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journal homepage: [www.elsevier.com/locate/enpol](http://www.elsevier.com/locate/enpol)

# New energy strategies in the Swedish pulp and paper industry—The role of national and EU climate and energy policies

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## ARTICLE INFO

### Article history:

Received 14 April 2010

Accepted 10 December 2010

Available online 20 January 2011

### Keywords:

Pulp and paper industry

Climate policy

Investments

## ABSTRACT

The Swedish pulp and paper industry has gone through a strategic change in its approach to electricity production and consumption over the past decade. This paper documents this reorientation, which includes increased on-site electricity production, investments and investment plans for wind power, and new partnerships concerning investments in electricity production assets. We also assess the extent to which these changes can be attributed to key energy and climate policies. Our analysis shows that this strategic reorientation has been driven by changes in the underlying economic conditions for the pulp and paper industry, in particular increases in the price of electricity following the Swedish energy market reform in 1996, and the introduction of the EU ETS. The scheme for tradable renewable electricity certificates, on the other hand, has provided a new source of income. While these market-based signals and responses are the most dominant drivers of strategic change, cognitive changes in the pulp and paper industry have also played a role in the strategic reorientation. The cognitive changes concerning the functioning of the electricity market, i.e. the pricing of electricity and influence of the EU ETS, have been particularly important in this regard.

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## 1. Introduction

The Swedish pulp and paper industry (PPI) is changing the way in which it addresses electricity supply and consumption. This is evidenced by investments already made, plans for future investments, and changes in electricity production and use, as well as a variety of organisational changes signifying this strategic reorientation. For example, in recent years substantial investments have been made in process-integrated electricity production, and ambitious investment plans for wind power have been announced. This represents a fundamental trend break entailing a reversal of the strategy dominant in the 1990s and early 2000s, which was to concentrate on the core business of pulp and paper production. In the 1990s, and in some cases earlier, the PPI divested many of its power assets, in particular hydropower, which was in the hands of the PPI for historic reasons since fall rights came with forest land ownership. Some nuclear power assets that had been acquired during the 1975–1985 expansion of nuclear power were also divested. The 1990s also saw a trend for on-site energy facilities, e.g., boilers and combined heat and power (CHP) units, to be outsourced to energy companies (Möllersten and Sandberg, 2004). Against this background the resurging interest in electricity-related

investments in recent years is interesting. The development has implications for the whole energy and power sectors since the PPI is such a large energy and biomass user.

This paper documents and describes the patterns of change in electricity production and consumption in the PPI. The extent to which these changes can be linked to and explained by changes in energy and climate policies is discussed. Understanding such processes of change is important in the context of evolving European and national energy and climate policies. Ambitions to reduce greenhouse gas emissions, and other policy goals, are bound to continue shaping this sector. A better understanding of the combined effects of policy on an export-oriented industry such as the Swedish PPI, and how it responds, can serve as important input for future policy-making.

The main period of study is 1998–2008. By 1998, the Swedish electricity market had become fully liberalised, a process that began in 1996 and included the opening of the generation and sale of electricity for competition (transmission remained a monopoly). 1998 also marked the introduction of an internationally agreed climate change mitigation policy through the Kyoto protocol of 1997. The general conditions in the market for pulp and paper products affect the profitability of the PPI and the willingness of companies to make investments, but this aspect is not analysed in detail. With the exception of the 2008–2009 economic downturn, the export prices of pulp and paper products and growth in production have been slow but stable for both of

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the main processes, mechanical and chemical pulping. Bearing in mind this stability, energy and climate policies and changes in the energy markets are likely to have played an important role in the recent reorientation. In the assessment of their influence we apply two complementary explanatory perspectives; the economic perspective, in which reorientation is assessed in the context of economic effects of policies; and the cognitive perspective, in which reorientation is assessed in the context of changes in perceptions and expectations. Although the main period of study is 1998–2008, the explanatory perspectives sometimes require us to go back further, not least because the PPI is capital intensive and characterised by long capital-asset cycles. In addition, important energy and climate policies were introduced before the main period of study.

We also discuss the origin of national policies and the influence of EU policy. Sweden became a member state of the EU in 1995. Given the general position of Sweden, as something of a frontrunner in EU climate and energy policy, it would be natural to expect that EU policy has a relatively weak influence. Yet, EU climate policy is often quoted as being the major new challenge facing industries such as the PPI. In the literature on Europeanisation, the relative influence of European versus national policy is often debated (Börzel and Risse, 2000; Jordan et al., 2004; Olsen, 2002). For example, the level of influence of the EU, and whether or how EU policy is implemented at the Member State level, as explained by the notions of ‘fit’ versus ‘misfit’, are central issues in this literature (Knill and Lenschow, 2005). However, such analyses often stop at the level of assessing the extent to which policies and instruments have been implemented and EU directives transposed. This stream of literature seldom attempts to go one step further and analyse in any great detail the outcome of EU policies in terms of changes to energy systems, markets and organisations.

Our analysis also complements the mainstream policy-analytical literature in the field of energy by studying the combined effects of various energy and climate policies. This approach was also applied in a paper by Johansson et al. (2007) focusing on policies in Sweden and their effects on energy efficiency in industry. The existing literature, however, generally focuses on the effects of single policies or policy instruments, such as feed-in tariffs or quota-based systems for renewable energy sources (RES), and energy efficiency policies. In the past few years, there has been particular interest in the potential effects of the EU emission trading scheme (ETS) on European industry, including the risk for carbon leakage (cf. CEC, 2007; European Parliament’s Temporary Committee on Climate Change, 2008; ITPS, 2004). However, the combined effect of several policies, operating at different levels in shaping the development of industrial sectors and sub-sectors is rarely studied. Nevertheless, this is the reality that sectoral actors experience and respond to. As a consequence, the processes by which, for example, companies and industrial sub-sectors, are ultimately shaped at the micro-level by the complex combinations of influences from different levels are poorly understood.

This paper examines the effects of a combination of energy and climate policies at European and national levels. The combined effects of policies are complex and somewhat ambiguous in the case of the PPI. On the one hand, energy and climate policies are seen as a considerable threat to the competitiveness of the PPI and other energy-intensive industries in Sweden and Europe. On the other hand, such policies also present new business opportunities for the PPI which has the advantage of using a renewable feedstock. The PPI has the opportunity to develop into biorefineries, producing not only pulp and paper, but also chemicals, solid and liquid biofuels and other wood-based materials (cf. Nyström and Cornland Deborah, 2003; Ådahl et al., 2006; Sathre and Gustavsson, 2009).

## 2. Analytical framework and material

We argue that there have been considerable changes regarding electricity production and consumption in the PPI in Sweden over the past 10 years. Section 4 documents and substantiates these changes as our dependent variable. The changes are described in two main dimensions that are central elements of the PPI. *The first dimension* concerns changes in terms of on- and off-site electricity production and end-use efficiency. It also includes recent and planned investments, acquisitions and strategic partnerships in terms of capital expenditure and amount of electric power. *The second dimension* concerns energy-related organisational changes. These changes may be observed within companies as well as in the relationships between companies in the PPI, and between companies in the PPI and other sectors (such as the power-production industry).

In Section 5 we seek to explain this reorientation and discuss the extent to which it can be attributed to energy and climate policies. Investment decisions concerning electricity production and energy efficiency are at the centre and important indicators of this reorientation. Such decisions involve complex processes that are shaped by many factors. While investment decisions are financial decisions, they are also often strategic decisions. Studies have shown that the higher the strategic character of the decision, the lower the level of procedural rationality of the decision-making process (Cooremans, 2009). Hence, strategic investments are often shaped not only by financial factors, but also by the perceptions and biases of key decision makers. This is likely to be the case in the recent reorientation in the PPI, where many of the investments already made or planned are of a strategic character. In order to explain this reorientation, we therefore apply two complementary explanatory perspectives; the economic perspective, in which reorientation is discussed in the context of economic effects of policies; and the cognitive perspective, in which reorientation is discussed in the context of changes in knowledge, perceptions and expectations. These explanatory perspectives are complementary but also interconnected. For example, changes in the economic conditions are likely to have cognitive effects and lead to changes in perceptions and expectations. Moreover, cognitive changes may lead to changes in perceptions about future economic conditions.

The first and central explanatory perspective, the economic perspective, relies on the basic assumption that financial factors determine investment decisions, i.e. that the pulp and paper companies are rational economic actors. The expectation is thus that the reorientation reflects an adaptation to energy and climate policies. These policies set the regulatory framework conditions and influence the PPI economically through market-based mechanisms. These market-based mechanisms are the creation or modification of markets, and can be exemplified by the use of environmental taxes and the creation of markets for emission permits and certificates. The market-based mechanism is often argued to be the strongest governance mechanism, and certainly the preferred one among many policy makers in both Sweden and the EU. Examining the reorientation from an economic perspective involves the identification of investment and business activities that appear as economically rational responses to opportunities created by policy. Such relationships may be revealed by examining and illustrating the economic effects of policies. The economically most relevant energy and climate policies were identified in the respondent interviews (described later in this section), and include the Swedish electricity market reform, the ETS, the scheme for tradable renewable electricity certificates (TRECs) and the Swedish programme for improving energy efficiency in industry (PFE). These energy and climate policies exert a direct and/or indirect influence on the PPI. The direct effects include additional

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