a relatively enduring alteration of thought or behavioural intentions that are concerned with the attainment (or revision) of the precepts of a policy belief system”. Policy learning is about policy change, or, rather, policy change can be explained by policy learning (e.g. Sabatier and Jenkins-Smith, 1999). Thus, the question of who learns in this thesis, though recognising that individuals are the ones who build up organisations, focuses on tracing policy learning on the collective level. In practice, the material considered here is mainly policy documents (the collective framing as distilled from the preceding discussions is possible to obtain from final policy documents, rather than the framing expressed by individuals) and interviews with key actors (where the interviewed individuals mainly represent their organisations). However, to study policy learning it is essential to decide what to look for: how do we recognise learning when we see it? This is considered in the next section.

**What is learnt?**

This study employs the concept of frames and looks for reframing of policy in order to trace policy learning. Therefore, the framing/reframing concept is discussed in this section. Furthermore, the conditions through which it can be determined whether or not the detected frame changes can be classified as the type of policy learning here qualified as EPI, are presented.
The concept of frames can be used for a multitude of different purposes, with many different connotations. Before moving on, it is therefore relevant to clarify what I mean by ‘frames’, and how it differs from ‘discourse’. Here, Bacchi’s (2009) concise differentiation between the two concepts is quite useful: where ‘discourses’ are “systems of thought”, ‘frames’ are “ways of arguing” (p. 28). According to Bacchi, discourse underlies and influences frames. Frame analysis stems from many different research disciplines, which have in common to “represent an ambition to explore, and make sense of, people’s multiple understandings of different situations and phenomena” (Beland, p. 68). According to Beland (2008, based on a review of Perry 6, 2005), frames can be used in a micro-sociological sense, focusing on how frames organises experience; in a social psychological anthropology/social psychology sense, focusing on the relation between culture and action; in a cognitive psychology sense, defining frames as a point of reference which can be used to weigh risks; and in a meso-level political sociology sense, focusing on exploring collective action and intractable controversies in a political context.

In this thesis, the frame concept is used in the meso-level political sociology sense, focusing on “the operation of frames at a social or political level rather than on a micro sociological one...or in the mind (Beland, 2008, p. 73). According to this research tradition, policy options rest upon “underlying structures of belief, perception and appreciation, which we call frames” (Rein and Schön 1994, p. 23). Furthermore, frames are “a perspective from which an amorphous, ill-defined and problematic situation can be made sense of and acted on” (Rein and Schön 1993, p. 146). A similar argument is made by Gilbert et al (1998, p. 796), who contend that frames are “opinion recipes, recommendations about how issues should be understood, and therefore which considerations, in what proportions, should be used to construct an opinion”. Related to this is van Gorp (2001, p. 5), who defines a frame as an “organizing principle that transforms fragmentary information into a structured and meaningful whole”. Given these definitions, how do we reconstruct frames?

According to Rein and Schön (1994, p. 24), it is useful to consider frames as a “story told about a troublesome situation...in which the author describes what is wrong and what needs fixing”, and “as the frame an institutional actor uses to construct the problem of a specific policy situation” (p. 33). Policymakers use frames to “perceive problems, manage preferences, formulate solutions, settle disputes and come to compromises” (Fischer, 2003, p. 144). This approach to reconstructing the policy debate to understand policy change is similar to several other researchers’ suggestions. For example, Bacchi’s (1999) “what’s the problem-approach”; or Sabatier and Jenkins-Smith (1993, 1999), who argue that policy coalitions have different views on the policy problem and its solutions; or Kingdons’s
Multiple Streams approach, which holds that in order to understand policy change we need to map out the problem stream (the view on the policy problem), the policy stream (the view on the solutions to the policy problem) and the politics stream (the views exposed in the public debate) (Zahariadis, 1999, 2003).

In order to understand the different views on a policy problem, we can thus study how the problem is “named and framed”, which is how the story about the policy problem makes the “normative leap” from data to recommendations, from fact to values, from ‘is’ to ‘ought’” (Rein and Schön, 1994, p. 26). As Nilsson (2005a, p. 11) argues, frames are “conceptually close, although not identical” to similar concepts such as belief systems (Sabatier, 1988), value premises (Dunn, 2003) and discourses (Hajer, 1995). Similarly, Hall (1993) refers to paradigms. However, what I look for in order to detect EPI is reframing as an indicator of policy learning. Because, as stated in Papers I, II, III and IV, frames are not static; exposure to new knowledge can, in time, lead to reframing (Rein and Schön, 1993, 1994). However, environmental reframing solely in terms of ‘rhetoric’ is not considered sufficient to corroborate EPI in this study. Rather, EPI is achieved when environmental reframing of sector policy objectives has occurred and specific strategies in pursuit of these objectives have been settled. The reasons for this are further elaborated below.

Baumgartner and Jones (2009, p. 44) hold that:

*When we consider a number of issues over long periods of time, we note again and again that the same issue has come to be associated with different symbols, or understandings, at different periods of time. Sometimes these understandings reinforce the positions of the already powerful. In other cases they break up powerful subsystems...Often the same issue can be viewed either from a social or technical point of view; often, single policies have multiple implications, each of interest to a different constituency”.*

Like the authors quoted above, several policy learning researchers divide policy learning into different groups. Nilsson (2005, with reference to Glasbergen, 1996) holds that conceptual learning signifies EPI and refers to long-lasting changes in policy goals and strategies. Technical learning refers to changes in policy instruments, and political learning refers to new arguments which, however, are followed by merely symbolic measures and/or weak implementation. These different learning concepts are in many ways related to Argyris and Shöhn’s (1978) learning loops, which depict the fact that learning can take place at different levels and bring about different degrees of policy change. Single-loop learning refers to minor modifications of rhetoric or practice, while more significant, active work in order to find ways to amend noticed inaccuracies through changing norms and/or to implement major instrumental change, signifies double-loop learning.
(Argyris and Shôn, 1978). Fundamental change, implying in-depth transformation of frames of reference and governance processes, is referred to by Keen and Mahanty (2006), as *triple-loop learning*. Similar arguments about different types of learning are presented by other learning theorists as ‘simple’ and ‘complex’ learning (Nye, 1987); ‘normal’ and ‘meta-level’ learning (Hedberg, 1981) or ‘adaptation’ versus ‘learning’, where:

*Adaptation is change that seeks to perfect the matching of ends and means without questioning the theory of causation defining the organization’s task. Adaptation does not require new consensual knowledge...Learning involves the penetration of political objectives and programs by new knowledge-mediated understandings of connections (Haas, 1990, p. 36).*

This shows the importance of separating between different ‘degrees’ of learning. In this thesis, this is accomplished by distinguishing between policy rhetoric and practice, and, in order to be classed as environmental integration, environmental learning must be detected in both rhetoric and practice (see Table 3.2). Paper I develops a definition of EPI, which builds upon dividing these different types of learning into different categories, distinguishing between environmental policy integration and learning in rhetoric and practice. When environmental considerations are visible in policy rhetoric and also underpin policy practice, we are in square 1, EPI, or conceptual learning. When environmental rhetoric is visible, but does not underpin policy practice, we are in square 2, Rhetorical EPI, or rhetorical (political) learning. When environmental considerations are visible in policy practice but do not stem from environmental awareness expressed in policy rhetoric, we are in square 3, Instrumental (technical) learning.

**Table 3.2. Different types of learning (from Paper I)**

<table>
<thead>
<tr>
<th>ENVIRONMENTAL CONSIDERATIONS UNDERPINNING POLICY PRACTICE</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIRONMENTAL Rhetoric</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>1. EPI</td>
<td>2. Rhetorical EPI</td>
</tr>
<tr>
<td></td>
<td>3. Instrumental learning</td>
<td>4. No EPI</td>
</tr>
</tbody>
</table>

1. The EPI process is working. Environmental issues are integrated in policy rhetoric as well as in policy practice.
2. The EPI process is rhetorical. Environmental issues are not considered in policy practice.
3. Instrumental learning. Environmentally sustainable policies do not stem from environmental awareness.
4. No environmental consideration in either policy rhetoric or practice.

As Bennet and Howlett (1992, p. 285) argue: “learning does not actually occur unless there is some kind of policy change which results from that learning process”. Similarly Gerger-Swartling et al (2007, p. 50) note that: “Policy learning implies a change in thought about policy, which subsequently contributes to a change in the policy process. Policy change, in turn, is widely considered to be a prerequisite for sustainable development”. 

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In other words; cognitive EPI is about (environmental) policy learning inducing policy change in non-environmental policy sectors. In this thesis, (environmental) policy learning is traced through the analysis of text in order to identify policy frames, and subsequent changes in these frames. How policy frames are detected will be further discussed in the methodological section.

**Coordinating multiple sectors and levels for EPI (or, learning: when and how?)**

The when and how of EPI is mainly studied here through comparing the framing of bioenergy within different sectors on different levels over time in a search for cognitive EPI, or policy learning, and policy coherence. The timing of policy change is regarded as an indicator of the “learning flow” between sectors and levels. Thus, depending on where a reframing is detectable first, some indication of who learns from whom can be obtained. The learning flow is also further explored in interviews with key bioenergy actors. It is however, after the account above on how the cognitive approach to EPI is used in this thesis, relevant to point out that merely the fact that policy does indeed change, does not automatically mean that policy learning has taken place.

For example, according to the extensive Europeanization literature (on European integration), adoption of EU policy influences domestic structures, public policy as well as cognitive and normative structures (Radaelli, 2003; see also Börzel and Risse, 2006), and adaptation to EU policy is, in this research tradition, viewed mainly as a steering instrument, which limits the domestic opportunity structures in terms of both practical and cognitive space (e.g. Knill and Lenschow, 1998; Knill and Lehmkull, 2002). Furthermore, the Europeanization literature contains a multitude of explanations for when and why adaptation to EU policy takes place in Member States (see e.g. Kohler-Koch, 2002; Falkner, 2000, 2005). Although Jordan and Liefferink (2006) looks into the Europeanization of environmental policy on the national level, the EPI-literature has thus far paid little attention to the view on European integration advocated by the Europeanization literature; and to the explanations to European integration provided by this research tradition. This will be further discussed in Chapter five. However, adaptation to EU policy is in this thesis viewed as a form of learning, which sometimes is strictly instrumental/rhetorical and sometimes both instrumental and rhetorical (when new perspectives reach both policy rhetoric and instruments).

The Europeanization view on adaptation is, however, in a broad sense, related to the institutional and political approaches (Lenschow and Jordan, 2010) to EPI, which we now turn our attention to in order to further understand the when and how of EPI. Policy change may result from
changes in the environment, which Sabatier and Jenkins-Smith refer to as external events. Similarly, Kingdon (1995) uses the concept of policy windows to explain why opportunities for policy change arise. Reframing is therefore studied here using policy documents, but changes in the environment of the debate are also taken into account when analysing the reasons behind policy change. This is especially important in Paper IV, where it is argued that sub-national politicians have become more susceptible to environmental arguments since the European debate has changed. Thus, especially in small, rural communities, they see the opportunities for local “green” business and job creation.

Institutional factors for EPI are mainly addressed in Paper II, but are also included in the final discussion in Chapter five. When examining institutional factors behind EPI development in bioenergy policy, the analysis concentrates on factors previously identified as obstructive/conducive to EPI. Institutional factors that inhibit or advance EPI have been explored in many previous studies, and there are multiple ways of approaching the subject. The EEA (2005a) has highlighted institutional coordination, planning and monitoring systems, assessment and consultation procedures as important factors in achieving EPI. Similarly, Meijers and Stead (2004), in an overview of the important conditions for coordination, cooperation and integration to occur, argue that “policy integration does involve co-ordination and co-operation, just like it does involve inter-governmental management and network management” (p. 6). Therefore, a few words on factors relevant for EPI according to previous research, especially regarding important factors for policy coordination (which is highly relevant for EPI, especially in multi-sector issues, see Paper I, II, III) are appropriate.

For factors that benefit or hinder coordination, Meijers and Stead (2004) point to Halpert’s (1982) argument that inter-agency coordination results from the competition between interpretive and contextual factors, where “interpretive factors relate to individuals (attitudes, values, and perceptions for example), whilst contextual factors relate to internal organisational or environmental conditions” (Meijers and Stead 2004:6). According to Halpert (1982), interpretive factors which facilitate organisational coordination include perceived need; positive attitudes; maintenance of prestige or power; common commitment; similar resources, goals or needs; good historical relations; and common definitions, ideologies, interests or approaches. With regards to which contextual factors facilitate coordination, Halpert suggests actual needs or benefits; standardisation; decentralisation; professionalism; informal contacts or exchange of information and resources; occupational diversity; geographic proximity; complementary organisational or personnel roles; and similarity of structures, supply capabilities, needs of services (see Meijers and Stead, 2004:7 and Halpert, 1982). Thus, according to the
argument above, the likeliness of policy coordination increases when similar framing of a policy issue exists in different sectors; and when contextual factors allow for a decentralised, informal policy process where different sectors see the need for communicating with each other.

Peters (1998) argues that there are three reasons why policy coordination is becoming increasingly difficult to achieve. The first reason is the gradually more crosscutting nature of issues (of which sustainable development is a prime example). The second is the contribution of decentralisation trends towards incoherence (which is an argument in direct opposition to Halpert’s argument mentioned above, where decentralisation is viewed as increasing coordination); and the third reason is the disaggregating of structures into multiple agencies and multiplying activities. Since policy coordination is often achieved by collaboration in networks across different organizations, Peters (this time to a certain extent in line with Halpert’s argument presented above) further proposes that certain dimensions of variation in networks will influence their likelihood of producing effective coordination, namely: 1) the degree of pluriformity (some are so integrated that they can be treated as a single organisation while others are little more than collections of autonomous organisations); 2) the extent of interdependence (whether networks are loosely coupled or closely interconnected will influence the styles of interaction and relationships); 3) the degree of formality; and 4) the nature of the instruments used (i.e. planning, formal regulation, contracts). Finally, Peters offers some practical implications to consider (pp. 304-308):

- Organisations that are closest together ideologically and that provide similar types of service are the most difficult to coordinate (even if individual professional networks might counteract this tendency);

- The iterative nature of interaction promotes coordination compared to a once-off event because it provides cooperation incentives for participants in the process of achieving long-term gains (such reasoning is supported by game theory, see e.g. Axelrod, 1987 especially pp. 19-30, 108-113; and Carlsson 2000a, pp. 157-158).

- The typical image of coordination is as a top-down process, with central agencies or lead ministries forcing cooperation among subordinate organisations (for such arguments, see for example Lafferty, 2004 on horizontal EPI, which refers to the existence of a central organisation for EPI coordination). In practice, however, coordination is often a function of negotiations among the lower echelons of organizations around specific issues or clients;
Inter-organisational coordination efforts have a profound impact on the capacity of governments to hold organisations accountable: one obvious issue in accountability is the capacity to identify who did what, which might be lost when organisations meld their actions and use complex networks for service delivery.

Thus, according to Peters (1998), the likeliness of policy coordination increases when professional networks exist, which interact repeatedly e.g. around specific issues.

Similarly, Kickert and Kopenjan (1997) hold that, in order to make sure that there is support for – and a consensus in – the course of action undertaken in a network by the different organisational representatives, “leadership qualities” are of utmost importance (Meijers and Stead, 2004, p.8). Leadership has also been pointed out as important in EPI research. Lafferty and Ruud (2004), in a study of institutional conditions for EPI in Norway, suggest that political will is crucial for environmental political intentions to materialise. This is also furthered by EEA (2005a) as well as in Lafferty, Ruud and Larsen (2004):

[T]he lack of political will covers a multitude of EPI-related “sins”... [in the current study of Norway] indications are strong that political will triggered original EPI efforts in the first place (under Gro Harlem Brundtland’s leadership), but that the impetus to follow up has steadily declined since (approximately) the mid-1990s (Lafferty, Ruud and Larsen, 2004, pp. 37-38).

Correspondingly, Nilsson and Eckerberg (2007, p. 166) identify participants’ trust in that they benefit from cooperation; development of trust and joint-problem perceptions; alignment of reframing with short-term sector interests; and strong political leadership as important factors for cognitive EPI.

The factors pointed out as conducive/obstructive for EPI also draw upon, and therefore come close to, implementation theory. For example, Goggin (1986) contends that four factors are important in policy implementation studies:

1. the form and content of the policy itself; 2. the capacity of the organization(s) responsible for making the programme work; 3. the qualifications of the people in charge of the operations; and, 4. the environment (Goggin, 1986, p.332).

The “environment” in this case refers to exogenous factors, which also are mentioned by Halpert (1982, see above) and by Sabatier and Mazmanian (1980), who argue that socio-economic conditions and technology; media attention surrounding the problem; public support; and attitudes and resources of constituency groups are important exogenous factors for the success or failure of policy implementation. In Paper II the role of such
external factors, or international and national events outside the policy sectors, for EPI are explored. To sum up this discussion, the likelihood of policy coordination increases when similar framing of a policy issue exists in different sectors; when contextual factors allow for a decentralised, informal policy process where different sectors see the need to communicate with each other; and when professional networks exist, which interact repeatedly e.g. around specific issues. As briefly addressed above and discussed in-depth in Paper II, previous research points out four main institutional factors as important for EPI: open actor access to policymaking; use of environment-related knowledge; use of monitoring mechanisms; and coordination mechanisms. Other factors of importance identified in this chapter are strong political leadership or political will as an important factor for cognitive EPI.

**Summing up**
This chapter has, first, pinned down how cognitive EPI is approached and traced in this thesis, namely: *by tracing policy learning through looking for reframing of policy towards incorporating environmental objectives (aspirations, targets, requirements) in policy rhetoric and practice over time.* Second, it has provided a definition of *weak and strong EPI*, and how these categories are related to anthropocentrism/ecocentrism and ecological modernisation/sustainable development. Third, this chapter has showed that previous findings on institutional and political factors that have an impact on EPI direct analytic attention to *organisational features and policymaking procedures* (where policy coordination/coherence is especially important), including aspects such as open actor access; the use of knowledge in assessment processes; and monitoring and coordination mechanisms as important factors for EPI (see Paper II). Furthermore, *external factors*, or policy windows, such as international/national events, also affect EPI. The study of these factors is, apart from being emphasised in previous EPI studies (see e.g. Lenschow and Jordan, 2010), also recommended in well-known theories on policy change and learning and institutional analysis (see e.g. Sabatier and Jenkins-Smith, 1993 and 1999; Hertin and Berkhout, 2003; Lenschow and Zito, 1998; Hajer, 2003). The role of policy coherence and policy coordination for EPI in multi-sector issues is addressed in Papers I, II, III and IV, and what role the institutional and political factors identified above play for EPI in bioenergy policy is further discussed in Paper II and Chapter five.
Chapter four: Research design

Qualitative Researcher: “Many people these days are bored with their work and are…”

Quantitative Researcher (Interrupting): “What people, how many, when do they feel this way, where do they work, what do they do, why are they bored, how long have they felt this way, what are their needs, when do they feel excited, where did they come from, what parts of their work bother them most, which…”


This thesis is a qualitative study, and as such it encompasses the strengths of qualitative research, but also the weaknesses. In this section, the methodological considerations of the thesis are presented.

According to Sabatier and Weible (2007) policy areas “consist of the processes, structures, and actors that are actively involved in the governing of a specific policy issue or problem” (cited in Hysing 2010, p. 57). The policy area in focus in this thesis is bioenergy policy. Different reasons for why bioenergy is a relevant case for an EPI study in general and for a multi-sector EPI study in particular, have already been discussed earlier. However, the scientific argument for focusing on one single case, as well as the chosen arenas for comparison regarding the multi-level study (EU; Sweden; Biofuel Region), also require justification.

How to make sense out of a complex case study

According to Gerring (2007), a case is crucial (or critical) “when it is most, or least, likely to fit a theoretical prediction” (p. 115). In line with this, Yin (2008) instead refers to a “critical case” as a case well-suited to “confirm, challenge or extend” an existing theory (p. 47). Yin argues that a single critical case can be used in order to: “determine whether a theory’s propositions are correct, or whether some alternative set of explanations might be more relevant”. As argued earlier, bioenergy can, due to its status as a renewable energy source, be classified as a crucial most-likely case for EPI: if it does not happen within renewable energy policy areas, where is EPI supposed to happen? However, the multi-sector, multi-level characteristics make bioenergy different from previous EPI studies. Thus, the study of bioenergy policy will extend EPI theory; do the presumptions of single-sector EPI also hold for multi-sector EPI, or does the theory need adjustment to fit multi-sector issues?

Within the single, crucial most-likely case of bioenergy policy, the thesis explores EPI in two different sectors, on three policy levels, over time. Such within-case-comparisons enable the study to be classified as an embedded,
Research design

**single case-design** (Yin, 2008, p. 42, see also Scholz and Tietje, 2001). Single-case studies are often criticised on the basis of scientific and external validity because of their lack of theory-developing aspiration and the difficulties in drawing generalising conclusions from such endeavours (cf. Devine, 2002; Esaiasson et al, 2005; Lijphart, 1971; Van Evera, 1997; Yin, 2008). While this critique is indeed legitimate, there are still, as indicated by e.g. George and Bennett (2005), Rogowski (1995) and Lijphart (1974, 1975), many reasons for meriting single case-studies with a place in science. First of all, in-depth explorations of single cases lay out the basis for future comparative studies. Furthermore, single-case studies may generate new hypotheses as well as provide important insights into unexplored empirics, which can be of relevance when advancing theories in future research.

The fact that the EPI process in Swedish, European and regional bioenergy policy is uncharted, that similar characteristics are found in other issues, and that most previous EPI studies have overlooked the special circumstances surrounding multi-sector policy issues justify the adoption of a single case-study approach in this thesis. Furthermore, even though this study certainly does focus on one single case, the multi-sector and multi-level characteristics of the case, as well as the relatively long time-span of the study mean that there are good prospects for comparison between subunits within the case. Therefore, some of the weaknesses of single-case studies are overcome by the embedded design, involving within-case comparison across sectors, levels and time; which means that the study aspires to contribute to theory-development, and the array of similar policy areas increases the possibilities for generalising conclusions (George and Bennett, 2005; Lijphart, 1975).

**Policy levels in focus**

Three policy levels are in focus for the multi-level study. In a way, each different level can be considered a separate case within the case of bioenergy policy. Bioenergy policy is studied within agricultural policy and energy policy on the EU and national levels (Sweden); and sub-national level bioenergy policy is studied in Sweden, where the Biofuel Region is in focus. In this section, the considerations underlying the chosen objects of study are presented.

Starting with the choice of studying EU bioenergy policy, this is relevant for three main reasons. First, as EPI is a central objective within EU policy it is relevant to study the extent to which different EU policies live up to the EPI aim. Secondly, the role of biomass will increase if the EU is to realise its 202020-goal (EP and C, 2009). Thirdly, EU-regulations entangle Member State sector policy within a multi-level policy web. Thus, the EU is by definition a multi-level governance system, in which all policies must travel
between different political levels during the policy process, and where many different actors on different political levels partake in policymaking (e.g. Bache and Flinders, 2004). These characteristics make the EU a relevant case for a MLG study, an EPI study and for a bioenergy study.

Moving on to the choice of Sweden for the national case study, Sweden is generally known to be one of the “green member states” of the EU (Liefferink and Skou Andersen, 2005), and a forerunner within sustainable development (e.g. Lundqvist, 2001, 2004). Nilsson (2005a) argues: “Sweden can be considered a critical ‘most-likely’ case for EPI. If it does not work here, it is unlikely to work elsewhere” (p. 16). Sweden’s history of corporatism; the influence of expert knowledge in policymaking; and its reputation for being a forerunner in environmental policy are preconditions that previously have been pointed out as conducive for EPI (Nilsson, 2005; Lundquist, 2004; Kronsell, 2006). In Sweden, energy sector actors have gradually become more aware of the climate issue and Swedish energy policy is currently striving for an increased use of renewable, non-fossil energy (Nilsson, 2005). Markets for bioenergy already exist in Sweden, the country has large forested areas and regional heating plants are relatively common. Agricultural bioenergy crops such as energy forest and energy grass could also be used in future production of second-generation biofuels such as cellulose-based ethanol and biogas. Indeed, Swedish research and development (R&D) in this area has long been world-leading (Berndes et al., 2004; Börjesson & Berndes, 2004; Wahlstedt & Berndes, 2003; Eriksson et al., 2004; Vattenfall, 2001). This makes Sweden a potential positive case both for EPI and for bioenergy growth. Furthermore, despite more than three decades of bioenergy promotion in Swedish policy, there are no previous studies of bioenergy policy creation in Sweden which come from a political science perspective, much less with a holistic scope (covering the influence of the EU- and sub-national levels) and focusing on EPI.

With regard to the sub-national case study, the development of biofuel interest in Sweden has been exceptional during the first decade of the 2000s, within the geographical area of Västerbotten and Västernorrland, which comprise the Biofuel Region. This region was initiated in 2002/03, and is a non-profit organisation whose aim is to create and manage “the development of an entirely new industry centred on renewable fuels from cellulose-based raw materials obtained from forest, field and recycling sources (Christensen, 2005, p. 18). A large number of regional administrations, industrial actors, state actors and municipalities within the region either are or have been involved in the project, which has expanded geographically over time (to include Jämtland and Norrbotten in 2010). In 2003, nine gas stations offered biofuel (E85) and there was a low interest in green cars. In 2009, 75 gas stations offered E85, two offered biogas and 33% of new cars were classified as green cars. In 2010, four production sites for biogas, one for
DME (dimethyl ether) and pine diesel and one for bioethanol were running in the region (Paper IV). Because of this unique expansion, the political processes behind this development are of relevance to study in the context of EPI. The Biofuel Region is a pioneering case in terms of regional biofuel development in Sweden; it is a famous project, which has now been going on for almost a decade. These characteristics make the BFR highly relevant in the study of sub-national bioenergy development and EPI. There is no other comparable case on the sub-national level in Sweden.

All-in-all, the study of bioenergy is of relevance not only because of the lack of previous research on this subject but also because of bioenergy’s characteristics which mean that this thesis can be distinguished from earlier EPI studies. The study of environmental policy integration in a multi-sector issue like bioenergy policy thus provides new theoretical as well as empirical insights for researchers, environmental actors and policy makers, which may help in the move towards an ecologically sustainable society at the same time as the findings are expected to have bearing on other types of policy issues and studies.

Table 4.1: An Embedded Single Case Research Design

<table>
<thead>
<tr>
<th>CRUCIAL CASE</th>
<th>BIOENERGY POLICY</th>
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<tr>
<td>Multi-level subunit 1: EU-level</td>
<td>EU bioenergy policy framing</td>
</tr>
<tr>
<td>Multi-sector subunits: Two sectors</td>
<td>1a) Bioenergy in EU energy policy</td>
</tr>
<tr>
<td>Multi-level subunit 2: National level</td>
<td>Swedish bioenergy policy framing</td>
</tr>
<tr>
<td>Multi-sector subunits: Two sectors</td>
<td>2a) Bioenergy in Swedish energy policy</td>
</tr>
<tr>
<td>Multi-level subunit 3: Sub-national level</td>
<td>Bioenergy framing in Biofuel Region</td>
</tr>
</tbody>
</table>
Methods and materials

**Text analysis**
In his dissertation from 1984, Jörgen Hermansson holds that when analysing ideological development within party-politics, one must separate between “varat, börat och görat”, that is, the view on “the is” (how do the actors describe the present); the view on “the be”, how it should be (what goals do the actors have); and the view on how to get from “is” to “be”, that is, the view on “the do” (p. 29). In order to trace frames, thematic idea analysis (described broadly as text analysis in Paper III and IV) is applied in this thesis. The themes of the content-focused idea analysis applied in paper I, III and IV, are well in line with Hermansson’s three “idea-complex”, and are adapted from Jachtenfuchs (1996) and Nilsson (2005). The text analytical method applied here is qualitative. While quantitative text analytical methods are focusing on the measurement of certain objects in texts for a specific research aim (Bergström and Boreus 2005; Krippendorff 1980; Mayring 2000, 2001), qualitative text analysis may employ ideal-types, dimensions with dichotomous categories or themes and questions to guide the analysis (Bergström and Boreus, 2005; Esaiasson et al, 2005). Here, themes and questions are preferable since the purpose of this study is to map out and trace changes in the framing of bioenergy within Swedish/European/sub-national policy over time, rather than to classify the material into different predetermined ideal-types or dichotomous dimensions. Thus, the focus here is merely inductive; to illuminate and explore the framing of bioenergy, over time.

The themes and questions used in order to trace framing are Policy goals; what overarching policy goals are stated for the energy and agricultural sector? Underlying problems; what are seen as the main problems for the energy and agricultural sector? Policy strategies; what solutions to the perceived problems are presented, and how are the policy goals to be achieved? Promoted values and role of bioenergy; what values are promoted, and what is the role of bioenergy? The questions are slightly adjusted to fit the different policy levels, but the framing analysis always comprises these four themes (see Paper I, III, IV), in order to make comparison between different levels possible. How these four themes have been articulated in bioenergy policy documents in the energy sector and in the agricultural sector on the European level from 1995 to 2009 (Paper III) and on the Swedish level from 1975 to 2009 (Paper I and II), as well as on the sub-national level, exemplified by the development within the Biofuel Region from 2002-2010 is examined. The study mainly concentrates on tracing reframing in overarching policy documents, rather than on explaining individual actors’ contributions to the final policy framing, thus focusing on (collective) policy learning. When tracing learning, the
Research design

development of bioenergy framing between different policy rounds are compared. In line with Nilsson and Eckerberg (2007), policy rounds are defined as “phases in policymaking when certain ideas and policy trends have dominated the agenda and decisions” (Paper I, p 385). In the concluding chapter of the thesis, the development of bioenergy framing is compared between different policy rounds across different levels, in order to trace learning across levels.

**Document studies and semi-structured interviews**

The major part of the empirical material for identifying policy rounds, framing and formal institutional factors such as organisational structures and actors involved in each policy round, have been collected through studies of policy documents, official reports and other public documentation in order to capture the dominant policy frames and how they change over time. As argued in Paper III:

> since the ambition of this study is to trace ‘if’ EPI has taken place, final policy documents – though they are indeed watered-down, compromise products – represent the essence of the ideas which ‘won’ the discursive floor, precisely because they are compromise products. The study will thus not be able to capture all the frames present within policy debate, but it will manage to pin down the different frames that ‘made it’ to the final text and thus directly influences...bioenergy policy. If leading actors have learnt during the studied periods, reframing will be visible in final policy documents. Therefore, reframing in final policy documents is a good indicator of policy learning and policy change, and environmental reframing in final policy documents is a good indicator of EPI (Paper III).

For the EU study, 30 policy documents were analysed, including White and Green papers, directives, communications, action plans and strategies, and secondary sources such as reports, journal articles and books were also consulted where appropriate. For the Swedish study, around 60 policy documents were analysed, including Government bills, Government letters, and Committee reports and eight relevant EU policy documents were also consulted. For the sub-national case study, the text analysis revolves around two progress reports on the Biofuel Region (BFR) development between 2003 and 2010 and a previous study on the growth of the BFR (Christensen, 2005) based on interviews and participatory observation.

In order to obtain further knowledge of the policy process, especially knowledge on informal institutional factors such as the existence of informal norms, informal networks and power structures concerning the influence of various actors in the policy process, the analysis also draws on transcripts from a set of semi-structured interviews with key actors involved in the studied policy processes. In total, 24 interviews were carried out for the specific purpose of this thesis, either in person or via telephone (complemented by over 50 interviews conducted within a previous research
project on EPI in Swedish energy and agricultural policy). The interviews were recorded (with the interviewee’s permission) and transcribed. All interviewees agreed to be contacted again if anything was unclear or any new questions arose regarding their answers during the analysis.

Semi-structured interviews, rather than structured interviews, were considered preferable for this study, as this interview-technique allows the researcher to guide the interview to the specific areas of interest for the research, but at the same time allows the interviewee to speak openly about the policy process instead of being forced to choose between closed categories of answers. Since the kind of knowledge sought here is the interviewees’ subjective opinions on how the policy process works, semi-structured interviews organized around specific themes and questions with open answers are appropriate (see e.g. Devine, 2002). In the EU and Swedish studies, the interviews mainly constitute a way of triangulating and increasing the validity of the conclusions from document studies but are also a source of informal information on the policy process. In Paper I, II and III, the interviews were therefore mainly used as a way to make sure that key actors involved in the analysed policy processes seemed to agree with my conclusions regarding detected policy frames and main policy developments. Therefore, actors with deep insight into the studied bioenergy policy processes at the EU-level and Swedish level were identified. Interviewees were identified mainly through policy documents and websites but complemented by the snowball sampling technique, where contacted actors were asked to name relevant individuals for me to interview. The employment of different sources in order to locate informants minimizes the risk of biased sampling, i.e. of only finding the persons within the contact web of the first person asked (see e.g. Gissendanner, 2003). All of the interviewees had actually been involved in bioenergy investigations and/or political negotiations in either the EU or the Swedish context, and the interviews were conditioned by full anonymity (which is why it is impossible to even write out to which DG the different top-level Commission Officials belong, and which NGO the interviewees represent). A number of interviewees had experience from bioenergy negotiations on both policy levels.

In the EU-study, interviews were made in autumn 2008 and the interviewed actors include three top-level Commission Officials from different bioenergy related Directorate-Generals. To get insights also from other parts of the political system, an EU-parliamentarian who has been highly involved in the bioenergy discussions in the EU Parliament was also interviewed. Finally, representatives from one agricultural and one biomass NGO were interviewed to capture the view on policy development from the industrial perspective. For the Swedish study, interviews were made between autumn 2004 and autumn 2005. The Swedish actors interviewed for the
specific purpose of this thesis include three senior officers from the Swedish Energy Agency, four senior researchers on bioenergy/agriculture and senior representatives from the Swedish Farmer’s association (many of these interviewees have experience from different parts of the bioenergy chain, and long-term insight into the bioenergy policy process). Furthermore, secondary analysis was carried out of interview material collected within an earlier research project, in order to gain insights into the general context within energy and agriculture, and to examine on how bioenergy (if it was addressed) was depicted in these interviews. This material consisted of over 50 transcribed interviews conducted in 2003-2004 regarding EPI in Sweden within energy and agriculture with leading Swedish politicians, civil servants and NGO representatives with long-term experience of bioenergy-related policy areas was also conducted for. In the sub-national study, of the Biofuel Region, interviews play a more important role as a source of first-hand information on how bioenergy is currently framed and whether the view on bioenergy has changed within the region over time. In this study, ten interviews were conducted during spring 2010 with actors in possession of deep insight into the internal discussions within the BFR. The interviewees also represent the different types of actors involved in the BFR, including leading politicians and civil servants from small and large municipalities, municipal energy companies, forest and agricultural industry, and national-level civil servants from the Swedish Transport Administration.

Methodological reflections
Before finalising this methodological chapter, a few reflections on the implications of the chosen methodological pathways are required. First of all, what would have happened if I had chosen a quantitative view on EPI instead? This would have been possible, as there are indeed quantitative studies of EPI. Such a study could probably have compared a larger number of cases, which increases the generalizability of a study. On the other hand, previous quantitative studies on EPI usually focus on measuring the EPI within national policy as a whole, through counting the number of different environmental instruments, for example. Thus, quantitative EPI focuses on something else, and more shallowly, than I do in this study. It is questionable whether it is even possible to use a quantitative measure to study EPI within one issue such as bioenergy. Therefore, the chosen path to study EPI as policy learning, qualitatively and in-depth within one issue over two policy sectors and three policy levels provides a ‘fuller’ picture of the EPI process than could be achieved in a quantitative study.

As regards the chosen policy documents to study, it is certainly possible to argue that the media debate, NGO reports and other similar documents could have been included within the study. The intense media debate,
especially regarding bioethanol, which has blossomed recently, would of course be highly interesting to analyse. However, as this study mainly focuses on policy learning and how EPI develops within bioenergy policy, it is reasonable to leave the media debate aside. This debate may certainly have affected policy, as an external factor, and is also mentioned in interviews, but it is not relevant to analyse in depth within the scope of this study. Focus here lies on policy learning in order to trace EPI rather than on analysing and explaining the development of the general debate on bioenergy in society as a whole.

Regarding the choice to rely heavily on document studies, complemented by interviews with key bioenergy persons, rather than attempting to interview ‘all’ relevant bioenergy actors, the justification for this choice is similar. The aim here is to analyse policy learning, which is found in policy documents. If I would have aimed to study individual learning within the policy area, a larger number of interviews would have been both reasonable and necessary, but when aiming to capture the learning in policy, document studies provide the most reliable picture. However, since this is a qualitative study, there is always a risk for biased interpretation by the researcher. Therefore, as mentioned above, the interviews with a number of key persons with good insight into bioenergy policy development served as a method of triangulation – to make sure that my interpretation of the policy texts was correct. The interviews on the EU, national and sub-national levels provided important confirmation of my interpretations both of the development within policy, and on the institutional factors which I identified as relevant for EPI in bioenergy. Furthermore, they contributed with information on informal processes, which cannot be captured in policy document studies. Would a larger number of interviews have contributed with other insights? It is, of course, difficult to say with absolute certainty, but considering the focus and scope of this study; the type of informants contacted; and the fact that the different informants presented similar views on the general development within bioenergy, it is unlikely that more interviews would have contributed in any significant way to the results of this study.

With regard to the choice to conduct semi-structured rather than structured interviews: is there a risk that I influenced the answers given in interviews? I find it unlikely. The questions were general, open ended and all interviews lasted for 1-2 hours. Thus, there was plenty of time to develop the answers to the questions, and it was the informant’s answer that steered the interview, rather than a pre-structured interview form. However, given that the interviewed persons were key persons and many of them thus were top-level bureaucrats with long-term experience, it is of course possible that they would have answered differently if I had been a middle-aged white male rather than a young, Swedish, female, PhD-student. However, the fact that the informants were sent an interview outline by e-mail before the interview,
and that the interview outline was structured so as to capture the necessary information for confirming/amending the results from the document study, and the fact that the informants were promised full anonymity – I believe that my informants provided me with a trustworthy picture of the developments within bioenergy, and the processes guiding it.

Table 4.2 below shows how different methods and materials are applied in different parts of the thesis.

**Table 4.2: Overview of the study**

<table>
<thead>
<tr>
<th>Where?</th>
<th>What?</th>
<th>How?</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Paper I</td>
<td>EPI in Swedish bioenergy policy 1975-2005</td>
<td>Thematic idea analysis of around 60 bioenergy documents</td>
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</tr>
<tr>
<td></td>
<td>Intersectoral policy coordination (agriculture-energy)</td>
<td></td>
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<tr>
<td>Paper II</td>
<td>Institutional factors for multi-sector EPI, and its outcomes, in Swedish bioenergy policy 1989-2009</td>
<td>Exploring five hypotheses through text analysis of around 60 policy documents and transcripts from around 60 interviews</td>
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</tr>
<tr>
<td>Paper III</td>
<td>EPI in EU bioenergy policy 1995-2009 (and to what extent) Policy coherence (agriculture-energy)</td>
<td>Thematic text analysis of EU bioenergy final policy documents (energy and agriculture) and transcripts from interviews with six key actors</td>
<td></td>
</tr>
<tr>
<td>Paper IV</td>
<td>Sub-national implications of higher-level EPI Sub-national framing of bioenergy 2002-2010 Learning?</td>
<td>Thematic text analysis of BFR-documents and transcripts from interviews with ten key BFR actors</td>
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Chapter five: Results of the study

Dissecting the ‘E’ and the ‘I’ of multi-sector, multi-level EPI in bioenergy

In Chapter one, the aim of the thesis was set: to analyse the EPI process in a multi-sector issue, with a multi-level perspective, over time. Four research questions were also enunciated:

1) How can EPI be detected and ‘measured’, and how is EPI conceived in policy documents?
2) How does EPI in a multi-sector issue (bioenergy) travel between different sectors?
3) How does EPI in a multi-level issue (bioenergy) travel between different levels of government?
4) Is there policy learning over time, indicating EPI in bioenergy policy, and what factors can be identified as important for multi-sector/multi-level EPI in bioenergy?

The answers to the four research questions are now presented, based on the four appended papers and the preceding four chapters. The first research question has been discussed and answered within the scope of Chapter two, three and four, and the results from the preceding discussion are therefore only briefly repeated here. In Chapter two, the setting of EPI in research and in policy was presented, which showed that there is a lack of knowledge regarding EPI in multi-sector and multi-level issues. Furthermore, the history of EPI in UN and EU policy was discussed, and the current placement of EPI in EU policy within Article 6.1 in the Lisbon Treaty was presented. In Chapter three, a cognitive approach to the “if” and “how” of EPI was adopted while also recognising the institutional and political perspectives as being relevant for the analysis of the “how” of EPI. Cognitive EPI was set to be traced by a policy learning approach, looking for reframing in policy towards incorporating environmental objectives (aspirations, targets, requirements). Different views on the ‘E’ and the ‘I’ of EPI were presented and used as definitions of weak and strong EPI. In Chapter four, the framework for detecting frames (through thematic idea analysis complemented by semi-structured interviews) was outlined.

With regard to research questions 2, 3 and 4, the initial ambition was to attempt to separate the discussion between different sectors, different levels and over time, but as illustrated in Table 5.1, the reality of multi-sector, multi-level EPI in bioenergy policy is too complex to allow for such separations. In brief, the framing of bioenergy is different in the different sectors and on the different levels in the period 1995-2003. However, in the
### Table 5.1 Framing across levels and sectors over time (1995-2010)

<table>
<thead>
<tr>
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<th>1995-2003</th>
<th>2003-2010</th>
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<tr>
<td><strong>Framing</strong></td>
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| EU Energy Policy | ‘bioenergy-for-security’ | ‘bioenergy-for-security’ | Biomass plan and biofuels strategy with sustainability criteria
|                | ‘bioenergy-for-climate-change’ | ‘bioenergy-for-climate-change’                             |
|                | ‘bioenergy-for-agricultural-adaptation’ | ‘bioenergy-for-agricultural-adaptation’ | Coordination needs acknowledged
| **Main developments** | Indicative renewable energy targets in 2001 directive 5,75% target in biofuels directive 2003 | ‘bioenergy-as-entrepreneurial-practice’ ‘bioenergy-for-climate-change’ |
|                | Agenda 2000                    | 2003 CAP reform, aid for energy crops, measures based on climate change. End of 2008, new measures to encourage investment in renewables |
| EU Agricultural Policy | ‘bioenergy-for-agricultural-adaptation’ | Agenda 2000 |
|                | ‘bioenergy-for-climate-change’ | ‘bioenergy-for-climate-change’ |

(only in overarching policy documents)
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<tr>
<td>Agricultural Policy</td>
<td>'bioenergy-as-entrepreneurial-practice', 'bioenergy-for-sustainability'</td>
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<tr>
<td>Biofuel Region</td>
<td>- BFR was initiated in 2002-2003 -</td>
<td></td>
<td>'bioenergy-for-self-sufficiency'</td>
<td>'bioenergy-for-green-transition-and-growth'</td>
<td>From cellulose-ethanol to renewable energy</td>
<td>Global debate, Fire brands</td>
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period 2003-2010, the framing became more similar both between sectors and levels, which have had implications both for the EPI in bioenergy and for the outcomes of bioenergy policy. However, it is very difficult to give separate accounts for the development of bioenergy framing in different sectors, on different levels, and over time respectively as they intertwine with each other. Instead, this final chapter is organised as follows. First, the frames detected within the study are summarised. After that, how the framing has changed over time is examined in order to analyse whether or not cognitive EPI, or policy learning, has taken place in different sectors and on different levels; and whether different sectors and levels seem to learn from each other. Subsequently, the Chapter moves on to discuss the theoretical implications of the thesis: what political and institutional factors can be identified as important for the development of (multi-sector and multi-level) EPI in this study?; what are the implications of different interpretations of the ‘E’ within bioenergy?; is the ‘I’ within bioenergy policy EPI weak or strong, and what are the implications of this? To make the argument easier to follow, Table 5.1 (below) presents an overview of the framing of bioenergy across levels and sectors over time, starting in 1995, when Sweden joined the EU. The table illustrates the different bioenergy views on different levels and within different sectors, and also pins down the main policy developments on different policy levels in the different policy rounds. Hence, as the discussion on EPI on different levels and sectors proceeds, the reader can go back to table 5.1 for an overview.

**Policy framing across sectors and levels over time**
The framing of bioenergy policy within energy and agriculture on the EU and Swedish level; the framing of bioenergy on the sub-national level; and whether or not the framing indicates EPI, is examined in detail within the scope of Papers I, III and IV. Therefore, the results of these studies are only briefly repeated in Tables 5.1, and 5.2 as well as in the text below. The main focus here lies on comparing the development of EPI across sectors and levels over time. Together, the results of the three different studies on EPI on the EU, Swedish and sub-national level provide a picture of the EPI-development within bioenergy policy over time, and of whether or not there are indications of learning across levels and sectors (and if so, where is policy change detected first – who seems to learn from whom?). Since 1995 marks the start of the Swedish EU-membership, the framing of bioenergy is compared from 1995 and onwards between the EU-level and the Swedish (national) level. The sub-national comparison starts in 2002/2003, when the the Biofuel Region was initiated. Table 5.2 provides an overview of the study, including a summary of the results from the appended papers and the thesis.
### Table 5.2: Overview – and results – of the study

<table>
<thead>
<tr>
<th>Where?</th>
<th>What?</th>
<th>How?</th>
<th>Results</th>
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<tr>
<td>Paper I</td>
<td>EPI in Swedish bioenergy policy 1975-2005</td>
<td>Thematic idea analysis of bioenergy documents</td>
<td>EPI has varied over time. Coordination important for outcomes.</td>
</tr>
<tr>
<td>Paper II</td>
<td>Institutional factors for multi-sector EPI, and its outcomes, in Swedish bioenergy policy 1989-2009</td>
<td>Exploring five hypotheses through text analysis of 60 policy documents and transcripts from around 60 interviews</td>
<td>Multi-sector EPI benefits from open access, environmental knowledge, monitoring, coordination, external env policy input. Concrete policy goals/ measures and coordination necessary for outcomes.</td>
</tr>
<tr>
<td>Paper III</td>
<td>EPI in EU bioenergy policy 1995-2009 (and to what extent) Policy coherence (agriculture-energy)</td>
<td>Thematic text analysis of EU bioenergy final policy documents (energy and agriculture) and transcripts from interviews with six key actors</td>
<td>Weak EPI after 2003. EPI in multiple sectors seems conducive to policy coherence in multi-sector issues.</td>
</tr>
<tr>
<td>Paper IV</td>
<td>Sub-national implications of higher-level EPI Sub-national framing of bioenergy 2002-2010 Learning?</td>
<td>Thematic text analysis of BFR-documents and transcripts from interviews with ten key BFR actors.</td>
<td>EPI – yes, but economy is most important: EU/national policy measures including monetary support are effective for concrete outcomes. Learning? Yes, sometimes EPI, sometimes instrumental.</td>
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**Bioenergy frames detected in the study**

In Paper III, three bioenergy frames are detected on the EU-level. The first frame, labelled *bioenergy-for-security* views energy import dependencies for the EU as the underlying problem and therefore promotes a policy goal which strives for a secure, market-based energy supply. This is to be accomplished through the promotion of European energy production in a competitive, market-based way which increases employment within the EU, and bioenergy is within this frame viewed mainly as a domestic energy
source providing a way to enhance the security of the EU energy supply. The second frame is mainly tied to the agricultural sector, labelled ‘bioenergy-for-agricultural-adaptation’, and views costly surplus agricultural production as the underlying problem. Therefore, the promoted policy goal is to adapt agriculture to market conditions through a policy strategy based on public investment in agricultural conversion to alternative production, which provides alternative incomes for farmers while preserving EU agriculture. Within this frame, bioenergy is mainly viewed as an economic strategy to help agriculture survive on the market. The third frame is labelled ‘bioenergy-for-climate-change’, and unsurprisingly sees climate change as the main underlying problem to be resolved. Therefore, the goal within this frame is to increase the supply of renewable energy in order to decrease the emissions of green house gases and increase the sustainability within the EU. This is to be accomplished through a policy strategy based on the promotion of research, production and use of renewable energy in a way which combines economic growth with environmental protection. Within this frame, bioenergy is viewed as a climate-friendly energy source.

In Paper I, four different bioenergy frames are detected on the National level. The first frame is labelled ‘bioenergy-for-security’, and dominated Swedish bioenergy policy within both energy and agriculture during the 1970s and the first half of the 1980s. This frame views the Swedish oil-dependency and international agricultural competition as threats to the Swedish self-sufficiency regarding energy and food (which in turn threatens the Swedish neutrality policy), and therefore strives to achieve a secure energy and food supply. The proponents of this frame promote domestic energy production and agricultural marginal protection and view bioenergy mainly as an opportunity for domestic energy and agricultural production. The second frame detected at the national level, ‘bioenergy-for-agricultural-adaptation’, views surplus agricultural production as the main problem, and therefore aims to adapt agriculture to market conditions. Therefore, alternative production on agricultural land is promoted, and bioenergy is mainly viewed as a way to reduce surplus agricultural production. The third detected frame, ‘bioenergy-as-entrepreneurial-practice’, views the difficulties of balancing security of supply of energy and food with reasonable prices as the main problem. The proponents of this frame aim to promote cheap energy and food with the Swedish consumer in focus through market competition and market-based policy measures. Within this frame, bioenergy mainly provides an opportunity for entrepreneurship and rural jobs, and is an attractive energy source as long as it is competitive with other energy sources. The fourth national level frame is labelled ‘bioenergy-for-sustainability’, and views climate change as the main underlying problem. The proponents of this frame have embraced the concept of sustainable development, and aim to create a sustainable energy supply and a
sustainable agriculture through the encouragement of increased production and use of renewable energy. Bioenergy is viewed as a CO\textsubscript{2}-neutral energy source, which can replace nuclear and fossil energy.

According to the analysis in Paper IV, the framing on the Swedish sub-national level, within the Biofuel region, consists of two different frames, which have dominated the agenda during different phases of the BFR-development. In the first phase (2003-2006), the underlying problem for the region was the oil-dependent transport sector and unemployment. Therefore, the BFR sought to achieve a combination of self-sufficiency regarding transport fuels and regional growth. The policies promoted were supra-national and national investments in specific biofuels, and bioenergy was mainly viewed as a potential regional growth sector. This frame is labelled ‘bioenergy-for-self-sufficiency’. In the second phase (2007-2010), the view on the underlying problem changed towards emphasising both the oil-dependent transport sector of the region and the climate change problematique. Consequently, the BFR sought mainly to achieve societal transition to renewable energy within the region. The policies promoted by the BFR also changed at this time, with demands being made for supra-national and national renewable energy policy goals and investments. During this second phase, bioenergy was mainly viewed as a potential green regional growth sector, and the dominating frame is labelled ‘bioenergy-for-green-transition-and-growth’.

Thus, the framing of bioenergy is different on different levels, even though similar themes reoccur on all levels, especially regarding the need for agricultural adjustment (in ‘bioenergy-for-agricultural-adaptation on both the EU-level and the Swedish level). Regarding the view on security of supply (in ‘bioenergy-for-security’ on both the EU-level and the Swedish level, but also detectable on the sub-national level), there are minor differences between different levels, and also over time. In Sweden, this frame arose during the cold war, and was then abandoned for other frames. However, as we will see below, the security frame reappeared in Swedish energy policy in the late 2000s, now in a version similar to the security framing on the EU-level, and with a view to securing a sufficient energy supply for Swedish industries. On the sub-national level, the security frame has a lot in common with the EU and Swedish framing, but with a much more local focus. The promotion of market-measures is also found within different frames on different levels. Within the EU, market measures are in one way or another part of all three frames, but are most visible within the security and agricultural adaptation frame. In Sweden, market measures are mainly promoted within ‘bioenergy-as-entrepreneurial-practice’.

With regard to the view on ‘environment’ and bioenergy, there are apparent differences between the levels. On the EU-level, the environmental focus is mainly directed towards climate change, although other types of
environmental concerns are represented within the frame. Therefore, on the EU-level, ‘bioenergy-for-climate-change’ aims to increase the use of renewable energy and sustainability, mainly with a view to the threat presented to the EU by climate change (Paper III). On the Swedish level, it is however possible to detect a ‘bioenergy-for-sustainability’ frame, where concern for broader environmental issues is shown (Paper I). On the sub-national level, framing has changed over time: initially, ‘peak oil’ and bioenergy as a regional security issue dominated the debate. However, after 2007, environmental issues have had a much greater impact on the sub-national level debate (Paper IV). Next, how the framing has developed in different sectors, on different levels, over time is discussed.

**Framing and EPI 1995-2003**

In Paper III it is concluded that the framing of bioenergy within EU energy and agricultural policy during 1995-2003 differed between the two sectors (Table 5.1), and that EPI is detectable within the energy sector, but not within the agricultural sector. While all three EU bioenergy frames were present in the energy sector, the agricultural sector mainly focussed on ‘bioenergy-for-agricultural-adaptation’. During this period of time, environmental arguments played an increasingly important role within bioenergy relevant policies in the energy sector, where environment-related motives (although combined with ‘bioenergy-for-security’) in 2001 and onwards can be found both within general policy goals and in justifications for policy measures to achieve these goals, indicating EPI. Within agriculture, however, ‘bioenergy-for-agricultural-adaptation’ dominated the agenda. Bioenergy crops were only allowed on set-aside land and were viewed mainly as a way of reducing surplus-production. Furthermore, member-states’ support for biomass production on set-aside land was allowed to cover up to 50% of the costs. ‘Bioenergy-for-climate-change’ was indeed present within overarching policy documents, but since it was not recognised within CAP measures, the role of the environment within agricultural bioenergy policy is interpreted as being merely rhetorical. During this period of time, agricultural policy goals were recognised within energy sector policy, but policies were not coordinated, as energy policy goals were not recognised within agricultural policy.

As argued in Paper I, both the framing of bioenergy and EPI has varied over time within Swedish bioenergy policy. From a broad-based ‘bioenergy-for-security’ focus within both energy and agriculture in the 1970s and early 1980s, when policies were coordinated across sectors and much research on bioenergy was instigated, to a more diversified framing in the different sectors in the late 1980s, when ‘bioenergy-as-entrepreneurial-practice’ dominated energy sector policy while ‘bioenergy-for-agricultural-adaptation’ dominated agricultural sector policy and energy crops became mainly an
agricultural issue. In 1990-1995, however, EPI started to be detectable, mainly within the energy sector but also within the agricultural sector, policies were coordinated across sectors and policy instruments stimulating both the supply and demand of bioenergy (e.g., investment-programmes and subsidies for energy crop plantation covering nearly 100% of the costs) were instigated. After the EU-membership, EPI continued to be detectable within Swedish bioenergy policy in both sectors and attention was also given to the possible environmental consequences from bioenergy extraction and use. The energy sector was dominated by ‘bioenergy-for-sustainability’, while the agricultural sector now combined ‘bioenergy-for-entrepreneurial-practice’ and ‘bioenergy-for-sustainability’ (Table 5.1). Efforts were made to coordinate policies, but, as shown in Paper II, the constraints from the CAP measures brought about a significant decrease in alternative agricultural production after 1995. In the early 2000s, a combination of ‘bioenergy-for-sustainability’ and ‘bioenergy-as-entrepreneurial-practice’ dominated both the energy sector and the agricultural sector in Sweden. A new renewable energy target (+10% between 2002-2010) was set and the implemented policy measures focused on market competition between different types of renewable energy sources within a renewable electricity certificates scheme. Furthermore, the EU waste strategy encouraged increased incineration of waste in district heating (since recycling includes energy extraction). As stated in Paper I:

\[\textit{During the early years of 2000, energy policy aimed for an increased use of renewable energy and a reduction of CO}_2\text{-emissions, but it also prioritized supply security. Therefore, peat fuels were included in the electricity certificates, and plans for tax-cuts on natural gas were introduced. Waste is now becoming an important bioenergy fuel, partly due to EU-regulations. In the agricultural sector, the focus on (economic) sustainability has resulted in drastic reductions of taxes on CO}_2\text{-emissions and diesel use for farmers...to increase the competitiveness of Swedish agriculture (p. 398).}\]

During this period of time, EPI was detectable within both sectors until 2000. In the new millennium, however slightly different interpretations regarding the indication or not of EPI are made in Paper I and Paper II. It is argued in Paper I that environmental learning was merely rhetorical within the energy sector since environmental arguments were visible in policy rhetoric, but the implemented measures, with a view to supply-security and market competition, meant that bioenergy had to compete with less environmentally friendly energy sources (such as peat and natural gas). In the agricultural sector, EPI was on the one hand visible in both rhetoric and practice since environmental motives had increased in importance after the EU-entry, which also could be seen in the view on energy crops as a means to achieve sustainability. On the other hand, the wish to increase the “economic” sustainability within Swedish agriculture (that is, to enhance the
economic profit) justified tax reductions for fossil fuel use in farming activities (see the quote above). This illustrates the complexities that arise when it is possible to interpret the three-tiered sustainability concept in different ways, which will be discussed further below. In Paper II, these developments are interpreted slightly differently, and when weighing the framing of bioenergy in the two sectors together, it is deemed that since both bioenergy policy rhetoric and measures in both sectors still involved an environmental perspective, it is possible to interpret the development as an indication of EPI within bioenergy policy in energy and agriculture as a whole.

**Framing and EPI 2003-2010**

As shown in Paper III, the attention to environmental concerns within EU bioenergy policy within both energy and agriculture became significantly more prominent both within policy rhetoric and in motivations for policy measures from 2003 and onwards, indicating the existence of EPI. At the same time, policy coherence between the two sectors also increased and agriculture became viewed as a potential contributor to increased sustainability within the EU. In the energy sector, ‘bioenergy-for-security’ was combined with ‘bioenergy-for-climate-change’, and a biomass plan as well as a biofuels strategy including sustainability criteria was presented on the EU-level. In the agricultural sector, ‘bioenergy-as-entrepreneurial-practice’ was combined with ‘bioenergy-for-sustainability’, and the reform of the CAP in 2003 brought with it a new support for energy crops within the EU, with strong references to the climate change problematique. In 2008, investments in renewables such as biomass and renewable energy production within agriculture were encouraged with reference to the EU’s efforts regarding climate change, biodiversity, renewable energy and water management. At the same time, the support for energy crops was abolished since it was deemed unnecessary due to the strong demand for bioenergy. As shown in Paper II, these policy decisions had a significant effect on energy crop cultivation in Sweden (I will return to this discussion below).

Nothing much happened within Swedish bioenergy policy in 2003-2005. In 2006, however, a conservative-liberal coalition won the Swedish election, and this coalition early on marked the connection between climate policy and energy policy as important, consequently, the bioenergy-relevant bill at this time was the 2009 Climate bill (Paper II). Now, the energy sector was clearly influenced by ‘bioenergy-as-entrepreneurial-practice’, even though both ‘bioenergy-for-sustainability’ and ‘bioenergy-for-security’ (which reappeared for the first time in many years) are discernable:

> the renewable energy and energy efficiency venture enhances Swedish supply security and competitiveness at the same time as it contributes to sustainable
Regarding renewable energy development within agriculture, the dominant frame is ‘bioenergy-as-entrepreneurial-practice’, and €20 million was set-aside for biogas investments, both to reduce greenhouse gas emissions and to increase the competitiveness of agricultural entrepreneurs as energy producers:

To increase the use of renewable energy is a prioritised issue for the government, which means great opportunities for rural entrepreneurial development (Prop. 2008/09:163, p. 51).

On the sub-national level, Paper IV shows that bioenergy was framed differently in the beginning of the project than it is today. As stated above, the initial focus (in 2003-2006) lay on decreasing the oil-dependency of the region and, at the same time, increasing the number of local jobs as certain types of bioenergy (mainly cellulose-based ethanol and biodiesel) were viewed mainly as a potential growth sector. In 2007-2010, this has changed and different types of bioenergy are now viewed as a potential green growth sector, which can both help in reducing oil-dependency and in fighting climate change through societal transition to renewable energy.

Are there any differences between EPI in bioenergy on different levels of government?

Accordingly, are there any differences between EPI within bioenergy on the three different levels studied here? It seems so. As the analysis of EPI on different levels shows, there are different priorities on different levels, and also different environmental concerns. As shown in Paper III, although environmental arguments appear both in rhetoric and in practice, and thus EPI as defined here can be discerned, the EU actors are still highly concerned with economy and security. A climate-change framing is also used within the EU to promote non-renewable (but non-fossil) energy sources such as nuclear power as promising energy techniques to reduce CO₂-emissions. In the Swedish context, the environmental debate is more ‘mature’ and focuses on sustainable development in a broader context. Still, however, other issues such as supply security and growth are also competing for political attention (Paper I, Paper II), and plans to build new nuclear reactors to replace the old ones are now in place (often motivated both by supply security and climate change). Similarly, the sub-national level – even though taking in the environmental arguments for bioenergy utilisation – has a much more ‘hands-on’ focus, and here, practical issues such as funding and job-creating opportunities also play a big role for final policy decisions regarding renewable energy ventures in general and biofuel ventures in
particular (Paper IV). This shows that the three tiers of sustainable development: economic, social and environmental – and the built-in conflict between these different tiers – are also highly visible within the bioenergy debate.

However, it is important to point out that bioenergy has also become more problematized from an environmental perspective on all levels during the studied period. From having been viewed generally as an inherently environmentally friendly energy source up until somewhere around 2007, environmental consequences from bioenergy use and production are given much more attention within the policy debate today. Although possible environmental consequences were brought up already during the late 1990s within Swedish bioenergy policy, attention was mainly on the handling of ashes (Paper I). This new view on bioenergy, where the environmental sustainability of the energy source is assessed, is highly visible e.g. in the EU 2009 sustainability criteria for biofuels, which includes both significant GHG-emission savings and biodiversity considerations (Paper III). This has also had effect on the sub-national level, where focus has moved from cellulose-based ethanol to different types of renewable energy which can be produced within the BFR. This implies a more ‘mature’ view on renewable energy sources, which now are problematized, on all levels, from different perspectives in a way not previously experienced.

*Do different levels seem to learn from each other?*

According to my interviewees, the entry of renowned green member states such as Sweden and Finland into the EU has had marginal effect on bioenergy policy development within the EU (Paper III). Thus, when learning occurs between levels in bioenergy policy, it is more of a top-down than a bottom-up process. Such a learning flow is visible on the Swedish policy level, where increased EPI is observed in agriculture after the EU entry in 1995, when CAP was implemented and Swedish agriculture became subject to the overall environmental policy goals for the EC and article 174 of the EC declaration:

*There are also specific environmental goals for agriculture...and member states are required to implement environmental programmes for agriculture (Paper I).*

The new regulations ‘forced’ actors to pay more attention to environmental consequences, both in overarching policy documents and in policy measures, and this boosted general environmental policy learning within Swedish agriculture, which also transferred onto the view on bioenergy (although concrete measures were inhibited due to CAP-regulations).

With regard to energy policy, top-down learning spurred by international environmental negotiations (e.g. the 1992 Rio Conference) is relevant for the
development of EPI. In Swedish energy policy, an environmental interest had already been awoken in the early 1990s, after the 1992 Rio Conference (Paper I), and thus EPI was already visible when entering the EU, where the development of EPI took a little bit longer. Although the EU energy focus was directed towards international and internal environmental protection commitments during the 1990s, it was not until the early 2000s that visible environmentally motivated measures started to materialise, although they were still tightly tied to supply security (Paper III). Similarly, the Swedish 2009 Climate bill built partly on scientific data from the IPCC, which also inspired EU climate policy (Papers II, III). Thus, the main sources of inspiration in energy policy on both the EU and the national level have been international environmental and climate change discussions. EU energy policy has still affected Swedish energy policy in other ways, especially during the last decade. For example, Swedish energy policy documents are highly influenced by EU aims regarding climate change and security of supply (Paper I), or as expressed in the National Renewable Energy Action Plan for Sweden:

*The Swedish energy policy is based on the same keystones as the cooperation on energy within the EU and aims to reconcile sustainability, competitiveness and security of supply (Swedish Government, 2010, p. 3).*

The increased harmonisation between EU and Swedish policy is also visible in the bioenergy debate, where the framing of bioenergy today is almost identical on all three policy levels (Table 5.1.), although with slightly different foci, and for which the global debate on climate change and bioenergy have played a significant role. An important sign of this top-down learning is provided by the sustainability criteria for biofuels, which now have been implemented in Swedish policy (Government bill 2009/10:64). Top-down learning is also visible on the sub-national level, where the BFR has moved from focusing on cellulose ethanol and biodiesel to a more diversified renewable energy interest in step with the international debate and new EU and Swedish regulations:

*Both national and EU-regulations define what is and is not environmentally friendly; what is regarded a “green car” and a “sustainable fuel”, for example, is to a large extent guided by national and EU definitions (Paper IV).*

While keeping the focus on renewable energy from local sources, the BFR now also promotes different types of renewable energy sources (such as biogas). This implies that the more ‘mature’ view on renewable energy sources has spread to the sub-national level, mainly driven by the implementation of new regulations.
Regarding bottom-up influence, it is indicated in Paper IV that personal contacts between leading BFR actors and leading municipal and national politicians may have been important in the starting-up phase of the BFR, and also may have influenced the initial Swedish focus on ethanol as the main alternative renewable transport fuel. However, according to my interviewees the main influence regarding bioenergy development on the sub-national level in this case is top-down political measures, regulations, long-term goals and financial opportunities. Thus, Paper IV shows that the increasing EU-interest in renewable energy provides long-term time frames and spurs the interest in sub-national bioenergy development in the eyes of local politicians and regional companies. Furthermore, the sub-national study shows that EU-funding, as well as national funding plays an important role for the sub-national development of bioenergy related projects.

This implies that different levels indeed do learn from each other, but that the learning flow is mainly top-down-generated. Learning in terms of general environmental knowledge on climate change, and the pros and cons with bioenergy use, but also instrumental knowledge spreads between levels. The learning flow is visible firstly in terms of a harmonisation of the framing of bioenergy across levels over time (see also Table 5.1.), and secondly in the fact that sub-national actors have developed the skills of picking up what works when applying for EU and national funding for projects (Paper IV).

It is, however, difficult to determine how much of this top-down ‘learning’ actually is steered by goals and rules rather than by knowledge and ideas: ‘soft governance’ (e.g. through economic incentives, guidelines etc) is also governance. The increased influence by EU policy in the area of bioenergy can partly be explained by the strengthening of the EU energy policy. During the 2000s, the EU has moved from indicative renewable energy targets for Member States to binding renewable energy targets, which of course have direct implications for Swedish energy policy in general and bioenergy policy in particular. Similarly, the fluctuations in energy crop planting patterns within Swedish agriculture are tightly tied to the level of financial support for these crops within CAP. Thus, the identified policy frame changes may also be a result of implementation and rule adjustment rather than of learning. As mentioned briefly in Chapter three, the Europeanization literature would provide other perspectives on this scenario, explaining the domestic impact of EU policy mainly through incremental change which affects national level policy and its outcomes, as well as the administrative structures and the negotiations foregoing policy change (e.g. Héritier et al. 2001a, 2001b). According to the Europeanization literature, an EU induced domestic policy change is likely in those cases when there is a misfit between EU policy and national policies, and adaptation to EU policy can thus be viewed more or less as a type of steering instrument, rather than as a learning process (see e.g. Jordan and Liefferink, 2006).
However, in this thesis, clear conditions for when learning can be said to have taken place or not have been given, and adaptation to EU policy also qualifies as (instrumental and/or rhetorical) learning under these conditions. Thus, can we say that ‘policy learning’ has actually taken place? Well – according to the criteria in this thesis, (environmental) policy learning can be identified as environmental objectives are now visible both in policy rhetoric and in motivations for policy measures on all policy levels: learning is both instrumental and rhetorical (see Table 3.2). Further, the ‘learning’ is indicated to be of a top-down type as, for example, environmental criteria for biofuels were first instigated on the EU level and the two other levels adjusted to the EU criteria. However – the ‘big test’ for whether or not actual learning has taken place is the development over time. The future will show whether or not the environmental criteria will be used when formulating future EU and Swedish policy measures and how the sub-national level will adjust to these criteria. For now, it is sufficient to conclude that the criteria for policy learning set up in this thesis are fulfilled – and that implementation of regulations and concrete policy measures are an effective way to spread both instrumental and rhetorical/political ‘knowledge’ across levels – which, indeed, can be viewed as a form of learning.

**How does EPI in one issue travel between different sectors over time?**

The scopes of environmentally motivated strategies are limited when EPI only takes place in one relevant sector in a multi-sector issue (Paper III).

It is evident when studying the appended papers and Table 5.1 that the framing of bioenergy has differed between different sectors over time. Sometimes, EPI has materialised in one sector, but not the other. Other times, EPI has spread from one sector to the other, implying learning across sectors. It is argued below that both environment-sector and inter-sector coordination affect multi-sector EPI and that policy coherence has important implications for the outcomes of multi-sector EPI in bioenergy, both on single policy levels and on different levels. In addition, other political/institutional factors identified in Chapter three and in the appended papers, are discussed below.

Before 2003, bioenergy policy on the EU level was highly sectorised. Agricultural policy was recognised in energy policy, while the recognition within agricultural policy of energy policy goals was weak, and agricultural biomass production was mainly encouraged on set-aside land as a way to reduce surplus production. The lack of policy coherence between the two sectors meant that strive towards bioenergy within the energy sector, in a
way, was stalled by CAP. After 2003, with the CAP reform, the common environmental door-opener impersonated by ‘bioenergy-for-climate-change’ spread to both sectors, and EPI reached both the EU energy sector and the EU agricultural sector. This was beneficial for policy coherence in the area of bioenergy (Paper III) and this new policy coherence also had an effect on the Swedish level.

Swedish bioenergy policy was highly coherent in the years before the EU entry, when the need for an agricultural change-over towards market-adjustment, together with the need for to increase the Swedish supply of renewable energy in order to implement the decision to phase-out nuclear power plants, generated large-scale bioenergy research and development projects which spanned across sectors (Paper I). As shown in Paper II, the outcomes (in terms of agricultural energy crop cultivation and bioenergy growth) from Swedish bioenergy policy were much higher in the years before EU membership, when the coherence between energy and agriculture was significant. Renewable energy goals were in place and policy measures in implementing sectors were adjusted to these goals. However, although EPI was detectable within the energy sector, environmental learning was merely rhetorical within agriculture. Nevertheless, energy forest cultivation grants were promoted within agriculture on the basis of energy policy where environmental arguments were prominent, which indicates that environmental learning spread between sectors. Therefore:

*Environmental attention thus seemingly hold the potential to spread between sectors through related policy areas in multi-sectoral issues, wherefore both environment-sectoral coordination and inter-sectoral coordination – simultaneously or independently – seem to play a role for multi-sector EPI (Paper II).*

When joining the EU, Swedish energy policy remained under national control, but coordinative attempts were constrained by the agricultural sector’s adherence to CAP regulations and the ensuing frame clash that occurred. After the 2003 CAP reform, however, the energy and agricultural policy areas are more in step on an EU level, and this is also visible within a renewed interest in energy crop cultivation in Sweden, and in terms of outcomes on the national and sub-national level (Papers II, III, IV). Papers I and II also showed that policy coherence and concrete policy goals and/or policy measures are highly important for stimulating outcomes from EPI in multi-sectoral issues. Therefore, it might not be a coincidence that the Biofuel Region came into being in 2003. Of course, the reasons why the BFR started in the particular region of Västerbotten and Västernorrland stem from both the preconditions for biomass and bioenergy production within the region, and the presence of engaged individuals in the area. However, my interviewees also emphasise the importance of long-term policy goals and
availability of financial support for the initialisation of, and development within, the BFR (Paper IV).

This thesis indicates that EPI has grown stronger within European bioenergy policy during the period studied. This has also led to significantly more coherent bioenergy policies in energy and agricultural policy at the European level. From a multi-level perspective, this is the most important development with regard to the possibilities for member states to promote EPI in their bioenergy policies, at least in the Swedish case. Thus, it is relevant to make sure that policies in multi-sector areas are coherent, both across sectors and levels if EU politicians are seriously interested in implementing their goals, in this case the renewable energy goal. It is also important that policymakers implement long-term goals, financial instruments and other types of concrete policy measures if actors on the national and sub-national level are to invest in renewable energy production.

As discussed in Chapter three, Meijers and Stead (2004:7) and Halpert (1982) hold that the likelihood of policy coordination increases when similar framing of a policy issue exists in different sectors; and when contextual factors allow for a decentralised, informal policy process where different sectors see the need to communicate with each other. Furthermore, according to Peters (1998), the likelihood of policy coordination increases when professional networks exist, which interact repeatedly e.g. around specific issues. Similarly, Nilsson and Eckerberg (2009, p. 166) identify participant’s trust in that they benefit from cooperation; development of trust and joint-problem perceptions; alignment of reframing with short-term sector interests; and strong political leadership as important factors for cognitive EPI. These factors are confirmed to be relevant for multi-sector EPI in this study. In Paper II, factors such as open actor access to policymaking, the use of environment-related knowledge, monitoring mechanisms and coordination, together with external events such as international debate, were found to be relevant for EPI within Swedish bioenergy policy. On the EU-level, Paper III points out the frequent discussions between different DG’s within the interservice consultation as an important platform for promoting different issues and for cross-sectoral interaction, especially since there is a need to reach consensus within commission statements. Furthermore, the common increased relevance of climate change has strengthened policy coherence in recent years.

On the Swedish level, similar views on the need for renewable energy increased policy coherence regarding bioenergy in energy and agriculture 1990-1995 (Paper I). This study thus shows that previous findings on institutional and political factors that have an impact on EPI (organisational features; policymaking procedures, where policy coordination/coherence is especially important; power structures; and the use of knowledge in assessment processes) (see e.g. Lenschow and Jordan, 2010), are also...
relevant in the case of multi-sector EPI. However, the most important difference between multi-sector EPI and single-sector EPI is that environmental knowledge has the ability to spread between different sectors through inter-sector interaction and/or coordination in multi-sector issues, and that similar framing in the significant sectors of a multi-sector issue is conducive for policy coherence, and also for EPI. Thus, in multi-sector issues, it is not only environment-sector coordination which plays a role for policy development of EPI, but also inter-sector coordination within certain issues. No previous study has pointed out the relevance of inter-sector coordination for EPI in multi-sector issues before. However, this coordination is highly important, especially considering that the scopes of environmental strategies are limited when EPI only takes place in one relevant sector within a multi-sector issue (see Paper I, II, III). For example, common environmental door-openers such as climate change are effective in promoting multi-sector EPI, which in turn has an effect on the policy coherence between sectors (Paper III).

Bioenergy – a green saviour, a dead end or just a small step on the way?

During the studied period, the policy debate around bioenergy has moved from the search for ethanol as the ‘One-and-only’ replacement for gasoline, to a realisation that a multitude of different green solutions are required in order to increase the sustainability of the EU energy supply. This is clearly demonstrated within the Biofuel Region, where this development is highly visible when comparing the initial discussion, in 2003, with the discussion today (Paper IV). Furthermore, the EU has recently implemented sustainability criteria for biofuels that are expected to have a significant impact on biofuels development on the national and sub-national levels and which illustrate a new, more complex view on bioenergy. Already, a move towards biogas investment is visible, both within the BFR and in Sweden, and the previously uncontested focus on ethanol now faces serious competition from biogas and electricity/hybrid cars when the new criteria for ‘green cars’ are discussed. It is, however, important to remember that the Swedish interest in the area of bioenergy was initiated by security and economic issues in the wake of the 1970’s oil crises (Paper I). Similarly, the increasing activity in the area of environmental (or, at least, climate change) integration over the last five years in European bioenergy policy have been spurred forward by being accompanied by economic or security aims. This, in turn, gives rise to the political will to implement powerful policy measures. On the other hand, this raises questions about the extent to which environmental aims are actually driving the process forward, or whether other issues will be prioritised when goal conflicts arise.
This illustrates what a complex area EPI is to study. When studying the EPI process on the EU, national and sub-national levels, bioenergy policy – despite its characteristics as a renewable energy source – has so far been signified mainly by weak EPI: environmental issues are (at best) weighed in together with other factors in policy decisions, and are indeed followed by policy measures to realise policy goals. However, and quite unsurprisingly, an anthropocentric, rather than an ecocentric, holistic worldview, dominates discussions and the priorities are to achieve economic growth and to secure the energy supply while also fulfilling the environmental ambitions. When revisiting the appended papers, it is clear that this predominating weak EPI tends to lead to a ‘jumping’ environmental focus, which often needs argumentative ‘friends’ to succeed – and when these ‘friends’ are gone (as in Sweden after the 1970s oil crises and after nuclear power plants had been built), environmental arguments tend to fade. Today, although the environmental benefits from bioenergy production and use are highly debated, bioenergy keeps being promoted on environmental grounds, mainly with regard to greenhouse gas emission reduction. This is influenced by the sustainability criteria which comprises biodiversity and GHG emissions, but is also influenced by security arguments. Simultaneously, the ethical justification for western production of bioenergy in poorer parts of the world, including risks for increased food shortage and poverty are being debated in the ‘food versus fuel’ discussion (e.g. Earley and McKeown, 2009; Mitchell, 2008; Baffes and Haniotis, 2010; Goettemoeller and Goettemoeller, 2007; Inderwildi and King, 2009), although no international consensus has yet been reached (Urbanchuk, 2008). For example, the Swedish Society for Nature Conservation (SSNC) holds that, apart from locally produced biogas, sugar cane ethanol is the best fuel option that exists today from a climate point of view, when compared to oil and gasoline, and is preferable to corn and wheat based ethanol (which still is preferable to oil and gasoline). However, they emphasise the need for environmental and social criteria for ethanol production (SSNC, 2011). At the same time, nuclear power is becoming increasingly popular amongst European (and Swedish) politicians with reference to the non-fossil energy provided by such solutions (Papers II and III). At the same time, the EU has moved from focusing on EPI to focusing on the three-tiered concept of sustainable development in the Lisbon Treaty, which includes a built-in conflict between social, economic and ecological sustainability. This, combined with the complete dominance of climate change within the environmental debate, increases the risk that EPI does not lead to its initial intentions. As stated in Paper III:
the study on EPI in EU bioenergy policy shows that we risk focusing on the win-win opportunities of combining different (economic, social, ecological) goals, while overlooking potential environmental consequences from renewable energy use (Paper III)

Concluding discussion: Results, theoretical insights and future research
In the introduction, I asked whether or not the EU’s framing of bioenergy is parallel to the Swedish (national and sub-national) framing of the issue; whether this has changed over time (and, if so, how); and in what way this frame compliance/frame clash shapes the prospects of promoting EPI in Swedish bioenergy policy and on the sub-national level. In Chapter three, I added the question concerning the role the EU plays for sub-national actions in terms of bioenergy and EPI, and if bioenergy policy is a case of hollowing-out of the state. This study shows that the framing of bioenergy has not been parallel on the different levels studied, especially not during the first years of the Swedish EU-membership, and that this frame clash had a significant impact on the possibility for Sweden to expand the renewable energy goal in energy sector policy to apply to the agricultural sector. However, in recent years, the common interest in coming to terms with climate change combined with an increased interest in supply security has led to a more coherent framing of bioenergy across all three levels, and to more coherent policies between the studied sectors regarding bioenergy. This new frame compliance means that policies are now moving in the same direction; that long-term goals are set and followed-up; and that new policy regulations and instruments are implemented, which have had an impact on Swedish bioenergy policy; on agricultural bioenergy production in Sweden; and for the sub-national developments within the Biofuel Region. Furthermore, the case of the BFR shows that, despite the increase in the number of political/administrative levels following EU membership, the national level is not circumvented in the case of bioenergy development. Of course, EU regulations and goals set the long-term conditions which form an important basis for the sub-national level’s courage to invest in renewable energy development. However, the national level policies are still important, and sub-national level actors in the Biofuel Region do not experience a direct influence on EU-policy through new types of networks. Rather, EU and national political and financial support play an important role for sub-national bioenergy development. This indicates that in the case of bioenergy, Rhodes (2000) theory of more direct links between the sub-national and supra-national level do not hold, at least not for the development within the BFR. However, the BFR is still quite a young project, and many of the informants expressed thoughts regarding the need to improve the contacts
with the EU-level, which means that the role of the national level may decrease in the future. Nevertheless, although EU-regulations do indeed set the broad conditions also for sub-national bioenergy development, the national level continues to be important. Hence, Eckerberg and Joas’ (2004, see also Nyqvist, 2008) claim that the national level still is relevant for policymaking conditions at the local level seems more in line with the current development within EU, Sweden and the BFR: the state has not been hollowed out in the case of bioenergy policy.

So, how does EPI in a multi-sector issue (bioenergy) travel between different sectors? According to this study, EPI often needs a little help from joint problem perceptions in the different sectors to travel across sectors. Thus, just as in single-sector EPI, environmental issues require alignment with sector specific problem perceptions in order to become integrated into sector policy in multi-sector issues such as bioenergy. In previous studies of single-sector EPI, integration has been noted to occur mainly through environment-sector coordination. However, this study shows that inter-sector policy coordination can also induce EPI in multi-sector issues. In this process, common environmental door openers (such as climate change) play an important role for the development of joint problem perceptions, and when joint problem perception occurs in specific issues, this can induce issue-specific EPI across sectors. This represents the main difference between single-sector EPI and multi-sector EPI identified here. Thus, in multi-sector EPI, not only environment-sector coordination but also inter-sector policy coordination is important for the EPI process as such. Another important aspect to emphasise is that policy coherence between sectors is highly important for the outcomes from EPI related policy goals in multi-sector issues.

How does EPI in a multi-level issue (bioenergy) travel between different levels of government? According to this study, EPI is mainly a top-down process, but not necessarily only from the EU-level and down. Instead, international environmental and climate change discussions are highly relevant for the development of EPI in bioenergy. This international influence was visible simultaneously on both the EU-level and the national level, but had the strongest impact in Swedish energy policy first (maybe partly because renewable energy suited both the need to strengthen the impact of the market in agriculture and the intention to phase out nuclear power). In addition, the EU regulations had a top-down effect on EPI in Swedish agricultural policy. This study also shows that the priorities are different on different levels: and therefore, that the focus of EPI related activities are different. Nevertheless, the ‘learning’ between levels in the case of bioenergy mainly results from international discussions and from implementation of policy goals and measures across levels.
Furthermore, the case of the BFR points our attention to one detail, which according to my informants has an effect on the sub-national – EU-level interactions and on the impact of EU-level economic instruments on the sub-national level: namely, the lack of competence on the sub-national level regarding applications for EU-funding:

*sub-national actors need to improve their skills (or EU- and national politicians need to simplify the application procedure) if such EPI instruments are to have full-scale impact (Paper IV).*

Thus, politicians on the EU level may reframe their policies and strategies towards environmental policy integration, but if sub-national actors find the grant application procedure too complicated, the EPI instruments still risks falling short of reaching the intended results. This implies two main things: firstly, that future EPI research needs to pay more attention to the multi-sector and multi-level interplay of different issues and, secondly, that more attention needs to be given to the results from EPI by analysing also the outcomes from implemented policies. Research which focuses on only one sector or one political/administrative level at a time risks missing both the interplay between policies and the outcomes from EPI.

*Is there policy learning over time, indicating EPI in bioenergy policy, and what factors can be identified as important for multi-sector/multi-level EPI in bioenergy?* This study shows the importance of long-term goals and concrete policy measures to follow-up these objectives for the outcomes of renewable energy ventures. On the sub-national level, however, also firebrands are important for the development, and the importance of leadership has also been pointed out in previous EPI studies (Nilsson and Eckerberg, 2007). Paper II shows that open actor access to policymaking; use of environment-related knowledge; monitoring mechanisms; and environment-sectoral and inter-sectoral coordination are important for multi-sector EPI. Although this study thus confirms previous research regarding factors important for EPI in single-sector issues, it is important to remember that in multi-sector issues the interplay between sectors has implications both for the EPI-process as such and for the outcomes of EPI driven policy activities. The conclusions regarding the need for monitoring mechanisms such as concrete policy goals and measures may also hold for other types of mainstreaming activities within policymaking. It is not enough that politicians reframe their policies towards mainstreaming concepts such as gender, disability or environment. If nothing is done to follow up what happens in practice on lower political/administrative levels, the declarations will remain – declarations.

This study has also shown that EPI is a complex concept, which allows for many different interpretations of the meaning of the ‘E’ and the ‘I’. In future
EPI research, it is thus relevant to ask: what is integrated, and where does it lead us? In the energy debate, the focus on integrating climate change has led many politicians to promote nuclear power as a quick-fix for a fossil-free energy supply. Another aspect of different interpretations of the ‘E’ in bioenergy is visible in the food versus fuel debate, which contains both social and environmental aspects of the biofuels policy, and where no international consensus has yet been reached. It is, however, relevant to point out that the view on bioenergy as inherently environmentally friendly has been questioned as society has learned more about, for example, the consequences of large-scale production and use of bioenergy. The sustainability criteria for biofuels is a first attempt to come to terms with this discussion, and sustainability criteria for biomass are to be launched in the near future.

Another important aspect of EPI identified here is the fact that the environmental framing often needs ‘help’ from other aspects, such as security or growth, to be taken seriously by politicians. The need for alignment of reframing with short-term sector interests was also noted by Nilsson and Eckerberg (2007) as an important factor for cognitive EPI. However, when attempting to ‘marry’ different goals, environmental aspects risks not being prioritised when goal conflicts arise. In general, the type of EPI identified in this study is of the ‘weak’ kind. Within bioenergy, the environment is considered on a par with other issues, but is not prioritised. Rather, economic growth is still the overarching objective on all the policy levels studied. This confirms Baker’s (2007) conclusion that the EU environmental policy is signified by ecological modernisation rather than by sustainable development. However, such a trade-off is inherent within the three-tiered sustainable development concept, in which a balance is to be found between the social, economic and ecological parts. Initially, environmental policy integration was established as a means to achieve sustainable development (WCED 1987, p. 314), but when implemented on the EU-level, focus lay on integrating environmental protection aspects in other policy sectors “in particular with a view to promoting sustainable development” (Article 6 of the European Treaty, OJ, 2002). Today, focus is more directed towards environmental protection “in accordance with the principle of sustainable development” (OJ, 2007, p.10). Sustainable development has a strong anthropocentric focus, and the equal weight of the concepts’ three legs, means that it is impossible to unite the achievement of sustainable development with strong EPI, where the environment is prioritised in a more or less ecocentric manner. This has consequences for what can be achieved with the EPI concept today. In bioenergy, policy learning over time indicates EPI in all studied sectors and on all studied levels, which, for example has led to the implementation of sustainability criteria for biofuels. However, the fact that the EPI in bioenergy is of the weak kind means that, in the end, focus may not be on finding the most
environmentally friendly energy source, but on finding the energy source which is most competitive on the market or which can help to ensure a secure energy supply within the EU, in Sweden, or in the BFR (and still count as EPI).

Thus, in future research, it is relevant to specify further what we measure when we examine EPI; what ‘environment’ we are integrating; and to what extent ecological sustainability is improved by EPI. It is important to pay attention to the fact that we are able only to integrate the available environmental knowledge. Something that is environmentally benign today may be viewed as environmentally detrimental tomorrow; the EPI concept is dynamic – it changes with increasing knowledge. Therefore, EPI is about finding ways to integrate the latest environmental knowledge into policymaking, and to be prepared to reassess political standpoints on the basis of new aspects. Let me finalise this study with these words. I hope that my study has shown that EPI may be more complex than what may first meet the eye, and that studies of EPI must take these complexities into account – but that there are indeed ways of overcoming these complexities, through long-term goals and policy coherence across sectors and levels; to protect the bare necessities of life.
Svensk sammanfattning


Avhandlingen fokuserar på det – idag mycket omdebatterade – ämnet bioenergipolitik, som analyseras ur ett miljöintegreringsperspektiv på tre politiska/administrativa nivåer (EU, nationell, lokal/regional) och i två sektorer (energi, jordbruk). Bioenergi är omdiskuterat, både i termer av ”miljö” (hur miljövänligt är bioenergi egentligen?), och i termer av ”integrering” (vilken roll bör miljöfrågor spela för bioenergipolicy på olika nivåer?). Genom att studera den komplexa bioenergifrågan önskar avhandlingen bidra med en ny, mer komplekst och holistisk bild av miljöintegreringsprocessen än vad som har presenterats i tidigare forskning.

I det första kapitlet formulerades avhandlingens syfte: att analysera miljöintegreringsprocessen i en mångsektoriell fråga, med ett flernivåperspektiv, över tid. Teoretiskt är ambitionen att utveckla kunskapen kring mångsektoriell och flernivåmiljöintegrering. Empiriskt är ambitionen att studera vilken roll miljö spelar inom svensk och europeisk bioenergipolicy; att studera en och samma fråga över två sektorer och tre nivåer; samt att spegla en fråga där såväl ”miljö” som ”integrering” är omstritt för att bidra till debatten kring stark/svag miljöintegrering. Fyra forskningsfrågor med tillhörande underfrågor formulerades också:

1) **Hur kan miljöintegrering upptäckas och ”mätas”, och hur framställs miljöintegrering i policydokument?**

2) **Hur sprids miljöintegrering i en mångsektoriell fråga (bioenergi) mellan olika sektorer?**

3) **Hur sprids miljöintegrering i en flernivåfråga (bioenergi) mellan olika styrningsnivåer?**

4) **Kan policylärande, som indikerar miljöintegrering i bioenergipolicy, upptäckas över tid och vilka faktorer kan identifieras som viktiga för mångsektoriell/flernivåmiljöintegrering i bioenergi?**

I kapitel två presenterades kontexten kring miljöintegrering inom forskning och policy, vilket visade att det finns en kunskapsbrist inom forskningen kring miljöintegrering när det gäller månsektoriella och flernivåfrågor. Vidare presenterades bioenergipolitikens kontext, och bioenergi presenterades som en förnyelsebar energikälla av växande betydelse inom EU, omfattande månsektor-, flernivå-, och omdiskuterad ”multi-E” (dvs olika uppfattningar om miljöns roll inom, och påverkan av, bioenergi)-karaktistik. I kapitel tre presenterades avhandlingens analytiska ramverk. Ett kognitivt synsätt på miljöintegrering antogs (där miljöintegrering ses som en lärandeprocess), även om också såväl ett institutionellt perspektiv (där miljöintegrering främst ses om ett policykoordineringsproblem), som ett politiskt perspektiv (där miljöintegrering främst handlar om politisk konflikt och lobbyism) på miljöintegrering erkändes som relevanta för analysen. Här förklarades vidare hur det kognitiva perspektivet behandlas och analyseras i avhandlingen: genom att spåra policylärande i formuleringar/ändrade synsätt (reframing) inom policy mot ett inkorporerande och miljöobjektiv (aspirationer, mål och krav) i policyretorik och praktik över tid.

Flernivåanalysen av miljöintegrering begränsades till jämförelse mellan policydokument och intervjuutskrifter på olika nivåer för att upptäcka policylärande mellan nivåer och undersöka huruvida miljöintegrering ser olika ut på olika nivåer samt hur olika nivåer påverkar varandra. Olika sätt att se på såväl ”miljö” som ”integrering” inom begreppet miljöintegrering presenterades och användes som definitioner av svag och stark miljöintegrering. Den svaga miljöintegreringen ser på ”miljö” inom ramen för en antropocentrisk världssyn, som sätter människan i centrum. Målet är att kombinera tillväxt med miljöhänsyn. När det gäller ”integrering” är det tillräckligt för svag miljöintegrering att miljö beaktas i sektorspolitiken, sida vid sida med andra typer av frågor. Den starka miljöintegreringen ser på
"miljö" inom ramen för en ekocentrisk världssyn, som sätter naturen i centrum. Målet är att uppnå ekologiskt hållbar utveckling. När det gäller ”integrering” kräver stark miljöintegrering att miljön principiellt och konsekvent prioriteras i sektorspolitiken. Vidare definierades termen ”miljö” som integrering av kort- och långsiktiga miljömässiga objektiv såsom *miljömässiga aspirationer, mål och krav* inom sektorspolitik och politiska och institutionella faktorer av relevans för miljöintegrering enligt tidigare forskning påvisades. I kapitel fyra presenterades forskningsdesignen, som i korthet kan beskrivas som en fallstudie, som inrymmer jämförelser inom fallet (mellan sektorer, nivåer och över tid). Efter detta presenterades avhandlingens metodologiska överväganden och ramverket för att upptäcka policyramar (genom tematisk idéanalys kompletterad av semi-strukturerade intervjuer) utarbetades.

I kapitel fem diskuterades avhandlingens slutsatser, vilka bygger på empiri från de fyra uppsatser som finns bifogade, och en jämförelse dem emellan. Vid en parallellgranskning av de fyra bifogade uppsatserna framkommer det att sättet att se på bioenergi skiljer sig mellan de olika studerade nivåerna (särskilt tydlig är denna skillnad under den första perioden av svenskt EU-medlemskap) och att denna krock mellan synsätt hade en signifikant påverkan på Sveriges möjligheter att sprida sitt mål för förnyelsebar energi inom energisektorn vidare även till jordbruksektorn. Dock har de senaste årens gemensamma intresse av att komma tillrätta med klimatförändringen kombinerat med ett ökande intresse av att säkra tillgången på energi lett till en mer samstämmig syn på bioenergi på alla tre nivåer och också till mer överensstämmande policies mellan de studerade sektorerna när det gäller bioenergi. Detta betyder att policies nu drar åt samma håll, att långsiktiga mål ställs upp och följs upp, och att nya policyregleringar och instrument implementeras, vilket har haft en effekt på svensk bioenergipolitik, på produktionen av svensk jordbruksbaserad bioenergi och för den lokala/regionala utvecklingen inom Biofuel Region. Avhandlingen visar också att den nationella nivån, trots flernivåstyrningsforskningens teori om motsatsen, fortfarande spelar en viktig roll inom bioenergipolitiken även om EU-regleringar idag också har en direkt påverkan på villkoren för lokal/regional bioenergiproduktion (men påverkan går, än så länge, endast åt ett håll – från EU och neråt). Dock finns fortfarande vissa hinder för att EU-initierade ekonomiska instrument ska få fullt genomslag: det är krångligt att söka EU-medel, och det saknas ofta kompetens för detta på lokal/regional nivå.

Så, hur sprids miljöintegrering i en mångsektoriell fråga (bioenergi) mellan olika sektorer? Enligt denna studie behöver miljöintegrering ofta lite hjälp från gemensamma problemuppfattningar inom de olika sektorerna för att spridas över sektorsgränsar; miljö behöver associeras med sektorsspecifika problem för att släppas in i, och integreras i, sektorspolitik.
Tidigare studier av miljöintegrering inom ensectorfrågor visar att det huvudsakligen är genom koordinering mellan miljödepartementet och sektorer som integrering åstadkoms. Den här studien visar dock att även koordinering mellan sektorer i mångsektoriella frågor kan främja miljöintegrering. I den processen är gemensamma miljömässiga dörröppnare (såsom till exempel klimatförändringen) viktiga för utvecklingen av gemensamma problemuppfattningar; och när sådana uppstår i specifika frågor kan detta främja sakfrågespecifik miljöintegrering som sprids mellan sektorer. Således är det inte endast koordinering mellan miljödepartementet och sektorer som är viktig för miljöintegrering utan även koordinering mellan sektorer. Likaledes spelar policykoherens mellan sektorer en viktig roll för resultatet från miljöintegreringsrelaterade policymål i månsektoriella frågor.


samtliga studerade nivåer. Detta betyder att det miljömässiga lärandet är såväl retoriskt som instrumentellt, vilket innebär att de kriterier som ställdes upp för att påvisa policylärande som indikerar miljöintegrering är uppfyllda. Avhandlingen påvisar samtidigt vitken av långsiktiga mål och konkreta policyåtgärder för att uppnå reella resultat när det gäller uppsatta mål för förnyelsebar energi. Detta gäller även generellt för andra typer av hänsynstaganden inom policyprocessen: även om koncept som jämställdhet, funktionshinder eller miljö finns med i policyretoriken och i politiska uttalanden på högre nivåer krävs det uppföljning kring vad som händer i praktiken eller på lägre styrningsnivåer om inte de politiska deklarationerna ska förbli just uttalanden.


energitillgången inom EU, Sverige, eller BFR, istället för att hitta den mest miljövänliga energikällan (och fortfarande räknas som miljöintegrering). I framtida forskning bör vi därför vidare specificera vad vi mäter när vi studerar miljöintegrering: vilken ”miljö” är det vi integrerar; och i vilken utsträckning förbättras den ekologiska hållbarheten av miljöintegrering?

Vidare är det viktigt att komma ihåg att vi endast kan integrera den tillgängliga miljömässiga kunskapen. Något som är bra för miljön idag, kan ses som dåligt för miljön imorgon; miljöintegreringskonceptet är dynamiskt – det förändras med ökande kunskap. Därför handlar miljöintegrering om att hitta vägar för att integrera den senaste miljömässiga kunskapen i formulering och genomförande av policy, och om att vara beredd på att omvärdera politiska ståndpunkter på basis av nya aspekter. Slutligen hoppas jag att min avhandling har visat att miljöintegrering är mer komplext än det verkar vid första anblicken, och att framtida forskning måste ta med denna komplexitet i beräkningen – men att det finns sätt att komma runt denna komplexitet, framförallt genom långsiktiga mål och överensstämmande policys i olika sektorer och på olika nivåer.
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