

Title

Policy instruments for innovation towards environmentally sustainable buildings in Norway

Authors

Hilde Nykamp, I Centre for Technology, Innovation and Culture, University of Oslo, Sverdrups gate 4b, 0559 Oslo, Norway.

Email: hilde.nykamp@tik.uio.no

Keywords

Sustainable drug development, pharmaceutical innovation system.

Introduction

Buildings, both new and existing, are responsible for a significant share of greenhouse gas emissions and natural resource use. Changes in the construction sector and its output, the built environment are key to meet climate change policy targets. Innovation and technological development are increasingly seen as solutions to such societal issues. This paper examines the specific policy instruments relevant for innovation towards sustainable buildings and retrofits in Norway. Policy instruments in this field are diverse and sometimes incompatible, with differing underlying rationales and sometimes-conflicting goals. Traditionally innovation has been thought of as a purely economic phenomenon. When the goal is a collective good and not only economic benefits it is assumed that the importance of understanding the role of regulation and policy is magnified.

Within the theoretical perspective of innovation systems, attention is directed to interaction among actors and institutions and industry context. Innovation system analyses' have moved beyond static descriptions of system structure, but lack nuance and explanatory power when it comes to policy. It is argued here that closer examination of specific policy instruments can bring useful insights to a systemic analysis of an industry or a technology.

Objective

The construction industry has been largely absent from systemic innovation research. Applying a system of innovation approach to the analysis of construction can provide insights into the functioning of the system as a whole. Additionally this paper explores in more detail the specific policy instruments. Many studies of policy with regard to sustainability in construction exist (Tambach, Hasselaar et al. 2010; Murphy, Meijer et al. 2012), but few studies of innovation incorporate insights or methodologies from these.

The purpose of this paper is twofold, first, to identify specific policy instruments in the field of sustainable buildings. Secondly to analyse those policy instruments in terms of their theoretical rationale and their perceived effect. This is done in an effort to add advisory depth to the systemic innovation analysis of a field.

Theoretical perspectives

Understanding industry context and the interactions and linkages between agents and institutions is at the core of the systemic approach to innovation. A technological innovation system may be defined as a subsystem of a sectorial system, or around one technology transcending industry limits. A central feature of this approach to innovation systems is the dedication to analysing functionality. As in much of the innovation literature, informing policy makers is made an explicit goal in the TIS approach (Carlsson, Jacobsson et al. 2002; Hekkert, Suurs et al. 2007; Bergek, Jacobsson et al. 2008).

The role of policy is contested in the innovation systems literature. Policy is both an intrinsic part of the system, but also an agent of change. Kuhlmann, Shapira et al. (2010) refers to interaction between policy, practice and theory as the dance of innovation and innovation policy.

In another strand of literature, policy instruments are seen tools of governance, and the choice of tools needs to match the job (Salamon and Elliott 2002). The image of policy

makers being equipped with a repertoire of instruments seems to fit with the reasoning in the literature on technological innovation systems. Finding an optimal policy mix and applying it is enticing, but fails to consider that there can be no perfect design for an unknown end-state (Chaminade and Edquist 2010). Like the evolutionary roots of innovation studies the idea of perfect information and rational agents is rejected within this view of policy instruments. Instead nuance and precision, beyond the good or evil (carrot or sticks) is called for in the analysis of policy instruments (Howlett 2004).

Empirical field

There are different names and meanings given to sustainable buildings – because there are many interpretations of sustainability. The term “sustainable building” is used here because it encompasses several specific design approaches. Within this understanding, there are specific product innovations, for example new building materials or very low u-value windows etc. The point here is not to talk only of specific components. The innovations of interest here are conceptual or architectural. That is innovations in organizational form or organization of process (Henderson and Clark 1990).

Howlett (2004) argued that policy should be sensitive to context. There are some features of the construction industry to consider. The uniqueness of each project leads to some “reinventing the wheel” in every project. The discontinuity of project work is not conducive to the formation of routines. Routines cumulate to enhance an organization’s skills and increase firm’s incremental innovation opportunities (Nelson and Winter 1982; Fagerberg 2005). Procurement practices – competitive tendering and extensive subcontracting cause fragmentation. Temporary organizations are held together by legal contracts only.

Methods

The intention in this paper is to take the policy instrument as the unit of analysis in an effort to describe and analyse the repertoire of available instruments in the field of sustainable construction (Salamon and Elliott 2002). The method applied is adapted from Murphy, Meijer et al. (2012) and is a simplified version of the theory-based-evaluation applied in Harmelink, Nilsson et al. (2008). The idea behind theory-based-evaluation is that in the formulation of a “theory” of what the instrument should do and why. This process of tracing the logic and thinking behind the instrument can explain how they work (Weiss 1997; Harmelink, Nilsson et al. 2008; Murphy, Meijer et al. 2012).

The process of analysis is iterative, but is expected to follow these steps.

1. Identify the relevant instruments.
2. Trace the theoretical rationale behind the instrument.
3. If it is possible, evaluate its effectiveness. Two data sources are considered appropriate for this. First secondary data from existing policy evaluations, secondly primary data from qualitative interviews in the industry.

Expected results

I expect to be able to create an overview of relevant instruments according to type and an analysis of theoretical rationale and perceived impact.

Type of Instrument	Underlying theory/ Policy rationale	Impact of instrument	
Regulation type instruments		Secondary data - existing evaluation (or perhaps conspicuous lack of evaluations)	Primary data From qualitative interviews with industry organizations and policy makers
Economic type instruments			
Information type instruments			
De-facto type instruments Standardization			

Hopefully such an overview can contribute to a discussion of possible fragmentation or lack of coherence between policy instruments and that possibly little attention has been paid to the “cocktail effect” of such instruments.

References

Bergek, A., S. Jacobsson, et al. (2008). "Analyzing the functional dynamics of technological innovation systems: A scheme of analysis." Research Policy **37**(3): 407-429.

Carlsson, B., S. Jacobsson, et al. (2002). "Innovation systems: analytical and methodological issues." Research Policy **31**(2): 233-245.

Chaminade, C. and C. Edquist (2010). Rationales for Public Policy Intervention in the Innovation Process: Systems of innovation Approach. The theory and practice of Innovation policy. R. E. Smits, S. Kuhlmann and P. Shapira. Cheltenham, Edward Elgar Publishing

Fagerberg, J. (2005). Innovation: A guide to the literature. "The Oxford handbook of innovation". J. Fagerberg, D. C. Mowery and R. R. Nelson. Oxford, Oxford University Press: XVIII, 656 s., ill.

Harmelink, M., L. Nilsson, et al. (2008). "Theory-based policy evaluation of 20 energy efficiency instruments." Energy Efficiency **1**(2): 131-148.

Hekkert, M. P., R. A. A. Suurs, et al. (2007). "Functions of innovation systems: A new approach for analysing technological change." Technological Forecasting and Social Change **74**(4): 413-432.

Henderson, R. M. and K. B. Clark (1990). "Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms." Administrative Science Quarterly **35**(1): 9-30.

Howlett, M. (2004). "Beyond Good and Evil in Policy Implementation: Instrument Mixes, Implementation Styles, and Second Generation Theories of Policy Instrument Choice." Policy and Society **23**(2): 1-17.

Kuhlmann, S., P. Shapira, et al. (2010). Introduction. A systemic perspective: The Innovation Policy dance. The theory and practice of innovation policy R. E. Smits, S. Kuhlmann and P. Shapira. Cheltenham Edwards Elgar publishing

Murphy, L., F. Meijer, et al. (2012). "A qualitative evaluation of policy instruments used to improve energy performance of existing private dwellings in the Netherlands." Energy Policy **45**(0): 459-468.

Nelson, R. R. and S. G. Winter (1982). An evolutionary theory of economic change. Cambridge, Mass., Belknap Press.

Salamon, L. M. and O. V. Elliott (2002). The tools of government : a guide to the new governance. New York, Oxford University Press.

Tambach, M., E. Hasselaar, et al. (2010). "Assessment of current Dutch energy transition policy instruments for the existing housing stock." Energy Policy **38**(2): 981-996.

Weiss, C. H. (1997). "Theory-based evaluation: Past, present, and future." New Directions for Evaluation **1997**(76): 41-55.