



Steering innovations towards a green economy: Understanding government intervention



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ABSTRACT

In this paper we analyse institutional conditions facilitating the transition towards a green economy by encouraging investment in the enhancement of natural capital and social equity, focussing especially on government interventions. Presenting a conceptual institutional model how innovation generally occurs, we depict system levels that can be influenced by government interventions to facilitate societal innovations towards a green economy. We hypothesize that the transition to a green economy is about extending the possibility frontier outwards towards a greener economy while at the same time limiting the “action space” at the brown economy end; a normative evaluation framework is presented to assess transitions correspondingly. We elaborate on the emerging lessons for governance by examining evidence from five selected European case studies, and provide a non-exhaustive list of impacts that government intervention may have on the action spaces available at different system levels.

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1. A green economy vision

Twenty years after the Rio conference on sustainable development, greening the economy has been promoted as a new strategy for enhancing human well-being and reducing environmental risk (Barbier and Markandya, 2013; Pearce et al., 1989). It is seen as a way to implement sustainable development, amplifying the Agenda 21 (UNEP, 2011: foreword). This vision is generally shared: it was adopted at the Rio+20 meeting as part of “the future we want” (UN, 2012), it has been operationalized within the Sustainable Development Goals and their indicators (UN, 2015), and it relates essentially to multilateral agreements such as the climate, biodiversity and desertification conventions. Two investment areas constitute key elements of a green economy: enhancing (i) natural capital, that is, stocks of and flows from agriculture, fisheries, water bodies and forests, and (ii) energy and

resource efficiency, that is, enabling environmental technology in renewable energy, manufacturing, waste management, buildings, transport, tourism and cities (UNEP, 2011). Such focus on investments is justified because “investments shape the future of our economies. Investment decisions choose one type of infrastructure over others, another type of production or technology over others, which narrows down the options for future choices” (UNEP, 2014a, p. 2). Thus, transforming the economy is understood to be about choices between different development paths – a far from trivial matter, considering the scale of the challenges and the changes envisaged. Any economic strategy will require investments, but the normative green economy vision needs both private and public investment to be steered towards greener and fairer strategies. It is therefore recognized that such investments have to be “supported by targeted public expenditure, policy reforms and regulation changes” (UNEP, 2011, p. 16) – which stresses the role of government intervention.

Reducing environmental harm and social inequality while growing the economy requires a transformation of existing production and consumption patterns and thus transformations of the

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entire economy (Allen, 2012; UNEP, 2014a). The green economy perspective thereby focuses on the fundamental origin of environmental degradation – namely, the way the economy currently works. In doing so, it may offer solutions that turn out to be relatively robust against potential setbacks such as rebound effects. Furthermore, it is a macro-economic approach that, as such, may serve to promote overarching policies rather than fragmented ones.¹ Its beneficial aspects notwithstanding, the green economy approach entails certain political difficulties with regard to implementation (Barbier, 2012) as well as high transaction costs (Barbier, 2011). Most importantly, transforming the economy requires innovation in terms of available technology, organizational support, market conditions, the broader societal setting, and the overarching governance framework (Barbier, 2011; UNEP, 2011).

In this paper, we analyse the governance system that may facilitate such innovation and a transition to a green economy, putting a particular emphasis on government interventions. Our research question is: How can governance measures support innovations aimed at transitioning towards a green economy? To this end, we develop a refined model of innovation based on a review of the existing innovation literature and propose a normative evaluation framework to assess the transformative effect of an innovation (Section 2). Analysing particular measures within the continuum of innovation stimulating mechanisms, we focus on the role of the state in enabling the transition to a green economy and illustrate it with evidence from five selected European case studies (Section 3). In Section 4 we discuss our findings and conclude by reviewing the remaining knowledge gaps.

2. The transition towards a green economy from a theoretical perspective: conceptualizing innovation processes and proposing an evaluation framework

Technological innovations are a crucial component of a green economy transition,² but ultimately, such a transition can only be achieved through societal innovation, which has been defined as “a novel economic and/or social improvement to people’s everyday life [... bringing] a (radical or incremental) systemic change to society’s structures or modes of operation, and is legitimated by the majority of societal stakeholders” (Lehtola and Stähle, 2014, p. 172). Two aspects of this definition are particularly striking: i) societal innovation changes the system and ii) it benefits people. On the basis of this understanding, we hypothesize that any intentional system change (e.g. towards a green economy) will require some kind of societal innovation. The question of how such innovation can be fostered in a market economy is vital to understand how a green economy transition can be facilitated.

One particular (collective) actor who has both ability and legitimacy to steer such innovation towards sustainability is the government.³ It can set standards and regulation, create the respective instrument policy mixes, and can thus sanction and

incentivize behaviour of private actors – who do not necessarily have an intrinsic motivation to contribute to a public good of sustainability transitions (Geels, 2011). While there is a broad body of literature about firm and niche innovations that may eventually change the system on a broader scale, analyses of politics and the role of government in societal innovations are relatively scarce (as notable exceptions see Borrás and Edquist, 2013; Flanagan et al., 2011; Geels, 2014; Loorbach, 2010; Smith, 2000; Voß et al., 2009). Thus, we aim to contribute to the literature by i) refining and extending an innovation governance framework based on Röpke (1977) in which we locate government intervention, and ii) proposing a basic, two-dimensional assessment framework which can measure the transformative effect of green economy innovations.

2.1. Innovations for a green economy and the role of governance

Societal innovation or regime shifts are keys to turn existing economies into a green economy. To clarify at which levels such social innovations may occur and take effect we present a stylized conceptual model in which different systems types and levels of institutions are ordered hierarchically (see Fig. 1). The model is based on an older systemic innovation approach developed by Röpke (1977), who adopts a Schumpeterian perspective on entrepreneurial behaviour, differentiating between invention, innovation and the diffusion of novel investments in market-type societies (Schumpeter, 1928). Such a system approach has been taken up by several scholars like Lundvall (1992), Freeman (1995) and Edquist (1997), who developed the so-called National Systems of Innovation approach. A national innovation system can be defined as “all important economic, social, political, organizational, and other factors that influence the development, diffusion, and use of innovations” (Edquist, 1997, p. 14). As a consequence, a national system of innovation should be seen as a complex building with one system interacting with the other subsystems. Focussing on the spatial perspective, the term ‘regional innovation system’ came into use since the 1990s (cf. Cooke, 2015). At its core, the rationale of this research was to address the effects of systematic network relationships for innovation at the regional level (Carlsson, 2006; Uyarra, 2010). Such spatial and sectoral levels of technological innovation systems were summarized in a consolidated multi-level framework by Markard and Truffer (2008). Relating the technological innovation perspective with the literature on strategic niche management and transition management, Markard et al. (2012) clarify that socio-technological innovations change user practices and institutional structures and sustainability transitions imply

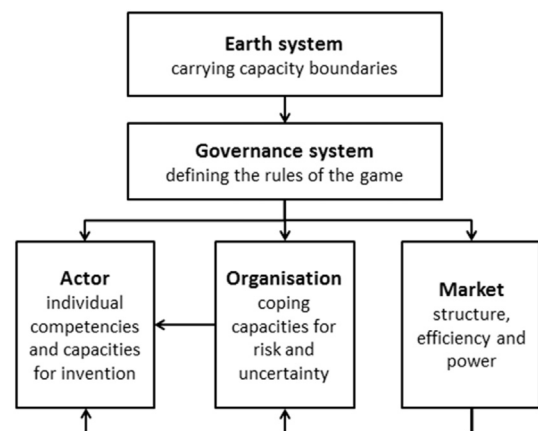


Fig. 1. A framework for green economy innovations, based on Röpke (1977) and adapted and extended by the authors.

¹ One of the most far-reaching political implementations regarding a transition towards a green economy is the EU circular economy strategy (EU, 2015).

² In the transition management literature, transformation refers to a “wholesale shift in the economic mode of production” and transition to an “iterative, incremental change towards uncertain futures” (Brown et al., 2012, p. 1608 f.). In this paper we do not refer systematically to these differences, preferring to use the term rather interchangeably: if a transition is steered appropriately, it may eventually become a transformation (cf. Dolata, 2011).

³ See Cooke (2015, p. 4), who remarks that the „key point regarding governments, and cities particularly in this context, is that they are the main variant to markets as stimulators of change, “Scott (2008) who emphasizes that legitimacy stems from cultural support, moral authority or legal sanction, and Edquist (2001, p. 3) who remarked, that a weakness of the technological innovation approach is that “it lacks a ‘theoretical’ component about the role of the state”.

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