Building a new house: home or building? - mediating between energy efficient and comfortable homes

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Building a new house: home or building?
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Implementation of low energy technologies and practices in new buildings still lacks behind, even in innovation projects, where local planning authorities make active efforts to facilitate the promotion of such technologies and practices. In this paper, we explore dynamics of innovation relevant for such lack of implementation, inspired by practice theory, by mirroring two different ways of conceptualizing the building of a new house. We show that the developers of the building project often tend to conceptualize the house as a home, whereas the local planning authorities tend to conceptualize the house as a building. We argue that such a gap in conceptualization of the house has an impact on the ability of planning authorities to successfully facilitate innovation in the building sector in terms of implementing low energy technologies and practices. Based on these findings, we provide some reflections about changes in planning practices that may support bridging between the two conceptualizations and provide more rewarding innovation processes.

Introduction

Homes represent important sites of innovation in relation to sustainable development. Of special concern is currently the energy efficiency of the home, since current legislation (e.g. the EPBD) poses great emphasis on improving building envelopes and energy systems of the home and certain requirements in this regard have been forwarded. However, authorities involved in implementation of such improvements in energy efficiency of homes experience a great deal of frustrations in this regard, since developers do not seem to take energy efficiency into account during new building projects.

In this article, we seek to explore why implementation of low energy technologies and practices in new buildings lacks behind, even in innovation projects, where local planning authorities make active efforts to facilitate the promotion of such technologies and practices. Whereas several experimental building projects have been carried out and studied that apply a demonstration perspective to energy efficiency, few innovative mainstream building projects have been carried out and studied. In this paper, our emphasis is put on exploring innovation in such mainstream building projects, since we believe that one of the key challenges in terms of promoting low energy technologies and practices in new buildings is how to deal with existing norms and standards in society. By studying implementation of low energy efficiency technologies and practices in mainstream building projects we are able to explore how innovation in existing norms and standards take place (or not).

Our idea with this paper is to mirror two different ways of conceptualizing the building of a house. On one hand, such a building project represents the idea of establishing a framework for a new home, where the building company attempts to fulfill the dreams and ideas about the new home of the house owner. On the other hand, such a building project represents the idea of planning and constructing a new building, which will constitute a part of a new urban district in a local area, where urban planners and other authorities are involved in setting up targets for how the area should be developed. These two very different ways of conceptualizing the building of a house are analyzed in the paper in order to explore how low energy technologies and practices challenge existing norms and standards. Based on this analysis, we are able to discuss whether a bridging between these conceptualizations of the house is necessary in order to successfully promote more energy efficient technologies and practices.

Specifically, we look into a concrete attempt to facilitate low energy buildings in a new urban development area in Denmark, where a local authority did actively engage in building processes of mainstream one-family houses in order to promote low energy technologies. By looking at a specific building project in this urban development, we show how the planning authority only succeeded in promoting some technologies, and not others, and how energy efficient practices failed to be realized.

Approach

The idea of mirroring different conceptualizations of the house is inspired by practice theory, which emphasizes the need to consider escalating norms and standards of the home in relation to climate change policies (Shove 1998). As Shove (2010) argues, much policy making currently seems to apply a too limited understanding of the social world and how it changes, since a so-called 'ABC framework' is applied, based on the idea that e.g. distribution of information will induce changes in behavior. Whereas we basically agree with this argument, we do, however, feel the need to further explore the social challenges that policy makers are facing in the practical context in which they operate. These social challenges are crucial to explore, since we experience that certain policy makers are actually undertaking processes of facilitation and mediation that goes beyond the ABC framework. However, these policy makers are struggling to succeed in working on different social aspects, like promoting low energy technologies and practices in mainstream building projects.

Shove (2010) especially points towards lack of knowledge flow in the sense that policy makers are not aware or acknowledge the knowledge put forward by social innovations theories. However, we wish to show that it is also a question of recognising the contingent, contextual and practical character that this kind of 'engineering' activity, that policy making is, has (Hård 1994:552). As Shove (2010) also indicates there is already a tendency within a field like spatial planning that broader ideas of social change are embedded in the process of addressing climate change issues. We find that there is need to elaborate on such empirical examples of planning approaches that aim at configuring actors to change routines. This supplements the more knowledge based focus that Shove (2010) has with a study of the practical and pragmatic social context in which initiatives to solve climate change take place in practice. Although the complexity of processes of re-configuring the fabric and texture of daily life are widely recognised, few studies have actually looked specifically at how the practice of climate change planning is performed with the aim to understand the social context in which climate change initiatives get their specific form in specific local projects.

Our intention in the paper is to illustrate both the technical and social work related to the building of a new house, seen from the perspectives of planning authorities and developers, respectively. Firstly, we wish to show how spatial planning is characterized by a practical kind of engineering activity, where the planners work on establishing a regulative and facilitative framework that enables them to promote low energy technologies and practices. Our argument is that this engineering work entails a rather technical perspective on the house, conceptualizing it as a building that needs to be modelled appropriately. Secondly, we wish to show how the development process of the building project is strongly imbued with societal norms and standards about what a home is. We wish to show that although this development process has important technical features – like deciding about the building structure, the tightness of the building envelope – it especially represents a social process, in the sense that decisions taken during the building process reflects visions and dreams about the kind of daily practices that the house will allow to unfold in the new building. For example, the house owners and building companies may configure what kind of living space to devote in the building, what role the kitchen should play in the house, and so on.

In the paper, we carry out an in-depth case study of a Danish planning project called 'Stenløse South', where the local planning authority in the municipality of Egedal, near Copenhagen, has actively made efforts to promote low energy technologies and practices in mainstream building projects of detached one-

family houses. More specifically, we have studied the building process of one of these one-family houses. This study is based on a comprehensive data collection following the planning and building process over several years. Qualitative interviews have been conducted with key actors from the municipality, both planners as well as policy makers, building companies, and private developers of one family houses. Some key actors have been interviewed more times during the process. Furthermore, a survey based on questionnaires has been carried out to further explore the backgrounds and perspectives of the group of private developers. This survey also covers potentially interested buyers that ended up not buying a building lot (Munthe-Kaas et al. 2010). Alongside, the Danish case work was carried out to analyse the planning framework in cases of energy efficient building projects in 4 other European countries (Quitzau et al. 2010).

The house as building – a planning perspective

Through a strategic and reflexive approach, the planning authority in the municipality of Egedal succeeded in facilitating an innovation process that mobilized key actors in the building sector. This includes mobilizing ordinary families and the involved building companies to adopt low energy technologies in the building of the new houses in the new urban area.

The planning process was not straightforward, since this represents the largest development area of mainstream housing (750 dwellings) with low energy efficiency requirements. The planning authority started the project due to frustration of not being able to implement their sustainability targets from the municipal plan in practice, since developers neglected these loosely formulated targets. Following from this frustration, the planners became preoccupied with how to actually implement energy efficient solutions in actual building projects. A new urban development area became a window of opportunity to actually formulate specific visions and to experiment with ways to exert coercion towards developers to implement low energy efficiency technologies. This entails a long and contextually-based planning process (to be shortly described), where the planners reflect and analyse how they may set up low energy efficiency requirements that are tighter than the existing national building regulation. The planners are able to find a loop hole in the existing planning framework, where they buy up the area for the new urban area and re-sell this with certain easements concerning low energy efficiency requirements for the buildings. This concrete manoeuvre made it possible for the planning authority to actually force the developers in the area to consider low energy efficiency.

The next challenge for the planning authority was to ensure that developers would actually accept to build in the area on the given restrictions concerning energy efficiency. In order to ensure this, the planners were aware about not setting the requirements too high and also to meet some of the needs of the developers. As a result, a specific scheme for calculating the required energy efficiency for the new buildings is set up. This is based on the methodology of the existing building regulation, which prescribes a freedom of choice in terms of technologies. The requirement is thus that developers must document that the chosen composition of the new buildings complies with the energy level of so-called low energy class 1 (just above passive house standards). The planning authority facilitates this process by working out instructive information material and by supervising individual building processes, when necessary.

The way that the planning authority has carried out the planning of this process is characterized by being contextual and practical. It reflects a rather technical perception of the house, where emphasis is put on how to compose a building structure, which entails lower energy efficiency than the level prescribed by the national regulation.

The house as home – an everyday life perspective

The building project of the family that we have studied was established as a result of the family wanting to build their new home in this area, mainly due to reasons of economy and location. The family did not

originally wish to build a low energy house and were not part of any green segment of the population, but represents an ordinary family that wants to build a new house. The family engaged a well-known Danish mainstream building company to help them develop the project. The process of designing the house is especially interesting to study, since it reflects how certain low energy technologies were accepted, while others were rejected. In this empirical part, we exemplify this process of selection by accounting for discussions about improving the tightness of the building and choosing the energy system of the building and how these processes relate to conceptualizations of the house as a home.

Approval of increased tightness of the building

The family and the building company chose to increase the tightness of the building in order to comply with the energy efficiency requirements set up by the planning authority. The family agrees with the building company that the thickness of walls, roofs and cellars should be increased. However, the family is especially preoccupied with the thickness of the walls, since they do not wish these to become too thick, since they are afraid that this would inhibit light from coming in. Also, they do not wish to pay extra high taxes because of thick walls (outer walls count in tax scheme) or reduce their indoor floor area. Also, tighter windows are chosen in order to improve the building envelope. These improvements in the building are carried out without further discussions. The family expresses how increased tightness of the building to them represents a benefit, since it prevents draft and keeps a comfortable indoor climate.

Dismissal of an air-to-air heat pump system

Another discussion during the building project concerns the heating system, where the planning authority to begin with required installation of an air-to-air heat pump, which was deemed natural in a low energy building, where very little external energy needs to be distributed due to the low energy consumption of heat of the house. However, in this regard, the family and the building company are very reluctant to accept this technology. Both the family and the building company wish to incorporate a floor heating system in the house, since this is viewed as a normal feature of a modern house. The air-to-air heat pump does not make this possible, since floor heating requires an air-to-water or water-to-water heat pump. This entails an argument with the planning authority about this requirement, and a meeting is established between a number of angry families building in the new area and the planning authority and its consultants. At this meeting, the municipality tries to argue for the advantage and reason for implementing an air-to-air heat pump, while the families argue for the need for floor heating. The outcome of the meeting is that the municipality changes the requirement of an air-to-air heat pump to an unspecified heat pump in order to allow the families to implement floor heating. The family ends up building a house with floor heating based on a water-to-water heat pump.

The empirical case study shows how the family and the building company readily accept one type of low energy technology measure, but rejects another one, and how this is closely connected with orchestrating concepts of the home as a comfortable place. These ideas about comfort support technologies that promote an improved tightness of the home, since draft is prevented. However, ideas of comfort work against an air-to-air heat pump system, since floor heating is expected. The floor heating is viewed as important, since it provides the feeling of warm feet, especially on tiled floor that can feel a little cold. Although the consultants of the planning authority argued that the floor heating would not provide heated floor in practice (because of low demands for energy production in the house), the families still argued for the floor heating system. In this relation, the families especially spoke about the uncertainty of not having floor heating, since this was viewed as a modern commodity, and feared that lack of such a system would diminish the value of their property.

The way that the building process was carried out reflects a different way of conceptualising the house, since more emphasis is put on ensuring a liveable and comfortable home. The discussions about energy

efficiency mainly concern how to implement solutions that interfere as less as possible with the norms of a modern house and the daily practices of the family.

Mediating between energy efficiency and comfort of the home

The case study shows how the planning authority is faced with strong conceptions about the house as a home, and that these conceptions are difficult for the authority to break, since the family and the building company strongly feels about ensuring certain features in the home. This illustrates that even though the planning authority has actively made efforts to explain, coerce force and facilitate the process, it was not possible to push through certain low energy technologies in the building project.

Another important point is also that the process did not articulate the need for energy efficient practices in relation to the daily use of the house. Rather, the planning authority self-censured such initiatives by emphasizing the need to target mainstream buildings, and as a consequence aimed at changing as little as possible in the daily life of the families in the new area, except from the building structures. This represents an important issue, since promotion of low energy buildings also relates to the energy used during usage.

The case study indicates that the planners in the planning authority to a great extent recognize and acknowledge the social challenges related to promotion of low energy housing. However, it seems that the planners are not able to translate or materialize their visions of energy efficiency into specific planning measures that may ensure a more radical shift in building structures and daily practices. Instead, we experience a rather practical and contextual planning process, where planners identify windows of opportunity and draw upon available instruments.

Bridging between the conceptualization of the house as a building and a home

A key question is how planners could to a greater extent mediate between energy efficiency and comfort so that more radical initiatives could be implemented in practice. According to Shove (pers. comm.) it is important to recognize that it might be possible to script users to do differently or to promote practices that are not so resource intensive as attractive alternatives to resource intensive practices. This would require that planning authorities become better trained in bridging between the conceptualization of the house as a building and a home.

References

Insert references.