Environmental Innovation and Societal Transitions xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Environmental Innovation and Societal Transitions

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

The politics of innovation spaces for low-carbon energy Introduction to the special issue

Rob Raven[a,b,*], Florian Kern[c], Adrian Smith[c], Staffan Jacobsson[d], Bram Verhees[a]

[a] School of Innovation Sciences, Eindhoven University of Technology, Netherlands
[b] Copernicus Institute, Utrecht University, Netherlands
[c] SPRU-Science Policy Research Unit, University of Sussex, UK
[d] Chalmers University of Technology, Sweden

ARTICLE INFO

Article history:
Received 26 June 2015
Accepted 27 June 2015
Available online xxx

Keywords:
Politics
Protective space
Innovation
Transition
Energy

ABSTRACT

Energy systems around the globe face multiple, major pressures to transform into more sustainable ones. Over the past decades numerous, potentially sustainable energy innovations have been proposed, studied, developed and implemented to varying degrees. In the field of transition studies, scholars have used the notion of 'protective space' to study how such innovations emerge, grow, survive and decline over time, but few take an explicit political perspective on these dynamics. This editorial briefly reviews why such a perspective is necessary, and, on the basis of the contributions in this special issue, what it could entail in evolutionary, relational and institutional terms. The paper ends with six lessons for those involved in sustainable innovation advocacy.

1. Introduction

Energy systems around the globe face multiple, major pressures to transform so as to guarantee more sustainable production and consumption of energy. Climate-change, depletion of resources, access to energy services for development and poverty reduction, and security of supply are all demanding a restructuring of current energy systems (Verbong and Loorbach 2012).

Over the past decades numerous, potentially sustainable energy innovations have been proposed, studied, developed and implemented to varying degrees. This includes, for example, on- and off-shore wind energy, solar PV technologies, carbon capture and storage, bioenergy innovations, insulation technologies, zero-energy buildings, electric vehicles and other greener cars. Some innovations like on-shore wind and bioenergy are supported by well-established innovation systems and are part of regular investment and policy portfolios in certain regions, while others like carbon capture and storage are struggling to become established (e.g. Vergragt 2012; Meadowcroft and Langhelle 2009).

What all these innovations have in common is that they are or have been characterized by (sometimes fierce) contests for social, industrial and political attention and legitimacy. Innovation advocates have had to engage with debates and discourses in the wider world in order to maintain the flow of material and social resources, lobby for favourable contextual changes, such as institutional reforms, and strategically team up with or argue against advocates of incumbent innovation systems

* Corresponding author. Fax: +31 30 253 2746.
E-mail address: r.p.j.m.raven@uu.nl (R. Raven).

http://dx.doi.org/10.1016/j.eist.2015.06.008
2210-4224/

or competing niche innovations. This makes innovation processes in the context of sustainability transitions inherently political (Meadowcroft, 2009).

In the field of transition studies, scholars have used the notion of 'protective space' to study how sustainable innovations emerge, grow, survive and decline over time in the context of mature and well-established innovation systems or socio-technical regimes (Schot and Geels, 2008). Few, however, have paused to consider how such spaces are constructed and transformed and how these processes should be understood from a political perspective (Smith and Raven, 2012). Such a perspective implies not only a good understanding of how emerging niche technologies or technological innovation systems are facing politically powerful incumbent socio-technical systems, but also how claims, counter-claims and bargaining over the distribution of risks and benefits of lower-carbon innovations themselves shape their development. After all, some low carbon technologies imply controversial social and economic consequences, e.g. further concentrations of wealth (e.g. mining profits from raw materials for batteries), centralized authority (e.g. nuclear energy), landscape blight (as argued by some opponents of onshore wind), land-grabbing (e.g. biofuel crops) and geographical shifting of industries and jobs (e.g. production of solar photovoltaic cells from Germany to China). So the physical and social spaces in which these technologies develop and are deployed are infused with politics, in the sense of advocates needing continually to justify the expanding reach of their activities in the wider social world.

Practical examples of the creation of spaces for low-carbon innovation include attempts to lobby policy actors or corporate decision makers for necessary resources such as money and human skills, which can trigger further development of a low-carbon innovation (Kern et al., 2014; Wesseling et al., 2015). Low-carbon innovation advocates may also engage in attempts at actively changing their selection environments through institutional work, for example, by generating media attention in order to influence public discourse or participate in campaigning for changing national or international legislation, or technology and infrastructure standards. All of this occurs in the context of competing societal, policy and corporate agendas, problem definitions and proposed alternative solutions. Consequently, most sustainable energy innovations involve contestation (with varying degrees), e.g. over their costs, desired locations, sustainability, required policies, future potential, alternatives and so on.

The papers in the special issue explore both theoretically and empirically the politics of 'protective spaces' for low-carbon energy innovations from a range of theoretical perspectives, in a variety of empirical contexts. Section 2 continues with a discussion of the importance of taking a political perspective on low-carbon energy innovation. Section 3 briefly introduces four theoretical perspectives for the analysis of protective spaces, motivated by the approaches found in the various contributions in this special issue. Section 4 introduces and summarizes these contributions. The final section draws lessons for those involved in the promotion of sustainable innovations.

2. The politics of low-carbon energy innovation

The identification of innovation and technological development as a political endeavour is not new. Pioneering scholars in the emerging field of innovation studies such as Chris Freeman and Amílcar Herrera pointed out, in response to the original Limits to Growth report, how environmental innovations require changes in over-arching social and economic institutions, and that this was an inherently political endeavour (Cole et al., 1973; Herrera et al., 1976). Redirecting technological change in more environmentally sustainable directions requires policy, and hence political, action (Foray and Grübler, 1996; Rosenberg, 1976). Around the same time, studies into the roles played by technology in society identified the social choices involved in its development, as well as the social consequences of the choices made in technological developments, all of which made technology development a site of political contestation (Winner, 1977; Noble, 1984; Feenberg, 2002). However, while these early studies acknowledged how politics can shape emerging trajectories of technological developments, they were not entirely successful in translating these insights into analytical frameworks that put political aspects centre stage. Instead, approaches like national systems of innovation (Freeman, 1995; Lundvall, 1992) or technological innovation systems (Bergek et al., 2008; Hekkert et al., 2007) became very popular as frameworks for formulating policy advice. While these recognize politics, e.g. by acknowledging the central role of 'political networks' in institutional change (Jacobsson and Bergek, 2004), they rarely analyse political dimensions in any detail.

In the context of deliberately governing innovation and technological development towards more overtly normative outcomes, like sustainability, interest in political issues is regaining attention. Notably, in a somewhat implied way, the early development of strategic niche management acknowledged these themes from an earlier generation of studies of innovation and technology. The concept of second-order learning in niche experimentation for instance, points to the way in which regime routines (e.g. institutional, cognitive, investment, user, policy and industrial norms) are a powerful impediment to further niche development (Kemp et al., 1998). As such second-order learning as compared to first-order learning signals how improvements in the prospects of the socio-technical niche innovation are dependent upon wider changes to social and political structures, Yet, the political work needed to act on second-order lessons, and deliberately 'stretch and transform' selection environments, rather than 'fit and conform' to these structures (Smith and Raven, 2012), has been underplayed. Perhaps this muting arose through the development of transition management in a context of advice to political incumbents rather than political challengers (Smith and Kern, 2009), although arguably this is changing (Narberhaus et al., 2014). Acting upon lessons arising from niche experimentation, which point to the need to radically destabilise and reform inhibiting regimes, will always struggle to find a willing audience, when it criticise the social structures reproducing vested economic interests, positions of political authority, cultural privileges, social norms, technological designs, and research agendas;

Please cite this article in press as: Raven, R., et al., The politics of innovation spaces for low-carbon energy. Introduction to the special issue. Environ. Innovation Soc. Transitions (2015), http://dx.doi.org/10.1016/j.eist.2015.06.008