# The behavioral basis of policies fostering long-run transitions: Stakeholders, limited rationality and social context

CrossMark

Ardjan Gazheli [a,\*], Miklós Antal [a], Jeroen van den Bergh [b,1]

[a] Institute for Environmental Science and Technology Universitat Autònoma de Barcelona, Edifici Z—Campus UAB 08193 Bellaterra, Spain
[b] ICREA, Barcelona, Spain & Institute for Environmental Science and Technology Universitat Autònoma de Barcelona, Edifici Z—Campus UAB 08193 Bellaterra, Spain

A B S T R A C T

Writings on sustainability transitions generally pay slight attention to the specific behavioral characteristics of individuals, groups and organizations. This paper examines how modern insights about bounded rationality, social interaction and learning can contribute to making transition polices more effective in addressing barriers and opportunities to realize a sustainability transition in the near future. We argue that the behavioral underpinnings of features like lock-in, surprises in innovation systems and network interactions have been insufficiently elaborated and connected to policy design. We identify and illustrate the most important behavioral features of relevant stakeholders in transition processes. By focusing on behavioral features at both individual and organizational levels, we arrive at recommendations for policy makers regarding important barriers to change and how to overcome these. Specific policy insights are offered at multiple levels, for different stakeholders, and associated with both behavioral biases and social interactions. The analysis combines insights from the literatures on sustainability transitions, "environmental–behavioral economics", and behavioral foundations of learning and innovation. Our framework may serve as a basis for coherent behavior studies of transitions that otherwise run the risk of being ad hoc. This will improve conditional forecasting of system responses to transition policies.

© 2015 Elsevier Ltd. All rights reserved.

## 1. Introduction

It is now widely accepted that a transition to a low carbon economy is needed in the near future. This represents a fundamental shift away from the current socio-economic system characterized by intensive use of fossil fuels and high pressure on the environment towards a more sustainable economy. Such a transition requires, besides greener technologies, various gradual and radical changes, which will affect social and regulatory institutions, sectoral composition, industrial networks, user practices and consumption (Geels, 2002; Rotmans et al., 2000). Transitions involve the scaling up of system

* Corresponding author. Tel.: +34 935868641.
   *E-mail addresses:* a.gazheli@gmail.com (A. Gazheli), antalmi@gmail.com (M. Antal), jeroen.bergh@uab.es (J. van den Bergh).
   [1] Also affiliated with the Faculty of Economics and Business Administration, and the Institute for Environmental Studies, VU University Amsterdam, The Netherlands.

innovations, which alter the structure of technological and socio-economic subsystems and their connections (Jacobsson & Bergek, 2011).

Current writings on transitions discuss the types of policies that manage, govern and facilitate transitions (Kemp, Schot, & Hoogma, 1998; Kemp & Loorbach, 2003; van den Bergh, 2013a). Most studies, however, adopt a rather abstract and high-level view in which agents and their behavior receive little or just implicit attention. As a result, the literature on transitions is not very well connected with disciplines that have accumulated much knowledge about individual behavior and behavioral change on the basis of empirical evidence. A serious risk is then that transition studies suggest unrealistic, unfeasible or ineffective strategies, policies and scenarios. To address these concerns, this paper aims to offer a behaviorally explicit perspective on the role of the various stakeholders in transition processes, which allows for a detailed analysis of the feasibility and effectiveness of transition policies.

The methodological relevance of our approach is that the long-term issue of a transition to a sustainable, low-carbon economy needs a more coherent and complete treatment from the angle of policy-behavior links. The question here is how policies (can) affect stakeholders showing particular behaviors relevant to a large-scale socio-technical transition, taking into account behavioral features including bounded rationality, behavioral biases and social interactions driven by other-regarding preferences. Our framework is hoped to contribute to improving conditional forecasting of individual and system responses to transition policies. It is aimed to result in a general, systematic approach on which particular case studies, which often are ad hoc with regard to behavior-policy links, can build on. This will improve long-term decision-making that is needed for realizing a sustainability transition in the future. Such a transition should take into account the ultimate effect of the interaction of many complex behaviors that make up the global socioeconomic system (Lopolito, Morone, & Sisto, 2011; Neuvonen et al., 2014; Vazquez Brust, Smith, & Sarkis, 2014).

Agents with different behavioral characteristics play a role in the distinct stages of transitions, notably predevelopment, take-off, acceleration and stabilization (Rotmans, Kemp, & Asselt, 2001). They influence the transition process through their goals, knowledge, information, power, interactions, relations and interests. They include economic agents, such as consumers, producers, and investors; institutions, such as governments and local authorities; and social agents, such as citizens, labor unions and NGOs (Geels, 2010). Agents that have to undergo behavioral change during a particular transition stage will sometimes show resistance to change or inertia. Other agents, however, may play crucial catalyzing roles in transition processes (''change agents''). In addition, new stakeholders may appear or changes in power structures or preferences may occur. Stakeholders may also join forces to cause future changes that otherwise would be impossible, such as in the case of labor unions and employers striking long term agreements. For all these reasons, policy makers do well to take seriously into account proven behavioral features when designing transition policies.

In existing writings, the notion of agency represents the principal behavioral view on transitions. According to theories of agency, individuals are agents proactively engaged in their own development who make things happen by their actions. It gives much attention to the role of power (Smith, Stirling, & Berkhout, 2005). Groups and organizations with different interests often try to alter the balance of power by increasing their political, economic or institutional influence. Since power can hinder or foster transitions, it is good to consider power relations in the analysis of transition policies, and to link these to behavioral features of relevant agents. This approach offers original policy lessons, but it also implies serious limitations in terms of understanding and guiding behavior.

This paper synthesizes insights about the role of agents in transitions. This will involve giving attention to the behavioral characteristics of agents, including of governments, and the behavioral basis of learning and innovation. Our main purpose is to identify the types of bounded rationality and other-regarding preferences of individuals and groups that have to be recognized by regulatory policies in order to improve the effectiveness of transition management. The following stakeholders are distinguished: consumers, producers, investors, and governments. They have distinct behavioral features, which may require the use of multiple, complementary policy instruments.

The paper is organized as follows. In Section 2 we review how behavioral aspects are integrated into current writings on sustainability transitions. Section 3 examines relevant insights about consumer, firm and government behavior. In Section 4 we provide a list of behavioral features, which can act as barriers for sustainability transitions. Section 5 underlines the importance of the behavioral roots of learning and innovation from a transition perspective. In Section 6 we translate the various behavioral insights obtained into general and specific policies overcoming barriers to, and fostering, a sustainability transition. This involves attention to multiple levels, different stakeholders and behavioral biases as well as social interactions. Section 7 concludes.

## 2. Behavior in social science theories suitable for transition studies

The study of sustainability transitions applies theories from different research fields, such as history, political science, sociology, science and technology studies, innovation research and evolutionary economics (Kemp & Loorbach, 2006; Markard, Raven, & Truffer, 2012). Four main approaches have been used so far to integrate insights from these disciplines in order to describe and understand sustainability transitions: the innovation systems approach, the complex systems approach, the evolutionary systems approach and the multi-level perspective (MLP) (van den Bergh, Truffer, & Kallis, 2011). The four approaches overlap to some extent but also relate to unique system elements and processes. Most attention has been devoted to the MLP (Geels, 2011).