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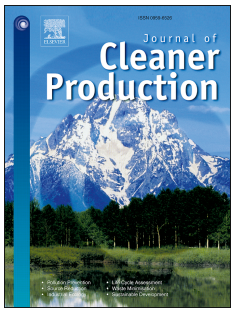

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Strategic collective system building to commercialize sustainability innovations

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Abstract

The implementation of innovative sustainability technologies often requires far-reaching changes of the macro environment in which the innovating firms operate. Strategic management literature demonstrates that the chances of a successful diffusion and adoption of an innovative technology in society are increased if the firms wanting to commercialize this technology collaborate in networks or industry clusters to build a favourable environment for their technology. However, the strategic management literature does not offer advice on how to strategically create this supportive external environment. We fill this gap with complementary insights from the technological innovation systems literature. We introduce the concept of strategic collective system building; this concept describes processes and activities that networks of actors can strategically engage in to collectively build a favourable environment for their innovative sustainability technology. Furthermore, we develop a strategy framework for collective system building. To underpin our theoretical analysis empirically, we have conducted a case study in the Dutch smart grid field. The resulting strategy framework consists of four key areas: technology development and optimization, market creation, socio-cultural changes and coordination. Each of these key strategic areas is composed of a set of system-building activities.

Keywords: System building; technological innovation systems; strategic collaboration; collective strategy; sustainability innovation

1. Introduction

Society-wide replacement of polluting technologies with alternative sustainability technologies enables consumers to maintain satisfying lifestyles without destroying the planet's ecological capacity for future generations. Therefore, sustainability technologies play an important role in sustainable development (Hargadon, 2010; Jansen, 2003; Nill and Kemp, 2009). Sustainability technologies are technologies which enable more efficient use of resources, less stress on the environment and even cleaning of the environment (Foxon and Pearson, 2008; Weaver et al., 2000). Many new technologies to solve or mitigate sustainability challenges have already been invented. However, their market implementation often fails – even if their performance is superior to incumbent technologies (Caniëls and Romijn, 2008). Actors who come up with radically new sustainability technologies find it difficult to further develop their solution and to launch it on the market, because competing established technologies are widely supported by the socio-technological regime within which they have evolved (Geels, 2002; Kemp et al., 1998). Moreover, the adoption of a new sustainability technology sometimes requires inconvenient changes in consumption patterns, without offering additional functionalities to the consumer (Hargadon, 2010; Jansen, 2003). To overcome these obstacles and to enable a wide diffusion of sustainability technologies, significant socio-cultural, economic and legislative changes are required (Kemp and Loorbach, 2003). The active engagement of a wide range of public and private actors is necessary to achieve these changes (Farla et al., 2012; van den Bergh et al., 2011). Among these actors, the driving forces of the transition process are often entrepreneurs and entrepreneurial managers[1] who develop and diffuse sustainability innovations (Hall et al., 2010; Teece, 2010). To increase the chances of success of their technological innovation, they can – in collective efforts – try to achieve changes in the macro environment that support the implementation and user acceptance of their technology (Van de Ven, 1993).

[1] The narrow definition of the term entrepreneur describes new entrants who have a vision on new business opportunities in new markets (start-ups); the broader definition includes 'entrepreneurial managers', which are employees of incumbent companies who diversify their business strategy to take advantage of new developments (Hekkert et al., 2007).