



Original research article

Dynamics of policy change and intermediation: The arduous transition towards low-energy homes in the United Kingdom

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ABSTRACT

The transition towards low-energy buildings in the United Kingdom is challenging. Several policy changes have affected the actions and agency of actors. Drawing on the sustainability transitions literature, we analyse the development of the low-energy homes niche, focusing on the dynamics between intermediary organisations and policy development for low-energy homes. Based on rich interview and secondary data, we note how the existence and activities of transition intermediaries are enabled or curtailed by policy changes. We identify niche development phases along with the position and activities of intermediary organisations. In the predevelopment phase, non-state transition intermediaries have formed when government policy has been weak or market-based. During take-off, targeted policy initiatives have created protective spaces and stimulated the emergence of new intermediaries aiming to consolidate the niche. State-affiliated intermediaries have been established as part of active energy efficiency policy, but later ceased to exist or became privatised. Existing organisations have adopted intermediary functions to advance low-energy homes in response to policy. Furthermore, intermediaries have on occasion influenced policy development, often through cooperation among an ecology of intermediaries. In conclusion, we raise questions regarding intermediaries in the changing governance context.

1. Introduction

International oil crises of the 1970s led to official building energy efficiency policy in many countries, paving a way towards low-energy buildings. Yet, the existing building stock still today contributes a significant share of carbon dioxide emissions globally, and the transition to low-energy buildings has not progressed very far.

The field is abound with barriers for the adoption of system innovations that would significantly reduce energy demand from buildings [1,2]. Despite new strategies to overcome barriers [2] and the long-established sustainable buildings niche [3,4], the UK transition (largely dependent on energy efficiency policy to stimulate change) is very slow.

We focus on the development towards low-energy residential buildings (from here on referred to as ‘low-energy homes’)¹ in the United Kingdom (UK). UK is a country with an active climate policy community involving central government actors, policy makers and non-governmental organisations [5]. A considerable sustainable housing movement has developed in the last 30–40 years, promoting concepts such as ‘autonomous homes’, ‘eco-homes’, ‘sustainable homes’,

‘low-carbon homes’ and ‘passive houses’ (e.g. [6,7]). While this movement has pioneered new ideas and practices, many of their innovations have not diffused widely [4]. This movement forms a backdrop to today’s low-energy homes niche in the UK.

Empirically, the low-energy homes niche consists of different strands and conceptualisations as noted above. Over time, it has branched into new directions (cf. [8]). Yet, the developments can be seen to form a broader low-energy homes niche due to the niche actors’ similar aims to break free from the existing set of building rules, the interrelations between the actors across new and existing buildings, and the build-up of activities benefitting policy development.

During the last four decades, intermediary organisations have formed to advance innovative projects, create a protective space for their diffusion, and to lobby or implement new policies for low-energy homes. We explore the dynamics of such ‘transition intermediaries’ operating to advance sustainable sociotechnical change through policy development.

Transition intermediaries serve systemic functions, including the facilitation of multi-actor innovation networks, linking demand and supply side for disruptive innovation, and connecting niche innovators

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¹ Low-energy homes are defined here as new buildings designed to use minimum energy, or existing buildings undergone whole house energy retrofit.

to financial and human resources [9]. Such intermediaries may influence transitions by “*disturbing existing structures, practices and behaviours*”, through actively facilitating niche development and/or through aiming to destabilise the dominant technological, institutional and market regimes ([10]: 1371).

We aim to fill a gap in the transitions literature regarding how the emergence and activities of transition intermediaries link to national policy change. Rather than focusing on specific intermediary actors, we trace the low-energy homes niche and policy development in the UK, identifying how multiple intermediaries across the new build and retrofit sectors change and interact with policy over time.

We also aim to unwrap the concept of ‘dynamic ecology of intermediaries’ [11] empirically in the context of niche and policy development. Kivimaa et al. ([9]: 5) described an ‘ecology of intermediaries’ as specific intermediaries having differing competences, remits, and operational models that “*complement but also compete with each other, forming interdependencies and overlaps, sometimes also leaving gaps vis-à-vis a given innovation process or system*”.

Empirically, we explore:

- When and why, during niche development, have new intermediary organisations emerged or existing organisations subsumed roles for low-energy homes vis-à-vis policy change?
- How has this ‘ecology of intermediaries’ changed over time?
- How have the intermediary organisations influenced policy development for low-energy homes?

A backdrop for this analysis is the development of UK low-energy homes policy for new and existing building stock. New build was influenced by a zero-carbon homes agenda taking-off from 2006 onwards and slowing down from 2009, involving a complete policy overhaul in 2015.

We draw on theoretical concepts from the sustainability transitions literature, including phases of transitions [12,13] and niche development [8,14]. We present novel empirical insights, and note how policy change can enable or curtail a dynamic ecology of intermediaries. Our study also shows, importantly, that niche development does not necessarily scale-up but may also weaken after take-off.

We draw on 29 interviews conducted during 2014–2018 and use academic and grey literature to build a description of the UK low-energy homes niche and related policy development during 1970–2016.

Section 2 introduces the theoretical concepts informing our analysis. Section 3 describes the methods. Section 4 starts by focussing on how different policy phases form sub-phases in the broader phases of niche development for low-energy homes, providing a brief historical description. It then moves onto a novel analysis pertaining to the emergence of intermediary organisations, their changing roles and their influence on the policies supporting niche development. Section 5 discusses and concludes.

2. Conceptual setting: niches, phases and intermediaries in transitions

2.1. Niche development

Niches are spaces where networks of actors experiment with more environmentally sustainable organisational forms and technologies [6]. While a niche originally forms around a specific (often technological) innovation, a process of niche branching can follow, containing subsequent niches, e.g., new application domains, formation of market niches, or niche replication [8]. White and Stirling ([15]: 839) note that “*‘niche’ is not objectively empirically fixed in any given setting, but depends heuristically on the purpose and level of analysis*”.

Multiple projects are seen to form a technological trajectory, and produce generic lessons and shared cognitive rules through dedicated aggregation activities [16]. Actors sharing similar aims coalesce and

construct narratives to draw attention and material resources for advancing the niche [17]. Intermediary actors may become crucial in aggregating lessons, connecting actors and forming narratives. Niches can be protected through support from suppliers, users and public policy, the latter including, for example, subsidies and favourable treatment in legal frameworks [17].

Prevailing socio-technical regimes consist of dominating technologies, institutions, practices and cultural norms [18], ‘against’ which niches have to perform [19]. Overarching, long-term landscape developments, e.g., political trends, environmental changes or wars [18] create pressure on regimes, providing opportunities for new niches [14].

2.2. Phases of transitions and niche development

The literature describes phases of transitions as predevelopment and exploration, take-off, acceleration, and stabilisation [12,13]. As these are broad for analysing the intricacies of niche development, we also draw on niche development studies. Rotmans et al. [12] describe how the concept of ‘transition’ can be applied at different levels of aggregation (companies, sectors, countries, regions), developments of which can be followed over time and compared to each other.

The *predevelopment* phase is depicted as a dynamic equilibrium, where no visible changes can be observed to status quo [12], and it involves small-scale, temporary experimentation [13]. Rotmans et al. [12] note that transitions may appear fast even when the predevelopment phase is long, and the take-off phase remains largely unnoticed.

Yet, *take-off* is more visible [12], illustrated by the build-up of novel solutions [13]. During take-off, niche development advances from individual experiments to strategic actions that aggregate experiments, build agendas and create temporary protective spaces for the niche; partly enabled by policies such as R&D or deployment support schemes [20]. During take-off, the niche is expected to face significant opposition from regime actors.

In both predevelopment and take-off phases, niches benefit from *shielding* processes (e.g. the creation of support and funding schemes) that create protected space away from mainstream selection environments [20]. In both phases, *nurturing* also takes place, consisting of three processes: *articulation of expectations and visions* by piloting new concepts, lobbying for change, and creating new standards; *creating a space for learning* by providing education, advice and aggregated knowledge from experiments; and *connecting actors* by creating networks and pooling resources [20].

In the *acceleration* phase, niches become more established, and the developed technological or social innovations diffuse more widely, starting to compete in mainstream markets and with the incumbent regime [21]. The niche becomes competitive within mainstream socio-technical practices (fit-and-conform) or is coupled with institutional reforms and re-structured regimes that make the mainstream market favourable to niche innovations (stretch-and-transform) [20]. Structural changes become noticeable through a build-up of socio-cultural, economic, ecological and institutional modifications [12,13].

In the stabilisation phase, a former niche has become the new regime [21].

Safarzyńska et al. [13] note how the notion of a multi-phase transitions directs attention into the timing of (policy) interventions to steer transitions. They draw on an example from Zundel et al. [86] how during stabilisation and early predevelopment, investments into a diversity of promising solutions would be useful to increase the scope of learning. In later transition phases, if the transition path is unstable, implementation of destabilising policies, such as environmental taxes or tradable permits and withdrawing political support for old technological solutions may be needed [13]. Yet, such ‘unlocking’ of policies does not happen self-evidently and can be extremely difficult [13,87].

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