Chapter 87
Value Creation with Wood-Based Energy Business Models

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ABSTRACT

Renewable energy sources are increasingly coming into use. This notably counts for non-food based biomass sources, including those producing wood-based energy. A firm that (re-)directs activities to this area can potentially create value. The external and internal environment of the firm sets the outline for the value creation potential. Important in the value creation process are dynamic capabilities to alter resource bases. The authors show this with an example in the mature Finnish pulp and paper industry. A Delphi study helps to identify the main industry- and company-level factors that influence the forest-based energy sector, its value-creation potential, and the future roles of forest and energy companies in it. The results of a study on a power plant in The Netherlands shows how the economic value creation for a specific firm can be assessed. The plant is designed to "vaporize" biomass input, in our case so-called "B-wood," to a bio-oil that can be used to generate Green Power. The economic value analysis draws upon a risk-oriented production unit positioning analysis that is modeled with multiple scenarios. The results show that innovative business models can fruitfully be identified with multiple experts in sophisticated Delphi rounds and dynamic resource-based approaches appear promising. The authors also find that bio-refinery production chains are economically feasible with relatively small production units with multiple applications. The chapter gives way to a management view that integrates resource-based and economic value perspectives on wood-based energy sources for firms. In that sense, it adds to the literature on value creation with innovative business models.

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1. INTRODUCTION

A combination of fear and hope, and not in the least rising energy prices, has given birth to a renewable energy sector that is readily becoming able to rival its fossil fuel counterpart. New business models are being explored, but not all of them seem to create value. Take for example wood-based energy. Traditionally, it was viewed as a by-product of production processes. The question has become, however: how can value be created with innovative business models in this area? This chapter offers a view that may help firms with their actual decision-making and it also brings academics a view on a timely topic.

The structure of this chapter is as follows. In section 1, the background of our study is provided. Literature on value creation with business models is treated in section 2. The research design is outlined in section 3. In section 4, a business identification perspective on wood-based energy is illustrated with a study on the Finnish Pulp and Paper Industry (PPI). In section 5, an economic value view is exemplified with a feasibility study on a wood-fed Dutch bio-oil plant. In section 6, our conclusions on value creation with wood-based energy are presented.

2. BACKGROUND

Many industries are confronted with structural changes. An example of this includes the forest industry, which is not mainly anymore about cutting wood, producing pulp and paper, reusing or doing away with the waste and planting trees. Another example is the waste industry, which deals with a lot more these days than separating waste, recycling the valuable parts and burning the rest. Lastly, today's energy sector does not just convert fossil fuels into a bit of usable power that is partly dissipated on its own turn. The forest industry, and especially the PPI, finds out about ways to utilize its resource stock more economically and to use by-products more profitably, the waste industry diversifies and multiplies its inputs and the energy sector shows up with increasingly efficient production processes and with an intensified focus on renewable energy. However, exploitation of the emergent business opportunities requires the knowledge and resources of multiple and diverse actors.

Adding to both Paays and Westerman (2008) and Pätäri and Westerman (2011), we focus on value creation in the bioenergy sector, which emerges at the interface between the forest, waste and energy industries. *Bioenergy* is renewable energy derived from biomass, here in particular from wood-based biomass. *Bioenergy products* include both bioenergy (e.g., heat and power) and biofuels (e.g., ethanol). This study explores innovative business models related to biomass-for-energy in terms of *what* they are, *how* forest, waste, and energy companies can exploit them and *how* their value creation can be assessed. The changes relating to bioenergy within competitive environments carry the potential for a radical transformation of industries that create opportunities to both new entrants and competitors (see Lei & Slocum, 2002). The emerging business challenges and opportunities can be identified through scanning the competitive landscape and the structural industry changes. This scan may serve as an input to create and renew the resource base of the firms involved in the bioenergy sector.

The investments identified to develop resource bases can be evaluated regarding their placement in the production chain and the business process, as well as in the internal and external environment. In the end, there is value creation if the present value of the expected stream of future cash flows that an investment provides to its owners and stakeholders is positive (Dorsman, et al., 2009). Bioenergy investment decisions are costly and subject to a high level of uncertainty with respect to future developments and economic value creation, since in the early stages of an industry there is a lack of information about the course of the

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