

## **The Green Economy – Emerging Green Business Models in the Danish Window Industry**

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### **Introduction**

The 'Green Economy' is increasingly referenced at the policy level (Andersen, 2009; OECD, 2011, UN 2011). However, the emergence, scope and business implications of such an economy are little analyzed. Traditionally, environmental sustainability has been considered a burden to business associated with extra costs (Kemp and Andersen, 2004, Andersen, 2009). Since the early 1990s there has been a slow but steady rise of proactive eco-innovation strategies in firms. It is only within the last decade however, that eco-innovation has been recognized as an important driver of economic development which has reached a level where we now talk about the emergence of new green business models.

The paper applies a 'dynamic capabilities' perspective (Teece, 1986, 2000, Langlois, 1992, 2002) to develop a dynamic theory of the greening of firms and markets with a focus on the emergence and design of green business models. Society benefits when eco-innovations successfully make their way into markets either via existing business or innovative start-ups. However, as Teece (2010) has emphasized the adoption of the right business model is essential for successful commercial innovations.

The paper focuses on the Danish window industry, an SME dominated industry forming part of the conservative construction sector. With buildings accounting for 32 percent of world energy consumption, it is a sector increasingly affected by the rising need to develop new energy efficient buildings or retrofitting existing ones (IEA, 2012). The analysis looks into the design of green business models in the sector, and how their search for new 'green profit' opportunities affects the way they organize their activities, processes and financials to deliver and capture both economic and environmental values. It is the relationships with other companies that surround the innovation activities that allow the company to capture value from the innovation.

### **Methodology**

The analysis is based on a qualitative analysis of data collected through a series of interviews, secondary data, standardization data and data from an energy labeling scheme for Danish windows. Peripheral information from related industries, noticeably the flat glass industry, is also included.

### **Results**

The analysis shows an uneven development of the firm-market greening as the green agenda has evolved over time among players in the chain and incentives to go green have emerged. The systemic development of eco-innovations in buildings is growing as new smart energy efficient solutions are pursued and which challenge existing business models. The analysis shows substantial change in the business models and the configuration of business relations, with leading companies taking on new more integrative roles; that is shifting from being window producers to becoming green building producers.

However, while the transaction costs to greening have sunk considerably with better information standards and more widespread green capabilities, the market for green windows remain challenged by users lacking information and knowledge. New value propositions and the successful communicating those to different kinds of customers is a key part of the emerging business models. The industrial dynamics observed indicates that we are witnessing a major structural change of the economic system indicating that the greening of the economy is likely to accelerate in the coming years.

The analysis contributes to a beginning understanding of the specificities of green economic evolution and hence to building eco-innovation theory. It may also inform us more fundamentally about the micro-processes of more definitive economic change which are normally only analyzed ex post.