

# Between standardisation and flexibility

## Norwegian controversies around sustainable building certification

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*ABSTRACT: We are currently witnessing in the Norwegian building sector (and elsewhere) the transition from isolated and heterogeneous sustainable building projects carried out in protected niches (e.g. pilot projects) to more sustainable buildings becoming mainstream. According to scholars studying sustainable transitions this is the moment in which a dominant design catches on, replacing and displacing other more or less sustainable alternatives.*

*Within this process, in the Norwegian case, the principles behind the passive house play a salient role. In fact, only recently a government white paper has called for "passive house levels" to become part of the building code by 2015. This strong focus on passive house principles is not without its critics and alternatives. Since 2010, a controversy about health and other negative impacts of insulating Norwegian houses (that are traditionally light wooden structures) to passive house levels has been going on in the Norwegian public and among experts. And recently, the building industry has entered the field with an adaptation of the BREEAM certification scheme which gains ground rapidly.*

*In this paper we describe and analyse these three options - passive house, its critique and BREEAM - of defining green and sustainable building in Norway based on media analysis and interviews with their respective proponents.*

*We describe potential compatibilities and incompatibilities and conclude with questions for further research.*

*KEYWORDS: environmental certification, standardisation, passive house, BREEAM*

### INTRODUCTION

Recently, tree houses built by Robert Protokar's Architecture Office were featured extensively in the world of architectural blogging under the banner of "green building". Guy and Farmer [5] showed that today, these "decentralized, autonomous buildings with limited ecological footprints" that seek "[h]armony with nature" (p. 141) are only one of at least six different types of "green buildings". In their literature review, they also found approaches that focused on the technology, health, aesthetics, culture, and social aspects of green living. The pluralism that exists within sustainable architecture is not surprising given the differentiated nature of ecological political agendas [3] and storylines [9]. In the current situation, however, in which governments around the world have identified sustainable building as a cost-efficient arena for climate mitigation and energy savings, the question emerges as to which sustainable building concepts and philosophies will become the dominant models in the shift towards green building. In many cases, there are overlaps between the different approaches and solutions representing the best of two or more concepts are available. To put it mildly, however, years of differentiation and isolated experimentation have not been beneficial to the search for common ground. The result is controversy surrounding the "right" way of building green that often goes far beyond discussions of actual architectural solutions, reaching instead into the

realm of disagreements about what "a good life" may be.

In this paper, which is based on media analysis, qualitative, semi-structured interviews with stakeholders and participant observation, we present current controversies unfolding within the Norwegian green building scene and the general Norwegian public. We focus on activities connected to the definition and standardisation of green building and show how these seemingly 'innocent' activities embody professional and cultural values. In addition to being concerned with the actual choices of which aspects of "greenness" are privileged and how, these controversies are about a more fundamental choice concerning the degree to which green buildings should be standardised at all. This latter aspect is closely related to two positions in the social scientific literature on sustainable socio-technical transitions that we present in the next section.

### ONE TRANSITION OR MULTIPLE PATHWAYS?

Moving beyond technological determinism and purely sociological perspectives, socio-technical approaches focus on the interplay between humans and the material world in which we live. A basic insight of such socio-technical approaches is that buildings, individual technologies and technological infrastructures support their users' actions but may also constrain them. In addition, material structures have been shown to be

constantly reconstructed, deconstructed and adapted to their users' needs.

Socio-technical approaches have been used extensively in the study of the change and stability of society and its technologies (or technologies and their society). Numerous studies have shown how innovation depends on successful exchanges among inventors, tools, researchers, research infrastructures, politics, early adopters, and end-users. More recently, with the mainstreaming of sustainability concerns, sustainable innovation has become an important topic in this line of research. Sustainable innovation adds new motivations for innovation into the equation, such as measures of environmental impact, as well as more philosophical questions of what constitutes "a good life" [1]. Another characteristic of sustainable innovation is that it often sets out to replace a less sustainable infrastructure that has evolved over decades - if not centuries - and that is therefore protected against change by a host of vested interests and technological lock-ins.

In this paper, we focus on two approaches that promise to tackle the problems that emerge when sustainability becomes the main driver for innovation. These approaches were chosen because, despite being similar in their socio-technical perspectives, they mark opposing poles in how they conceive of the relationship between early experimentation and subsequent diffusion.

First, the so-called multi-level perspective on sustainable transitions (MLP) distinguishes among niches, regimes and landscapes, each of which is characterised by a different degree of malleability. While experimentation is possible in socio-cultural niches, socio-technical regimes are characterised by stable configurations of actors and their resources. Finally, in socio-technical landscapes, pressures that are capable of bringing about change build up slowly and infrequently. Consequently, the transition framework locates one important origin of innovation in niches and local experiments that create early learning environments, which are important later when innovations leave their niches. This occurs when the innovations are combined with designs and experiences created in other niches, which ultimately enables them to successfully enter the regime level. In addition to emerging alternative designs and solutions, according to studies of historical transitions, this process presupposes pressure from the landscape level that cannot be met by the incumbent regime and therefore creates openings for new actors and their solutions.

In the context of sustainable building, the individual building project provides a convenient unit to describe a niche. In fact, there exists a huge variety of different

buildings that each claim to have solved the challenge of building sustainably. However, in a world consisting only of such isolated niches (i.e., individual buildings), overarching definitions, processes and standards would not exist (and not be necessary). Therefore, in the words of a transition theorist, in a

"second phase, the novelty is used in small market niches, which provide resources for technical specialisation. Gradually a dedicated community of engineers and producers emerges, directing their activities to further improvement of the new technology. As this community articulates new rules, the new technology develops a technical trajectory of its own. As users interact with the new technology and incorporate them into their user practices, they build up experience with it, and gradually explore new functionalities. This second phase results in a stabilisation of rules, e.g. a dominant design, articulation of user preferences." [4: p. 368]

What Geels describes here for water supply and personal hygiene resonates well with sustainable building as it has emerged so far, as, for instance, in the case of early passive house developments in Germany and Austria that have successfully created niche markets populated by 'a dedicated community' of engineers, producers and architects [11]. The next logical step in such a transition is the breakthrough of the new technology that then is able to actively compete with existing solutions [4: p.369].

While transitions researchers are not necessarily personally involved in the actual management of the sustainability transitions that follow their historical descriptions, they are at least not antipathetic to their research being used to support sustainable alternatives to existing regimes. To achieve this, tools such as strategic niche management (SNM) have been proposed [12].

With the ultimate goal being to lead new technologies out of their protected niches and into the mainstream, this approach differs markedly from the role of the researcher as it is described by proponents of what has been called the pathways approach:

The role of research is to keep alive a multiplicity of pathways by opening a wider discourse and dialogue about the types of futures we might be able to create. [6: p. 273]

An example from this agenda is the result of the ESRC-financed project "Zero Carbon Habitation: An International Comparison", in which Simon Guy and his colleagues identified three co-existing pathways to zero carbon habitation, which they called demonstrating (e.g., BRE Innovation Park), mainstreaming (e.g., Greenwatt Way) and socialising (e.g., The Wintles). These three

differ in that they are driven by different key actors and have different scales and aims. The researchers studying these examples have no intention of ranking the different pathways or discussing how they can be combined [10]. The logic behind this refusal to provide clear-cut guidance is based on the analysis of the built environment as being far too contested and heterogeneous to lend itself to one best process or solution [6]. Instead, “rather than lament the apparent inability to standardize a singular approach to degraded environmental and social conditions, we celebrate pluralism as a means to contest technological and scientific certainty” [7: p.15].

The profound changes undergone by the passive house standard in its short diffusion history are an example for this “contingent and contextual nature of technological innovation in building design” [6: p.138].

## **METHODS**

In the empirical study of socio-technical innovation, the study of controversies has a central role. The basic assumption here is that technologies are taken for granted and fade into the background as long as they are uncontroversial, which makes their study particularly difficult. Fortunately for the scholar of socio-technical change, very few innovations are completely uncontroversial, especially if a very broad definition of controversy is used:

"Controversies begin when actors discover that they cannot ignore each other and controversies end when actors manage to work out a solid compromise to live together. Anything between these two extremes can be called a controversy." [14: p.4]

In the very moment in which such a controversy is enacted more or less publicly, research on socio-technical innovation is provided with rich material that leaves traces in the media, in private and semi-private conversations and all types of documents. Controversies are also usually remembered vividly, which makes them accessible in interview and questionnaire studies.

In this paper, we report preliminary findings from three different empirical investigations. First, we analysed 2,338 newspaper articles on sustainable building concepts published in Norway between 2005 and early 2013. This analysis was conducted using an open coding strategy and simple keyword counts (part of the PhD project of Liana Müller). Second, we interviewed seven experts working within the Norwegian sustainable building certification community. They represent BREEAM (Nor), the Norwegian approach to passive house certification and the Norwegian Gaia Lista AS that is known to represent an alternative approach to the more established options

(MA project of Martin Anfinssen). Finally, the main author (Thomas Berker) has been observing Norwegian efforts to mainstream sustainable buildings as a work package leader in the Norwegian Research Centre on Zero Emission Buildings, an 8-year, 30 million Euro research effort designed to establish the conditions under which zero emission buildings can become feasible in Norway.

## **OBSERVATIONS**

Similar to all European countries, Norway is obligated to implement the European Directive on energy performance in buildings (EPBD) and, in an ambitious white paper on “Good buildings for a good society” (2012), has promised to put regulations in place that will enforce “passive house level” performance for all new buildings beginning in 2015. Two Norwegian passive house standards (NS3700 for residential and NS3701 for non-residential buildings) exist, both of which are adaptations of the standards proposed by the German Passive House Institute, barring two important differences: the Norwegian passive house standards are based on other Norwegian standards for calculation, and they allow for slightly higher energy demand in cold climate zones. At the same time, the Norwegian Green Building Council is emerging as influential certification agency for a Norwegian adaptation of the BREEAM standard (aptly called BREEAM Nor). The differences between BREEAM and BREEAM Nor include slightly higher demands for indoor air quality and energy performance.

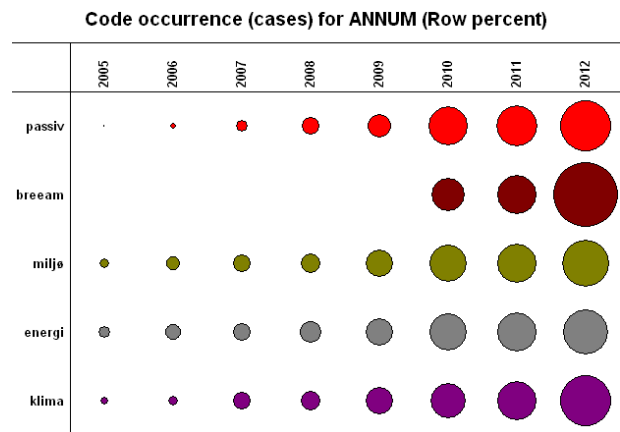
These adaptations of well-known international standards represent two different philosophies for standardising a building’s environmental performance. The first and most obvious difference is that the passive house concept places paramount importance on energy demand, whereas BREEAM (Nor) consists of a large number of criteria, of which energy use is only one important aspect. Consequently, the passive house standard is based on simple principles and coherent calculation methods. This makes it particularly attractive within more or less detailed building simulations that predict energy performance using a broad variety of simulation software tools. Each of these tools has its own “politics”, i.e., each emphasises different aspects of performance and incorporates different standardised calculation methods [8: p. 38-43]. The passive house standard thus also focuses on standardising calculation methods and, in the German case, even comes with its own software tool (the Passive House Planning Package). The field of computer-based simulation and the consequent passive house standard in its various guises is close to engineering expertise. This is illustrated very well through the observations made in a workshop with partners of the Norwegian Research Centre on Zero Emission Buildings conducted in 2010.

In this workshop, an engineer from a large construction firm and an architect from a large architectural office each gave a presentation on the qualities that a “good” zero emission building should have. The presentations could not have been more different. The engineer asked the ‘provocative’ question of whether a bedroom needs a window at all, as removing the window would increase energy efficiency dramatically in a room where a window is not really necessary. The architect, conversely, defined the environmental quality of a building through its exchanges with the surrounding environment, showing images of an open shed in the forest. This difference could be discounted as a question of personal preference if it were not for the defining characteristic of passive houses as being basically closed systems with carefully controlled in- and outflows of air. Following this logic, a room without windows could indeed be a cost efficient way to achieve low heat loss.<sup>1</sup> In addition to being energy efficient, the closed system with clearly defined and controlled interfaces makes concise calculations easier, or at least reduces error margins.

BREEAM (Nor) works very differently. It operates using score cards by which otherwise unrelated criteria are benchmarked and can then be used to compensate for one another. For instance, BREEAM Nor gives positive credits for the possibility of natural ventilation through occupant-controlled window openings and poses additional requirements on buildings that do not allow for occupant-controlled windows (BREEAM Nor, v. 1: p. 105). This broader approach to sustainability creates a need for a host of individual definitions because much less can be derived in a calculatory way from simple principles. In addition, the rules by which different scores can compensate for each other are defined beforehand. These characteristics give the certifying body (the industry-backed Norwegian Green Building Council) an important role. The main qualification required by this certification is knowledge about the many definitions laid out in the BREEAM Nor standard. This downplays engineering or architectural knowledge in favour of the bureaucratic exercise of administering and applying a set of standards.

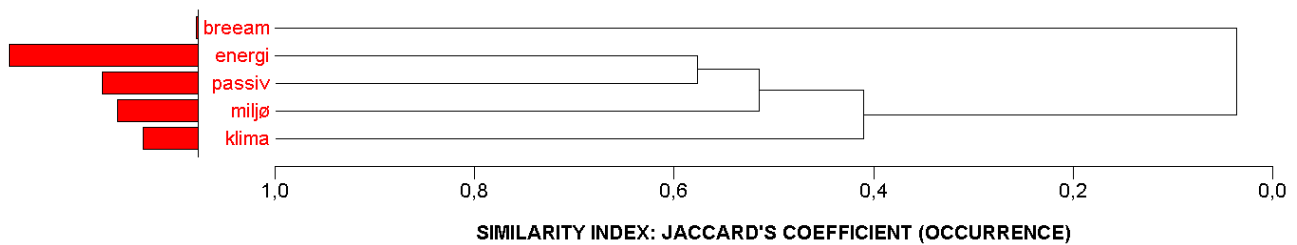
The differences between BREEAM (Nor) and the passive house concept or standard are clearly understood and represented in 2,838 newspaper articles published between 2005 and early 2013, based on a full text search for green, sustainable and energy efficient buildings in the newspapers archived by the A-Text retriever, (retriever.no), which also gives us an indication of when these concepts appeared in the public discussion.

In absolute numbers, the passive house concept dominates the discussion with a visible increase between 2009 and 2010. This is also the year when BREEAM Nor entered the scene, which catalysed a further increase in mentions between 2011 and 2012.



*Occurrence of concepts in Norwegian newspaper articles 2005-2012 (circles represent row percent)*

We added three more general concepts and their count per newspaper article because we wanted to know how they are related to the building concepts: “energi” (energy), “klima” (climate) and “miljø” (environment). The graph above shows a steady increase for all three concepts. Clustering these terms by co-occurrence within the same article results in the dendrogram below, which shows the relationship between energy and the passive house concept on the one hand and the more general approach reflected in how newspapers write about BREEAM (Nor) on the other.



*Co-occurrence of concepts within newspaper articles (2005-2012)*

The degree of insulation needed to achieve passive house qualities and its focus on energy has led to sometimes grim criticism. The main points that have been reiterated continually since 2010 are related to the fear of moisture in buildings that cannot “breathe”. The critics have found their main spokespersons in architects and consultants related to the architectural office Gaia Lista and a senior physician from the Norwegian labour inspection authority ("arbeidstilsynet"). According to these critics, Norwegian building codes are heading in the wrong direction when they aim at prescribing passive house principles. Instead, these critics call for a wide pluralism of approaches that is very much in line with what has been described as the pathways approach. Therefore, BREEAM (Nor) and similar approaches are appraised positively but without enthusiasm, with their weighting systems and arbitrary choices of indicators serving as the main sources of criticism [2].

## DISCUSSION

In the previous section, we introduced two very different options for defining a building as sustainable in contemporary Norway: first, there is the vision of a tightly controlled envelope in the passive house concept, and second, the umbrella certification of BREEAM Nor. This paper does not seek to judge the healthiness of passive houses in general or, more specifically, in the Norwegian climate and building tradition. We also do not seek to judge the degree of reason incorporated in the definitions comprising the BREEAM (Nor) certification.

More important in the context of this paper is the question of co-existence between these two (and possibly more than two) different answers to the question of how to define green buildings. Neither of the two options discussed here excludes the other in principle; however, they are inclusive in different ways. While the passive house proponents flag the performance-based character of their standard – in other words, many solutions are acceptable as long as they reach the prescribed numbers – BREEAM Nor has built the plurality of otherwise unrelated criteria into its certification system, a plurality that is restricted by the fact that all buildings must be ranked according to a one-dimensional classification system. Finally, critics of the passive house (and, to a lesser degree, BREEAM) call for a more fundamental openness that would allow for locally adapted solutions.

Despite this conspicuous tolerance for alternatives, all three options favour certain choices and prevent others from being made - without at least a partial unambiguousness the options would not make sense at all. In terms of transition theory, a discussion of which options have which consequences would be useful as a

stepping stone on the way to an even more limited number of design options finally becoming the new mainstream. When seen as part of a sustainable transition due to its internal flexibility, the BREEAM Nor certificate may allow for a too large a degree of variation that does not produce a recognisable alternative. Especially with elements of the passive house standards being close to entering the building code, a transition perspective would most likely seek for BREEAM (Nor) to be a promising candidate for a new dominant design that still allows for some variation and innovation due to its performance-based character.

From a pathways approach, the picture looks different. Here, the strong focus on energy in the passive house concept is as suspicious as the one-dimensional ranking within BREEAM (Nor). According to this perspective, only the outspoken critics of either certification becoming (the de facto) standard are able to provide the type of varied and complex solutions that the built environment needs.

## CONCLUSION

In this brief paper, we have described two concepts for green buildings and how they differ. With the coming building code under active development, it is difficult to draw conclusions about how the options discussed here will develop. Our observations indicate that BREEAM Nor could potentially ally itself with critics of passive house approaches. The more holistic approach of the BREEAM Nor standard and the focus on natural ventilation represent conceptual contact points between these two approaches. With the passive house proponents on the offensive, however, this alliance may easily turn into a weak defence of the status quo, even if this is not the intention of the individuals propagating these positions.

The conceptual tools used in this paper - sustainability transitions and the pathways approach - put the question of mutual exclusion on the agenda. We have seen three different ways of avoiding (at least the impression of) a one-sided domination: performance-based standardisation (passive house), score card-based benchmarking (BREEAM Nor) and the defence of the status quo's naturally grown heterogeneity (critics of passive house). Given the fact that the BREEAM Nor certification scheme enjoys support from an otherwise rather change resistant building sector, especially if the criticism of passive houses turns conservative, the question can be asked whether these approaches can be part of any considerable change at all. In this respect, the passive house standards are much more radical.

Our findings thus far are based on a preliminary analysis of the material, which consists of interviews, an analysis of media discourses and observation protocols

from Norwegian building research. In the in-depth analysis that will ensue, the aspects identified here - above all, the question of mutual support or exclusion between green building definitions - will be explored in detail.

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## FOOTNOTES

1. This would, however, reduce thermal gains.

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