

Abstract

The environmental and social challenges humanity is facing today will require a variety of shifts, also called socio-technical transitions, to new kinds of energy, mobility, housing, and food systems. These transitions involve not just changes in technology, but also systemic changes in consumer practices, policies, cultural meanings, infrastructures, and business models, see Fig.1. (Geels, 2018) The emerging field of 'design for sustainability transitions' aims at providing the theoretical background for such systemic transitions in design. It is also design practice itself that needs a transition by allowing for more systematical and strategic experiments with new ways of thinking, organizing and working in and with design. (Mulder, Loorbach, 2018)

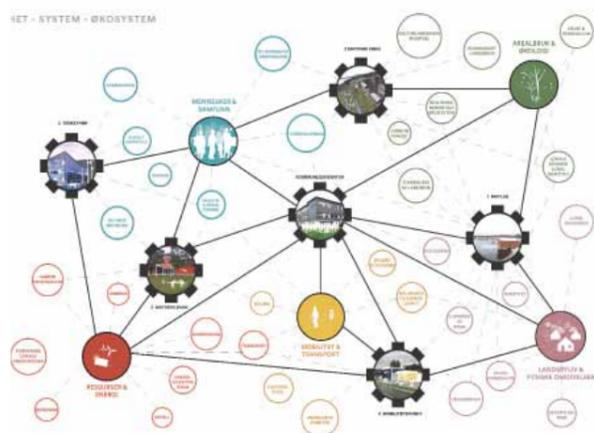
The architecture firm Pir II AS that the author is employed by has recently established an R&D unit with a focus on sustainability transitions. The doctoral dissertation sets out to explore and define the possible scope of action available for practicing architects in advancing sustainability transition in the built environment.

The work intends to use and customise the practice-led research methodology to best fit the purpose of advancing both theoretical and practical knowledge with efficient feedback loops between them. Practice-led research is seen as very relevant since it is concerned with the nature of practice and leads to new knowledge that has operational significance for that practice. (Candy, 2006) It also accommodates for iterative, open-ended processes, and insights resulting from unexpected outcomes of action. (Stapleton, 2005)

The research methodology of the dissertation intends to combine design approaches relevant for sustainability transitions in the built environment developed from a literature review with implementing and testing selected approaches in a variety of cases in the company during the dissertation period. Due to the large variety of possible design tasks linked to sustainability transitions (see examples of potential cases below), there is a need for flexible modes of investigation and data collection. A common framework for analysing the different cases can come from action research process characterized by cycles of action and research consisting of four phases: plan – act – observe – reflect. (Zuber-Skerritt, 1992)

Each case has a different starting point and trajectory along the transition potential axis (see Fig.1). The aim of the work is to assess the applicability of the practise-led research as a method to maximise the transition potential of the cases through strategical and experimental design.

Ongoing cases - exploring pathways for sustainability transitions



Living Lab Oppdal: nature-based leisure

On average, cabins in Norway are used 40 days a year, are little energy efficient, and require more infrastructure as comfort levels increase. The project includes co-creating and visioning workshops with the aim of defining possible pilot projects that would advance transition towards more resource-efficient practices and infrastructures for nature-based leisure activities. Project is supported by DOGA Design-driven-innovation program.



Selbukassa: reuse + affordable housing

A self-built house for four families in Svartlamon, an experimental area for urban ecology in Trondheim, with focus on reusing buildings materials, e.g. a 90-year old log building, windows, doors, roof and wall claddings. Reuse allows to keep building costs low, thus increasing affordability and providing an alternative to the market-dominated housing in Norway. Possible environmental benefits in the form of GHG emission savings from reuse are also estimated.

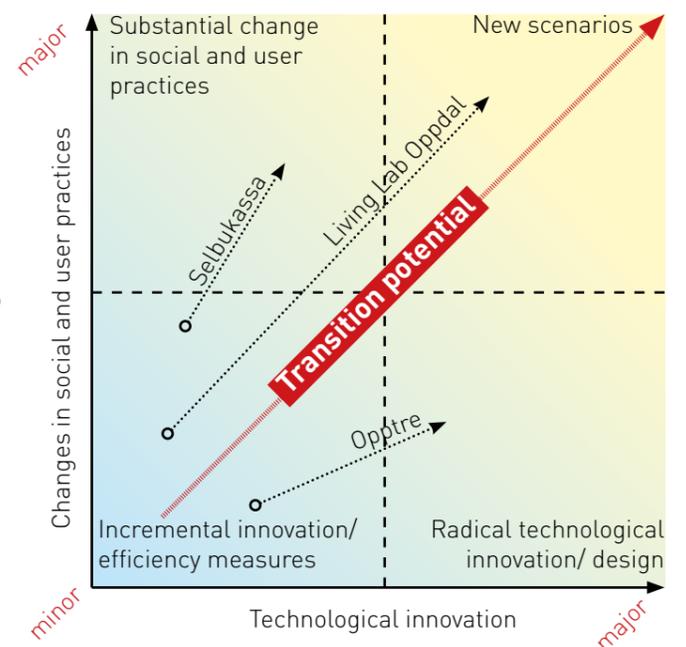


Fig. 1 Framework for mapping design approaches for sustainability transitions (adapted from Dusch, 2010 and Geels et al, 2018), with ongoing cases placed within the framework

References

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Opptre: upgrading single family homes

There are 1,2 million single family homes in Norway, many of which have a high energy consumption and are in a need of refurbishment. The architecture competition was initiated with the aim to identify nZEB (nearly zero energy level) concept designs that have high architectural quality, are cost-efficient and low-carbon. In addition, our team aims to challenge area efficiency (m²/pers), while providing for more spatial quality. Partners in the project are NTNU, SINTEF, ENOVA and several industry partners.