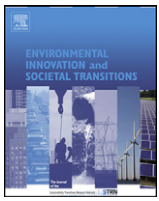
Environmental Innovation and Societal Transitions 5 (2012) 1–18

Contents lists available at SciVerse ScienceDirect

Environmental Innovation and Societal Transitions

journal homepage: www.elsevier.com/locate/eist



Anchoring of innovations: Assessing Dutch efforts to harvest energy from glasshouses

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ARTICLE INFO

Article history:
Received 25 April 2012
Received in revised form 9 October 2012
Accepted 9 October 2012
Available online 1 November 2012

Keywords:
Anchoring
Energy transition
Glasshouse horticulture
Niche–regime linking
System innovation

ABSTRACT

In the multi-level perspective (MLP), two key levels are socio-technical regimes and technological niches. The linking processes between these levels, however, are not well understood. We use the concept of anchoring as a starting point towards a theory of linking and distinguish three forms: technological, network and institutional anchoring. Our case study concerns attempts to reduce energy consumption in the Dutch glasshouse horticulture sector, consisting of a variety of alternative energy approaches. Distinguishing the three forms of anchoring appears to be useful for studying and understanding the interactions between novelty, niche and regime. The study reveals that 'hybrid actors' and 'hybrid forums' play a crucial role in bringing about various forms of anchoring. These findings are not only of analytical interest, but also relevant for practitioners who desire to induce system innovation to contribute to sustainability.

1. Introduction

The multi-level perspective (MLP) has become an important analytical tool for understanding processes of transition and system innovation (e.g. Geels, 2002, 2005; Berkhout et al., 2004; Geels and

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http://dx.doi.org/10.1016/j.eist.2012.10.006

Schot, 2007). In this perspective, niches are the breeding ground for radical innovations that, under influence of destabilisation of regimes and landscape factors, may start a transition process in a regime. The processes by which niches link up to a regime, however, are poorly understood (Smith, 2007).

Building on Loeber (2003), we propose the term *anchoring* as an analytical concept in this regard and distinguish three forms of anchoring, notably technological, institutional and network anchoring. Anchoring relates to the situation in which the new links are still vulnerable and might easily be broken again. Subsequently, we analyse the details of the three forms of anchoring in a case-study on the supply and production of energy in glasshouses.

In our conclusions, we discuss the usefulness of using the concept of anchoring for building a theory of linking. Our main goal is to present and test an analytical framework for more detailed future studies of linking. Based on our case study, we introduce *hybrid actors* who play an important role in the anchoring processes, much of which take place in what we call *hybrid forums*. Finally, we discuss which dynamics may transfer anchoring into durable links. Some of these dynamics have been identified in earlier work on sustainability transitions. What we add is that we relate these dynamics to the micro-processes of anchoring which makes it possible to study the role these dynamics play in linking processes as a sequence of different forms of anchoring.

2. Conceptualising anchoring

2.1. Understanding linking

The multi-level perspective has been convincingly used to describe, reconstruct and analyse historical processes of system innovation (e.g. Geels, 2002, 2006). The perspective suggests that radical innovation emerges from complex interactions between processes occurring at three levels: socio-technical regimes (the meso level), technological niches (the micro-level) and socio-technical landscapes (the macro-level). This perspective has been used effectively by innovation scholars to analyse historical processes of radical socio-technical change.

Given the time frame considered, such descriptions and analyses necessarily abstract from the messy dynamics that occur within and between projects and networks of actors that are involved in innovation processes. As a result, the processes by which developments at the niche level interact with those at the regime level and gradually shift dynamics in the direction of system innovation are not well understood. As Smith wrote (2007, p. 431):

> "... the precise relations between niche and regime still requires further analytical attention. Niche practices link up with regimes under stress, resolve bottlenecks and lead to reconfigurations. ... However, linkage is understood in the literature to be 'haphazard and coincidental'. [references to Geels, 2002, p. 29; Schot, 1998] We still do not have a theory of 'linking'."

Smith himself made an attempt at filling this theoretical void. One of his starting points is that he sees linking as a two-way influential process. MLP studies typically focus on how and under what conditions a niche influences a system (e.g. Geels, 2002, 2006). Smith, however, stresses that a regime also influences niches in the sense that sustainability problems in a regime have an important constituting effect upon niche creation (Smith, 2007, p. 436).

Furthermore, Smith demonstrates that linking rarely means that socio-technical practices from a niche are simply adopted in a regime (or vice versa) but that some form of translation, i.e. changes of these practices,[3] takes place to make this possible. His main argument is that "... a focus upon the translation of socio-technical practices between niche and regime will further help theory development. In addition to identifying opportunities for niche–regime connections, we need to understand the connecting processes how these reconfigure developments in niche and regime" (Smith, 2007, p.

[3] The term translation is also a central concept in Actor Network Theory (ANT). In ANT, 'translation' is the process by which the wilful objectives of one actor are transferred into other actors, who are thus recruited into the network around the primary actor (Callon et al., 1986). Smith acknowledges this (2007, note 6) and explicitly uses a different meaning of translation, notably changes in socio-technical practices. We follow Smith in using this meaning of the concept.