



# Industry- and company-level factors influencing the development of the forest energy business – insights from a Delphi Study

Satu Pätäri \*

*School of Business, Lappeenranta University of Technology, P.O. Box 20, FI-53851 Lappeenranta, Finland*

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## ABSTRACT

The global business environment of today requires industries to be increasingly agile in order to create added value. There is a particularly urgent need to innovate and redefine business models in the mature pulp and paper industry, which is continually announcing mill closures and reporting persistent profitability problems. This paper focuses on the emerging forest energy business, which appears to offer many novel opportunities for both the forest and the energy industry. We conducted a qualitative dissensus-based online Delphi study and carried out themed expert interviews in order to identify the main industry- and company-level factors that are most likely to influence the bioenergy sector, its value-creation potential and forest and energy companies' future roles in it. The Delphi technique proved to be a valuable research tool with which we were able to obtain comprehensive information on a subject that lacks historical and financial data, and yet requires input from many quarters. The results suggest that the complementary resources held by forest and energy companies make collaboration in the bioenergy business favorable. Moreover, the procurement and logistics of forest raw material appear to be key success factors in terms of yielding the most synergetic gains. Uncertainty about policy interventions nevertheless causes concern given their relatively rapid effect on the prospects of the bioenergy business.

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## 1. Introduction

In the current global business environment, industries need to be increasingly agile and willing to change in order to gain sustainable competitive advantage [1,2]. The need to innovate and redefine business models is especially urgent in the mature pulp and paper industry (PPI), with its constant mill closures and persistent profitability problems [3]. One of the most interesting future business opportunities in the PPI, which is addressed in this paper, concerns the processing of forest-based biomass into bioenergy or biofuels, which would potentially allow forest companies not merely to survive but to become competitive [4–6]. The knowledge and resources of the multiple actors in the evolving bioenergy chain will be needed in order to exploit this opportunity, however: the forest industry's access to biomass and its expertise in timber procurement and logistics, and of the know-how in the energy sector about producing energy from various raw-material bases and distributing it to the markets. There are also many external factors beyond the industries' control that could relatively quickly change the actors' willingness to tap into the emerging bioenergy business.

In other words, the setting for this research is the bioenergy sector, which is evolving at the interface between the forest and the energy industries (see Fig. 1). By way of theoretical background the paper considers the strategic challenges that currently confront mature, basic industries (forest and energy) in particular. It is suggested that pure cost-based strategies that have long been the tradition in the PPI no longer yield enough value. There is thus a strong need to find new sources of sustainable competitive advantage. The aim here is to assess the new business opportunities related to bioenergy production on both the industry and the

\* Tel.: +358 5 621 7241; fax: +358 5 621 7299.

E-mail address: satu.patari@lut.fi.

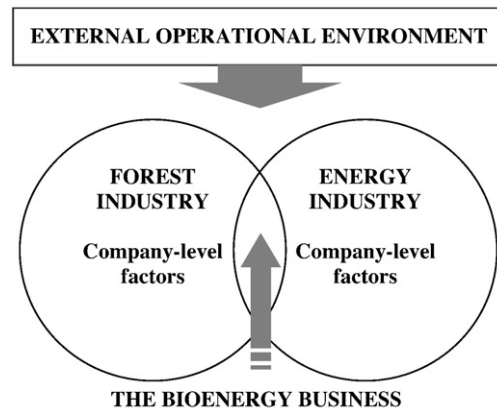


Fig. 1. The research focus.

company level. In order to do this we conducted a three-round dissensus-based online Delphi study and carried out themed expert interviews. The Delphi method turned out to be suitable for this research for several reasons. Most importantly, it made it possible to collect opinions from experts with a background in different industries. In sum, the primary objective here is to identify the main industry- and company-level factors that are most likely to influence the bioenergy sector and its value-creation potential, and the forest and energy companies' future roles in it.

The next two sections describe the theoretical background and discuss the challenges and new business opportunities that are arising at the interface of the forest and energy industries. [Section 4](#) gives an overview of the research design, and [Section 5](#) presents the results of the Delphi study. [Section 6](#) discusses the main findings and concludes the paper.

## 2. Value creation in basic mature industries – new prospects for the forest and energy industries?

All industries are faced with many strategic challenges in today's business environment, which is characterized by fast changes in customers, technologies and competition [1,2]. In the PPI in particular, which is known as a basic industry, these challenges are penetrating the industry structures and changing the current dynamics [7]. Many of these basic industries have long since passed the introduction and growth stages of their life cycles. As they mature they typically report slower growth and lower profitability rates, and as a result start to focus on selling products that have been considered commodity-like for a long time. In other words, cost efficiency becomes an important determinant of profitability at the mature stage [8,9].

Bush and Sinclair [8] question this assertion of cost efficiency as the primary source of competitive advantage however, and state that industries ought to incorporate customer-oriented aspects into their overall strategy because "mature industries often lack the conditions required for maintaining an absolute cost advantage" over long periods of time. In other words, a balance between a cost and a customer orientation is needed. Other authors as well as Bush and Sinclair [8] highlight the importance of customer orientation. For instance, Lähinen [10] who studied the woodworking industry, and Frandina and Rossi [11] who analyzed the PPI found that a sharper focus on customers and their needs had an advantageous influence on company performance. Fischer et al. [12] also support this finding in their study on manufacturers of basic industrial products. According to Thorp [6], Kimberly Clark and Georgia Pacific are examples of successful PPI companies that have carved a niche through the application of innovative, customer-focused strategies. The mainstream forest companies have been struggling with low prices, rising costs and global competition however, but have shown no willingness to innovate or to explore new business opportunities. Consequently, many authors and practitioners are currently emphasizing the need for a new definition of its business as the primary means of ensuring a successful future for the forest industry. The prevalent business models of transforming logs into multiple wood, pulp and paper products, which worked efficiently from the 1950s to the 1970s, are no longer operable [4,6,13].

The growing global interest in renewable energy has brought potentially fruitful opportunities for PPI companies to create new value-adding business by starting to produce bioenergy and biofuels in collaboration with the energy industry. At present the traditional pulp and paper mills are mainly restricted to producing cellulose-based outputs, even though the inputs to the mills are many and various. Added to this, the energy values of the inputs are underutilized in their current business models. If the conventional pulp mills are re-identified as forest biorefineries the industries will be able to take full advantage of the existing resources and the available raw material, and produce higher-value-added products that meet customer needs [4,6].

[Fig. 2](#) illustrates the value generated through traditional and novel business strategies [6,13,14]. The wider the horizontal line, the more profit potential is available in the model, and the higher the bar, the more difficult it is to implement it. The potential value-generation potential of pulp production, which is depicted at the bottom of the figure, is currently almost at its maximum. This is illustrated in the white area to the right of traditional pulp and paper production. In order to create more value therefore, forest companies must move upwards towards higher-value-added products that meet customer needs. These steps include taking advantage of the whole feedstock by co-producing energy together with pulp. The energy industry's role in the new business stems from its complementary knowledge of the downstream operations in the energy value chain [4]. Evolving traditional kraft pulp

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