THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

A SUSTAINABLE HOME?
RECONCEPTUALIZING HOME IN A LOW-IMPACT SOCIETY

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ABSTRACT

This thesis addresses the environmental and socio-economic impact of modern ways of living, focusing on home-related concepts and practices for transitions to a less environmentally harmful and more socially just society. Exploring diverse conceptualizations of a *sustainable home*, the aim is to broaden discourses on less resource-intensive ways of living and residing.

Employing a primarily qualitative and explorative research approach, the thesis presents three empirical studies on how sustainability in housing and concepts of home are perceived among different actors: 1) developers and architects involved in a new "green" urban development; 2) "ordinary" residents in a tenant-owned multi-family housing association; and 3) "home-front transitioners" engaging in low-impact practices. The findings highlight the complexity of approaching a sustainable housing development. On one hand, the empirical insights reveal structural lock-ins in mainstream market-led development, with a techno-centered view of sustainability, conventional understandings of residents' preferences and household configurations, and lack of competence regarding social dimensions. On the other hand, there appears to be a gap between a reported interest among residents in living in less resource-intensive ways (including living smaller, simpler, or more collaboratively), and relevant alternatives within the current housing market.

Attempting to find ways of going beyond these unilateral interpretations and lock-ins, the thesis suggests conceptualizing home as a node, framing understandings of home and everyday practices as a starting point for transitions to a low-impact society, rather than seeing the dwelling as an object upon or in which sustainable technologies and solutions can be placed. This is further linked to exploring agency in and of the home, acknowledging residents as active agents rather than "end-users" or consumers.

In conclusion, the thesis emphasizes the need to problematize contemporary discourses on sustainability in housing. It makes a case for the need to rethink how we view home in relation to a radically reduced resource intensity, proposing a reconceptualization of home in transitions to a low-impact society.

Keywords: home, housing, sustainability, transition, low-impact, social practices

PREFACE

The doctoral work presented in this thesis was started in September 2011 within a "strong research environment" called "Homes for Tomorrow", funded by the Swedish Research Council Formas, and hosted by the department of Civil and Environmental Engineering at Chalmers University of Technology, in collaboration with the department of Architecture. The research environment was based in an aim to support the development of new technologies, materials and spatial structures that radically reduce resource and energy intensity in domestic environments. The work conducted within this project relates primarily to the study presented in Papers A and B (including additional research as outlined in a Licentiate thesis entitled *Interpreting the Sustainable Home – Bridging discourses on home and sustainability in the housing sector*, presented at Chalmers in June 2014), and in part also to a second study, corresponding to Paper C.

As the Homes for Tomorrow project came to an end in 2014, and several members of the research team transitioned into a project within the EU funded Climate-KIC program, I was instead drawn to and offered a chance to work in another Formas funded strong research environment called "Beyond GDP-growth: Scenarios for sustainable building and planning". This project is hosted by KTH Royal Institute of Technology, in collaboration with researchers at the Swedish Environmental Research Institute (IVL), The Swedish National Road and Transport Research Institute (VTI), Lund University, Södertörn University and the Swedish Agency for Growth Policy Analysis. It takes a different approach than the Homes for Tomorrow project, exploring trajectories for Swedish society in future scenarios where economic growth is no longer a given (or necessarily desired), with the overall objective to explore implications for policy and planning. The work conducted within this project corresponds to the study presented in Paper D.

The doctoral work presented here should hence be understood as a mediation between two quite different research contexts that this thesis is the result of. In addition, I have had the pleasure to collaborate with and advise on a project called "Cohousing and sustainable urban development: cases from Denmark, Germany, Spain and Sweden", hosted by University of Gothenburg. All of these research projects have addressed questions of a sustainable built environment from a cross-disciplinary approach, although in slightly different ways, and should be recognized as part of a larger societal interest in and targeted funding for the topic, lined with both paradoxes and possibilities.

LIST OF PAPERS

This thesis is based on the work contained in the following papers:

PAPER A

Hagbert, P., Mangold, M., & Femenías, P. (2013). Paradoxes and Possibilities for a 'Green' Housing Sector: A Swedish Case. *Sustainability*, 5(5), 2018-2035. doi: 10.3390/su5052018

PAPER B

Hagbert, P., & Femenías, P. (2016). Sustainable homes, or simply energy-efficient buildings? *Journal of Housing and the Built Environment, 31*(1), 1-17. doi: 10.1007/s10901-015-9440-y

PAPER C

Hagbert, P. (2016). "It's Just a Matter of Adjustment": Residents' Perceptions and the Potential for Low-Impact Home Practices. *Housing, Theory and Society*. doi: 10.1080/14036096.2016.1141797

PAPER D

Hagbert, P. & Bradley, K. (submitted). Transitions on the home front: another narrative of sustainable living. *Manuscript submitted for scientific journal publication*.

ADDITIONAL PUBLICATIONS AND COLLABORATIONS

SCIENTIFIC JOURNAL PUBLICATIONS, AS CO-AUTHOR

Mangold, M., Morrison, G., Harder, R., Hagbert, P. & Rauch, S. (2014). The transformative effect of the introduction of water volumetric billing in a disadvantaged housing area in Sweden. *Water policy 16*(3), 973-990.

Femenías, P., & Hagbert, P. (2013). The Habitation Lab: Using a Design Approach to Foster Innovation for Sustainable Living. *Technology Innovation Management Review* (November 2013: Living Labs), 15-21.

CONFERENCE PAPERS, POSTERS AND ABSTRACT PRESENTATIONS

Hagbert, P. (2015). Conceptualizing the sustainable home - Explorations of alternative home practices, Abstract presented at the CIB W069 Meeting "Explorations on Residential Qualities: Situations of Dwelling, Ageing and Healthcaring. Inquiries of Transdisciplinary Nature", 14-17 October, 2015, Gothenburg.

Hagbert, P. (2014). Reconceptualizing the sustainable home - Exploring the potential for alternative home-related practices, Poster presented at ESRC seminar on Collaborative Housing and Community Resilience, 11-12 December, 2014, Newcastle upon Tyne.

Hagbert, P. ; Renström, S. (2014). Residents' perceptions of housing and resource use: A comfortable home?, Extended abstract presented by Hagbert at the 23rd IAPS Conference, 24-27 June, 2014, Timisoara.

Bannova, O., & Hagbert, P. (2014). Experiments in mapping human factors for sustainable design and living. In R. García Mira & A. Dumitru (Eds.), *Urban Sustainability: Innovative Spaces, Vulnerabilities and Opportunities* (pp. 117-130). A Coruña: Institute of Psychosocial Studies and Research. [Post-conference publication]

Bannova, O., Nyström, M., Femenias, P., Hagbert, P., & Toups, L. (2014). Testing and evaluating sustainable design practices. Paper presented by Femenías at the International Conference on Architectural Research ARCC/EAAE, 12-15 February, 2014, Honolulu.

Hagbert, P., Femenias, P., Nyström, M. & Zuber, G. (2013). BEYOND GREEN - the unsustainable home in the environmentally adapted building. Paper presented by Hagbert at the 10th European Academy of Design Conference - "Crafting the Future", 17-19 April, 2013, Gothenburg. [An earlier version of Paper B]

Hagbert, P., Femenias, P., Nyström, M. & Zuber, G. (2012). The unsustainable home in the environmentally adjusted residential building?, Abstract presented by Hagbert at the 56th International Federation of Housing and Planning World Congress; 16-19 September, 2012, Gothenburg.

Hagbert, P. (2012). Evolving the definition of home - adaptation of a concept in a global resource perspective, Extended abstract presented at the 22nd IAPS Conference, 24-29 June, 2012, Glasgow.

Mangold, M., Hagbert, P., Renström, S. & Selvefors, A. (2012). Who benefits? Effects and perceptions of residential volumetric water billing, Extended abstract presented by Mangold at the 2nd Nordic Conference on Consumer Research, 29 May-1 June, 2012, Gothenburg.

Mangold, M., Hagbert, P., Renström, S. & Selvefors, A. (2012). Reducing water consumption, Poster presented by Hagbert at the 1st RESPONDER Knowledge Brokerage Event on Sustainable Housing, 28-30 March, 2012, Barcelona.

POPULAR SCIENTIFIC PUBLICATIONS

Bradley, K. & Hagbert, P. (2015, 22 March). Dags att syna idén om den täta hållbara staden [Time to examine the idea of the dense sustainable city]. *Göteborgsposten*.

Hagbert, P. (2014). Hur ska vi bo egentligen? [How should we really live?]. Archileaks editorial material, www.archileaks.se.

Hagbert, P. (2013). Den gröna byggbranschens paradox [The green building sector's paradox]. In S. Tengroth (Ed.), *Att svära i kyrkan: tjugofyra röster om evig tillväxt på en ändlig planet*. (pp. 206-217). Gothenburg: Tillväxt-reflektera.

Femenias, P., Hagbert, P., & Persson, E. (2013). Få möjligheter att utmana det som byggs idag [Few opportunities to challenge what is built today]. *Arkitekten* (6-7), p. 62.

Hagbert, P. (2013). Byggbranschens gröna paradox [The green paradox of the building sector]. Archileaks editorial material, www.archileaks.se.

In addition, popular scientific accounts of the research have been covered in various media outlets, including national radio, web publications and print newspapers/magazines. The work has furthermore been presented to various stakeholders from policy, the public sector and practice on a municipal, regional and national level.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

1.   INTRODUCTION

1.1. BACKGROUND

1.1.1. AT HOME IN A SUSTAINABLE BUILT ENVIRONMENT

This thesis places a focus on the development of residential environments, and particularly the home, as a node for transitions to a less environmentally harmful and more socially just society, referred to here as "low-impact" ways of living. Exploring conceptualizations of a sustainable home, the work presented here argues that merging and contrasting discourses on home and sustainability is of value not only in finding strategies for reducing resource use in residential buildings, but also in rethinking how we live and conceive the "good life" and the "good home" altogether.

The resource intensity and metabolic profile associated with contemporary modern industrialized societies is high (Krausmann et al., 2008). Issues of escalated resource depletion, climate change, injustice, economic and political turbulence, and urban population growth are increasingly recognized as interlinked global and local challenges. Seeking to gain a deeper understanding of these problems furthermore outlines their "wicked" character (Rittel and Webber, 1973). As we face a multitude of issues, ranging from climatic to social, it is pertinent to acknowledge the links among societies, economies, and people, and moreover how this is based in exploitation and distribution of resources, whether natural, politico-economic, or socio-cultural.

How we organize society shapes and is shaped by the constructed environments in which human activities take place. Our understanding of the world relies on these structural and organizational processes, which are in turn supported by resources (land, water, materials, and energy), time, and human ingenuity. This thesis is based on an assumption that we ought to acknowledge the prevailing conceptualizations of home, as one facet of how we construct relations to and meaning in the built environment, in striving for a socially just development within planetary boundaries. As explored in interpretative accounts of the attributions given to space and place (Moore, 2000), home carries strong connotations in everyday life, forming a viewpoint of the world. How we construct our homes (physically, socially, and cognitively) is furthermore instrumental for the environmental, social, and financial impact of residential development.

While the transdisciplinary field of sustainability science (Komiyama & Takeuchi, 2006) has been gaining scholarly acclaim in recent decades, the now widespread political concept of sustainable development nonetheless continues to be rather vague or unilateral

when operationalized in planning and building. As environmental awareness in the housing sector continues to increase, it appears relevant to explore the framing of sustainable housing, not least with regards to the various (cognitive and concrete) images of what a sustainable home and way of life would actually entail. However, difficulties arise in trying to merge contrasting or even oppositional agendas for a sustainable housing development, where theoretical development has previously lagged behind (Brown & Bhatti, 2003). This includes complex issues regarding, for example, increasing wealth versus rising inequality, the pursuit of a convenient modern lifestyle versus the need to reduce overall resource consumption, or strengthening local resilience and community versus adapting to changing needs for global mobility (Lovell, 2004; Brown & Bhatti, 2003; Raco, 2007).
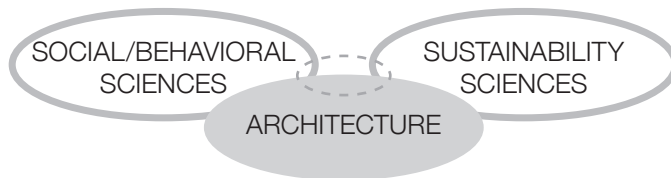
Figure 1. Bridging disciplinary boundaries for integrated research

In order to address these conflicts and the convergence of socio-cultural, economic, and resource implications, exploring (and contrasting) different perspectives to diversify discourses appears essential. Seeking an integrated approach to these issues also implies bridging, or even transcending, disciplinary discourses (Després, Vachon & Fortin, 2011). This thesis links what is here seen as key disciplines in research on sustainability in housing (see figure 1). While planetary boundaries provide absolute biophysical limits (Rockström et al., 2009), such a framework needs to be related to what people do, and why, underlining the importance of understanding cultural, social, and psychological processes in relation to materialities of people's lives. The need to continue the cross-disciplinary development of sustainability sciences by further integrating social and behavioral sciences in research on energy and resource use has been stressed (Ellsworth-Krebs, Reid & Hunter 2015; Sovacool et al., 2015). The specific disciplinary setting of an architectural department moreover provides this thesis with a pragmatic starting point, going beyond the often more descriptive character of natural and social sciences to also emphasize the transformative potential of design research in conceptualizing alternative images and futures.

1.1.2. CONTEMPORARY HOUSING DEVELOPMENT

The environmental impact associated with the built environment is significant, and greenhouse gas emissions from buildings are expected to rise (IPCC, 2014) linked to increased wealth, lifestyle changes, and urbanization worldwide. "Better construction and use of buildings" is recognized by the European Commission (2011:18) as having the potential to "influence 42% of our final energy consumption, about 35% of our greenhouse gas emissions and more than 50% of all extracted materials." Housing (in an EU definition specified as buildings, furniture, domestic appliances, and room and water heating) is further estimated to account for about 20-35% of the total environmental impact caused by consumption in the EU (JRC, IPTS & ESTO, 2006). Similar to many other Western countries, 40% of total energy use in Sweden is attributed to the sector "housing and services", with residential heating accounting for approximately 15% of national energy use (the Swedish Energy Agency, Energimyndigheten, 2014a & b).

Beyond technical performance, unsustainable financial and social structures reproduced in contemporary housing development, including issues related to equal access and diversity in the housing market, will also need to be tackled. Several demographic, regulatory and normative trends can be noted to influence the conception and production of housing, and while the focus is here on a Swedish context, similar patterns can be observed across the global West/North. Aspects of growing individualism and demographic change, such as to an aging population and increased mobility (of choice in a globalized work sphere or of necessity as a consequence of global conflicts or climate change), have a direct influence on housing demand. The number of single-person households has increased in Sweden, and today accounts for about 50% (SCB, 2012).

Sweden has a relatively young housing stock, with about 60% built after 1960 (SCB, 2012). An overall high rate of development and improvement of living conditions during the 20th century included significant increases in spatial standards. While less than a tenth of the population in the mid-60s lived in what was considered a high spatial standard, today the number is around 40% (SCB, 2012). Hidden behind these numbers, however, is the increasing disparity between those in Swedish society who live in overcrowded conditions and those with a significantly higher standard of living and level of consumption.

Following a partial deregularization during the 1990s, the market has increasingly been given responsibility for the provision of housing in Sweden (Turner & Whitehead,

2002; Lind & Lundström, 2007)—a matter that has been continuously revisited in current debates on the state of Swedish housing development (Kaplan, 2015; Lennebo, 2016). In a European perspective, Swedish households spend a large portion of their disposable income on housing (Boverket, 2010), and while this indeed should be discussed in light of the high living standards acquired, it nonetheless means that groups with less financial power in this market are especially disadvantaged when it comes to finding housing.

The discourse among market actors, politicians, and the public media during the last couple of years has focused on a lagging production rate (and suggested related causes) where the stated housing shortage is framed not only as a social issue but as a threat to continued growth in urban areas (Lago & Linde, 2013). The tension between ambitions for an environmentally conscientious housing development on one hand and a reported housing shortage on the other is apparent. The Swedish building industry, through its interest organization (the Swedish Construction Federation), has pushed and continues to lobby for streamlined regulations and the disbanding of specific local environmental requirements (Brogren & Wellhagen, 2012)—something that was also enforced following a government report on "Increased housing construction and coordinated environmental requirements, through uniform and predictable building regulations" (Hedlund, 2012). Simplified building regulations and shortened planning processes are seen as key policy tools to increase production rates. This could nonetheless be argued to propose the very opposite of commonly suggested strategies and means of achieving more sustainable development of the built environment, such as sharpened environmental regulations (including taxation) and more extensive (rather than shortening or restricting) participatory planning processes.

1.1.3. KNOWLEDGE GAP

This PhD work is positioned in an under-explored area between disciplines occupied with studying either the psychological and socio-cultural meanings of home or the environmental consequences of residential buildings (as illustrated in figure 2). The field of building research, to which this thesis in part belongs, tends to offer a pragmatic approach of utilizing relevant theories as they apply to the built environment, rather than pursuing a more rigorous theoretical development found in other areas of housing research (to which the PhD work could also be said to contribute). The thesis thus provides a gathered cross-reading of what could be seen as a fragmented research field, to inform a more overarching

DISCOURSES
ON HOME

integration of environmental aspects?

LACUNA

integration of perspectives on home?

DISCOURSES ON
SUSTAINABLE
BUILDING
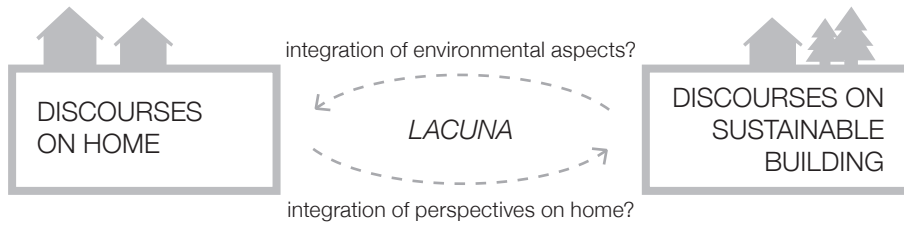
Figure 2. Research focus and identified knowledge gap

discussion and synthesis by utilizing separate yet linked theoretical strands. This provides a framework for empirical insights presented here, but also proposes an integrative perspective on sustainability in and of the home (as a concept and a place).

Residential perspectives and perceptions, relations and practices of home have long been emphasized in Swedish architectural research, and particularly in the Department of Architecture at Chalmers a socio-cultural understanding has been prominent (to which this thesis can be seen as an addition). Previous work in the department, for example, has addressed critical perspectives on co-housing (Gromark, 1983), meanings of home among residents in renewal processes (Hurtig, 1995), and architectural qualities influencing perceptions of homes (Nylander, 1998). As outlined further in Chapter 3, precedent research on the concept of home can moreover be found within several disciplines, such as psychology, sociology, anthropology, geography, urban planning, and architecture (with previous research in a range of fields including just to name a few, Saunders & Williams, 1988; Després, 1991; Benjamin, Stea & Arén, 1995; Marcus; 1995; Moore, 2000; Perkins et al., 2002; and Blunt & Varley, 2004). Although interdisciplinary efforts have developed further in the decade since Mallet's (2004) well-cited review of home research—which found studies to be generally limited to particular dimensions of home within the own disciplinary sphere—the challenges of trying to integrate various complementing disciplinary perspectives as raised by Altman and Werner already in 1985 appear to remain.

Furthermore, explorations of home in relation to notions of sustainability have been lacking in more conventional home research, including ecological dimensions of meanings of home (Coolen, 2006). Conversely, within mainstream discourses in the building sector and in sustainable building research, various socio-cultural and emotional-relational notions of home and practices in relation to home have often been overlooked in the development of resource-efficient residential solutions, where the focus has instead been

on techno-economic understandings of resource flows and systems (Ellsworth-Krebs, Reid & Hunter, 2015). This thesis is thus based on assumptions of the need to further explore concepts of home and ways of residing in relation to the environmental and social impact of contemporary housing, in accordance with the work of, for example, Jensen (2001), Chiu (2004), Aune (2007) and Støa (2008), and many others.

1.2. RESEARCH SCOPE

1.2.1. AIM AND RESEARCH QUESTIONS

As described in the previous section and further outlined in the following chapters, this thesis intends to bridge research on concepts of home and sustainability in housing.

The aim of the work is to:

> Broaden discourses on low-impact ways of living and residing by exploring conceptualizations of a "sustainable home".

The research questions posed are iterative and interlinked:

1) What interpretations of sustainability and concepts of home are prevalent in contemporary housing development?

2) How do these interpretations and concepts differ and/or pose conflicts between different actors' perspectives, and in relation to overarching environmental and social goals?

3) How might different conceptualizations of home relate to the potential for transitions to low-impact ways of living?

1.2.2. SCOPE AND DELIMITATIONS

Many actors influence and are influenced by the issues raised in the thesis. These include housing companies (private, public, or cooperative) and those engaged in the planning, design and construction of housing (such as urban planners, architects, engineers, developers, and builders). But these issues also concern the public entities responsible for planning and development (such as city planning departments or regional development programs), housing authorities, environmental agencies, policy makers on various levels, and of course residents' organizations and other civil society interest organizations. While these various actors might find different parts of the empirical findings interesting, specific target groups and the scope of the research presented is delimited in relation to the aim.

This thesis makes assumptions regarding patterns of resource and energy use in relation to everyday practices and socio-cultural meanings, yet does not address more quantitative measures such as greenhouse gas emissions. Nor does it go deeper into questions of housing policy or legal dimensions. While the thesis thus does not concretely outline how sustainability in housing can be achieved in terms of specific policy or planning actions, it deals with the images and concepts we have of a sustainable home, which shape what is perceived as possible or desirable. On one hand this makes the thesis particularly relevant for actors that are understood to more directly shape concepts as translated into the built environment (still including a wide range of actors, from development managers at housing companies to architects). On the other hand, a more abstract aspect is also that the work deals with questions that ultimately lie beyond the scope of any single actor, challenging ways of modern society and life that cut across sectors. This includes being open for potential alternative actors that might not be involved in current mainstream housing development, but could be relevant in the search for new trajectories for a low-impact society.

Through primarily qualitative, in-depth explorations, the material presented here revolves around three empirical studies that explore relations, perceptions and opinions among different actors in order to diversify discourses on sustainable housing development. The studies have focused on: 1) interpretations of sustainability in relation to concepts of home as expressed by actors in the housing market, exemplified in the urban redevelopment of Kvillebäcken in Gothenburg (corresponding to papers A and B); 2) perceptions of low-impact living among "ordinary" residents in a tenant-owned housing area in Gothenburg (corresponding to paper C); and 3) "home front transitioners" engaged in low-impact home practices in the semi-rural context of Alingsås (corresponding to paper D). This empirical geographical delimitation to western Sweden acknowledges the potential particularities of the Swedish housing situation. Yet the discussion is considered relevant even in a more general northern/western context of similarly high-metabolic, affluent societies.

1.3. THEORETICAL FRAMEWORKS AND KEY CONCEPTS

The ontological and epistemological basis for this PhD is derived from several perspectives. Key frameworks and concepts used in the thesis are here introduced to provide a brief theoretical orientation. The main theoretical areas, relating to the identified need to merge discourses on sustainability and home, are then elaborated further in Chapters 2 and 3.

The positioning of architectural research, in relation to the formation of a unified philosophy of science, is renegotiated constantly (Mo, 2003). Architecture as an applied science, and furthermore a "making discipline," engages with the physical or organizational manifestation of research and practice in the built environment, and is open for a multitude of routes for the creation, validation, and redevelopment of knowledge. This thesis challenges the techno-centered focus of sustainable building research and argues for the integration of critical approaches to inform the direction of *why* and *what* is to be developed. As such, the work relates to a trans-disciplinary approach to applied knowledge production (seeing knowledge as co-created in practice, even outside of academia), yet supported by intra-disciplinary expertise on the specifics of *how* (Gibbons et al., 1994; Nyström, 2002; Després, Vachon & Fortin, 2011). Following a trajectory in design research (of which architecture is here seen to be part), a central assumption is moreover that "a design-based knowledge paradigm can contribute meaningfully in situations of unsettlement" (Janssens, 2012:183). This particularly applies in the context of handling the types of "wicked" problems (Rittel & Webber, 1973) that could be said to characterize a sustainable housing development.

The thesis follows a pragmatic approach in that it questions essentialist notions of how things "really are" (inherent characteristics that could be unearthed), and instead focuses on situated empirical insights that explore life as "constantly emergent, experiential and experimental" (Hobson, 2006:284). This pragmatism is here employed in seeing theory as useful simply until it isn't. More directly, theoretical frameworks are seen as useful in approaching an understanding, but upholding or disproving theories is not considered a goal in and of itself. Rather, the potential overlaps and paradoxes posed are seen as points for exploration in relation to the empirical material. This further links to Gibson-Graham's (2014) problematization of "strong theory," which calls for resistance to powerful discourses that perpetuate a supposed usefulness and need to adhere to comprehensive theories of global structures and inherent system properties. Such a perspective allows for a critical stance towards dominant frameworks or ideologies that might restrict us to unsustainable trajectories (such as economic theories based on rational choice models).

A primary framing for this thesis with regards to the background presented above is the concept of *sustainability* (discussed further in Chapter 2), here used to signify a myriad of theories and efforts regarding the balance between environmental management and global social development. This ties in to recent developments that try to define a safe

operating space for humanity within planetary boundaries (Rockström et al., 2009; Steffen et al., 2015), but it also acknowledges the essentially political question of the distribution of resources within this space. An underlying belief pursued in this thesis is the need to mitigate greenhouse gas emissions and further reduce the rate of depletion of natural resources by linking absolute reductions in resource use and demand to socio-cultural dimensions (Sanne, 2002).

This also provides a basis for what is here meant by a *low-impact society*, i.e. one that keeps within planetary boundaries, seeking to reduce the environmental impact (in absolute terms, relating not only to carbon footprint, but also encompassing land use, materials and other natural resources and capacities of the ecosystem) of the activities that take place within society (including forms of production and consumption, and essentially how we organize our lives). Yet (perhaps paradoxically) the term is here also used to signify a development towards a more positive social impact, emphasizing a perspective of socio-environmental justice. In this regard, the thesis is positioned in relation to increasing scholarly and societal criticism of growth-based understandings of development, and to ongoing discussions of degrowth alternatives (D'alisa, Demaria & Kallis, 2014), understood as the equitable downscaling of production and consumption levels to enhance ecological conditions and the possibilities for human wellbeing (Schneider, Kallis & Martinez-Alier, 2010).

This in turn is linked to another term, *transition*, used to signify the substantial societal change needed to meet the challenges posed by normative goals for a more just and less resource-intensive way of life. While theories on sustainability transitions and management are gaining prominence (Geels, 2010), this thesis does not go deeper into that particular theoretical framework. Instead the term is used to denote transitions as understood in practice, outlining pragmatic and conscious strategies for shifting modes of production and consumption and ways of living with an emphasis on the local scale, as presented in the transition movement (Hopkins, 2008).

Orienting within social theory (as understandings of society) and reflecting the merger of perspectives employed in this thesis, structuration theory is found to provide an interesting starting point for exploring the mediation and intersection between individual agency and social structures in daily life (Giddens, 1984). In line with this approach, the thesis is rooted in theories of social practice (Bourdieu, 1977; Reckwitz, 2002), and especially the formulation of practice theory in relation to transitions to more sustainable ways of life and

society (Shove & Walker, 2007; Shove & Walker, 2014). *Practices* are here understood as patterns of action, bringing together cultural assumptions and socio-material relations that are reproduced as part of "doing" things in different ways at different times.

A principle of practice theory, following Reckwitz (2002) and Shove, Pantzar and Watson (2012), is the relation to the "stuff" or artifacts we use as a part of everyday life. As outlined by Shove et al. (ibid), an understanding of social practices can be framed as consisting of three elements: 1) material stuff involved (appliances, instruments or equipment); 2) competency required in the performance of practices (knowledge, skills and oftentimes routinized "embodied" know-how); 3) meanings for engaging (significance of practices, beliefs and images that influence why we do things in certain ways or why we do them at all). This perspective on elements of practice as linking the social and the material is utilized in this thesis in regards to practices that take place in or could be seen as key in shaping home (discussed further in section 3.3). It explores concepts of home and home-related practices in relation to both the meanings and habits they presume, and the spatial prerequisites, material standards, and artifacts of different residential environments.

Home is here seen as differing from a more physical connotation of house and encompasses also the personal, psychological, social, or cultural meaning of a dwelling place (Hauge & Kolstad, 2007). Another key term used throughout this thesis is *conceptualization*, defined as the process of forming an idea or general notion of something. The *conceptualization of home* as it is used here thus entails the understanding, perception, and imagery—i.e. the cognitive constructs shaped in, of, and through the home. Conceptualizations are yet also understood as being part of and continuously reproduced in (social) practices, formulating concepts into physical form, linking to the material manifestation of what home "is" and looks like. Processes of conceptualization are thus further seen as being reflected in the formulation of architectural or housing "concepts" as (more or less) concrete representations.

Discourses are here defined as written and spoken expressions within certain socio-cultural contexts that form a general frame of reference (Fairclough, 2010). Finally, the thesis addresses different *actors*, referring to those concerned in housing development, where the term actor could be defined as someone (individual or organization) that acts, or more passively as someone upon whom others act (Latour, 1996). The term is here distinguished from a more active implication of *agent* as someone with explicit *agency*—the ability to act and create change—rather than merely being affected or involved implicitly.

1.4. THESIS STRUCTURE

This thesis "cover essay" is structured into three parts and comprises seven chapters (see figure 3). The first part presents the background and theoretical framework, the second summarizes the empirical studies, and the third consists of discussion and conclusions for further development.

Following this introduction, Chapter 2 describes a theoretical framing of sustainable development in relation to efforts within the built environment, exploring societal, environmental, and household implications. Chapter 3 then further presents theoretical frameworks on the concept of "home" relating to meanings, norms, and ideals in housing development.

In Chapter 4, the empirical material and methods are detailed further, including summaries of the methodological approach of the three studies. Chapter 5 proceeds with a summary of results and offers an additional contextual analysis of the three studies.

Chapter 6 discusses the main findings in relation to the theoretical framework of the thesis and proposes a framing of the sustainable home in transitions to a low-impact society. Conclusions from my PhD work as a whole are then drawn in Chapter 7, summarizing implications and recommendations for further development and research.
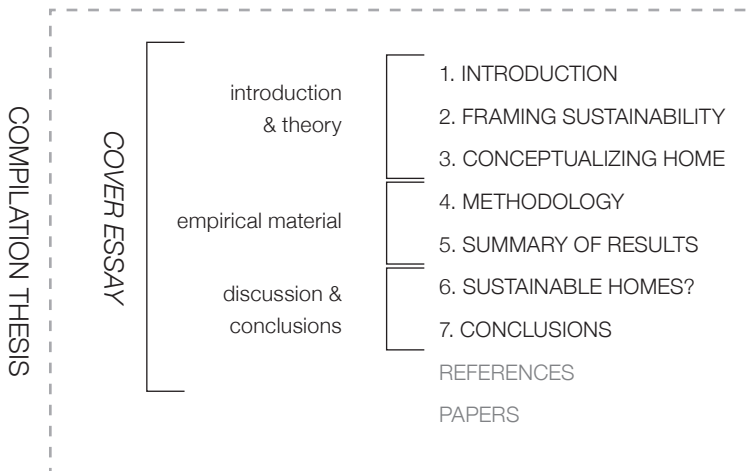
Figure 3. Structure of the thesis

2.   FRAMING SUSTAINABILITY

This chapter, along with Chapter 3, provides theoretical outlines and an orientation for the empirical material and discussion pursued in the thesis. The chapter gives an overview of how concepts of sustainability are framed and how this is related to ways of living. The following sections examine political concepts and mainstream notions of sustainable development and understandings of just housing development within planetary boundaries, explore the complexities of policy and operationalization in the built environment on sustainable housing, and finally problematize a framing of household consumption and home-related practices in relation to calls for local community on one hand and more structural societal change on the other.

2.1. SUSTAINABLE DEVELOPMENT

2.1.1. POLITICAL CONCEPTS AND INTERPRETATIONS

The concept of sustainable development has come to be referenced increasingly in mainstream discourse over the last decade, and now holds a prominent role in much policy rhetoric. Yet the term offers multiple interpretations and applications, including in sustainability science research (Wiek et al., 2012). A simplified breakdown of this in essence political concept that aligns with common understandings of the term (echoing the original wording from the *Brundtland Report*, WCED, 1987), refers to an equitable balance between what is to be developed (societal advancement), what is to be sustained (natural and social capital), and linking this to a time perspective, often portrayed as intergenerational equity (Kates, Parris & Leiserowitz (2005).

While mid-twentieth century preservationist movements based a growing concern for the environmental impact of human endeavors on an ecocentric and "deep green" advocacy (Carson, 1962, Merchant, 2005), later discourses under the umbrella of sustainable development (WCED, 1987) tend to take an anthropocentric perspective (Gagnon Thompson & Barton, 1994). In a largely post-colonial understanding of social development (Loomba, 2005), the Rio Conference of 1992 marked a move among the global community towards how to sustain this normative framing of development within what was increasingly recognized as limited ecological boundaries (WCED, 1987).

Today's mainstream discourse is characterized by notions of "weak sustainability" within an ecological modernization framework, emphasizing economic growth and a modernist worldview that presupposes the use of science and technology to change the world and

improve life. This is paired with a dominating belief that technology can solve present and upcoming problems related to environmental degradation, and that economic growth can be decoupled from resource use and waste generation (described, for example, in the European Commission Roadmap to a Resource Efficient Europe, 2011). Reproducing an idea of development as intrinsically tied to economic growth, supposing the merger of a contemporary growth paradigm with environmental preservation or regeneration and societal prosperity, is framed within the term "green economy" (as seen at the Rio+20 summit). The UN Sustainable Development goals further establish economic growth as a goal in and of itself (rather than a means, it is posited as one of the seventeen goals to "transform the world" and "banish a whole host of social ills by 2030" (UN, 2015).

The premise of the work undertaken in this thesis positions planetary boundaries (Rockström et al. 2009; Steffen et al., 2015) as absolute limits for the capacity of ecological systems to produce, take up, and regenerate resources that are intrinsically part of life on earth. The way humanity organizes its activities in societies or as part of sociometabolic regimes (Krausmann et al., 2008) is recognized as essential to the scale and intensity of resource use (here understood as including land, water, materials, energy, and more). Societal constructs such as political systems, economic systems, and the built environment all pose forms of mediation for this organization, shaping activity as well as being shaped by the activities of various societies.

Illustrated in figure 4, the above perspective can be seen in terms of a concentric model of sustainability—with planetary boundaries within which society must operate, placing the economic system as a subset of society. This of course offers only a simplistic graphical representation of what is acknowledged as a far more complex world. The "wickedness" of issues relating to socio-ecological relations points to the need to problematize different models of sustainability, but the use of graphical representations also enables a discussion of the differences in approaches.

Criticism of the commonly used Venn diagram showing the "three aspects of sustainability" (environmental, economic, and social) as equal intersecting circles, for example, underlines the importance such diagrams hold in shaping discourse and cognition of complex problems. Equalizing the three aspects is seen as deflating the role an economic dimension holds in mainstream development (Lozano, 2008). Yet this definition of an "integrated" sustainability perspective nonetheless still positions the economic aspect as an
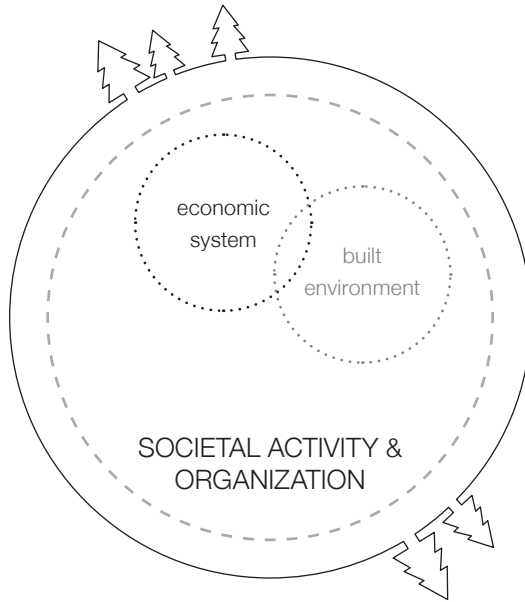
Figure 4. A concentric understanding of planetary boundaries within which society must manage

Figure 5. Framing a safe and just operating space (based on Raworth, 2012)

entity that could (and should) be equal to environmental or social considerations, both of which could be understood as constructs in themselves. Another problem with the Venn representation of sustainability is that despite all the talk of integrative approaches, it can be understood as legitimizing working with one aspect at a time without further consideration of hierarchy or power structures.

In trying to link ecological boundaries to social development issues, a complementing framing of the challenges for sustainability found useful to the work presented here is Raworth's (2012) "doughnut" of planetary and social boundaries (as simplified in figure 5, lending itself to another form of concentric perspective). Based in Rockström et al.'s planetary boundaries, along with Raworth's reading of the prioritized social issues defined for Rio+20, this doughnut positions a safe and just operating space for humanity between social and planetary boundaries. While it could be discussed to what extent this model reproduces prevalent social development discourses on what exactly constitutes a "social foundation," it nonetheless poses a valuable analogy for the approach presented in this thesis. It provides not least a critical starting point for addressing (economic) practices that do not necessarily consider an environmental or social dimension, and stresses the inclusion of a social justice perspective.

2.1.2. DIMENSIONS OF SOCIAL CHANGE

In addition to what has been explored above in linking social and material aspects, the concept of sustainable development stresses the centrality of socio-economic implications. Although environmental considerations are increasingly addressed to varying extents in different sectors, a social dimension of sustainability has often been overlooked (Vallance, Perkins & Dixon, 2011), including in the building sector (Jensen et al., 2012). One way of approaching a definition of the social dimensions of sustainability is to identify two main aspects: a welfare perspective, emphasizing issues of social care and well-being of populations, and a long-term perspective on the problem-solving capacity of a society (Wistrand et al., 2011, Olsson, 2012). Concepts such as equity, participation, and social cohesion, along with awareness of sustainability issues as a whole, are often highlighted (Murphy, 2012). Social sustainability could yet also be seen as the very process of development within communities that ultimately supports a so-called positive social condition (McKenzie, 2004).

Transitions to a low-impact society will demand an examination of the current

organization of societal systems and distribution of resources, making it a matter of politics. A critical question, however, appears to be whether environmental and social impacts are found to be symptomatic of or intrinsic to current societal systems and notions of modernity. The transitions of interest here relate to changes of an abstract concept (the home) just as much as socio-technical systems and the built environment, where understanding the co-evolution of low-impact ways of living includes exploring trajectories that cut across sectorial and temporal boundaries (Shove & Walker, 2010).

While incremental efforts under the guise of being "green" might placate environmental concerns among high-consuming groups, acknowledging the role of Western societies in environmental degradation and global inequalities is significantly more confrontational. It is understood that those living with a surplus of goods and financial resources, particularly affluent households in Western/Northern societies, need to "liberate conceptual space for countries [in the 'developing South'] to find their own trajectories to what they define as the good life" (Kallis, Demaria & D'Alisa, 2014:5). This perspective addresses political and economic structures of power, but also challenges conventions and practices enforced by years of growth and techno-centered sustainable development ideologies. This further calls for changes in societal systems in current high-consumption societies. This includes exploring ways of life that are less dependent on the large-scale industrial complexes that have contributed to the accumulation of wealth in the first place.

Another concept adopted by an emerging "degrowth" movement is that of conviviality (D'alisa, Demaria & Kallis, 2014). Going beyond a common understanding of the term as simply enjoyable or livable, the use in a degrowth context more specifically refers to Ivan Illich's definition of convivial tools in everyday life, which are "...used by everyone in an integrated and shared manner, without reliance on a body of specialists who control said instruments" (Deriu, 2014:79). This poses a contrast to industrially based ideas of productivity, instead lending itself to imageries surrounding community, democracy and a more downscaled or simpler life. The notion of conviviality moreover stresses collaborative aspects, and the potential of shaping one's physical living environment as well as social context more directly.

It is relevant to explore the potential implications different types of transitions beyond a growth paradigm will have for housing development, both in terms of the building stock as such (Xue, 2015) and what this means for everyday life, forms of production and

consumption, and social and material relations in the home (Alexander, 2013; Lietaert, 2010). The right to adequate and affordable housing is recognized as an imperative task in developing sustainable residential environments and strengthening "social capital" (Maliene, Howe & Malys, 2008), yet the current market-oriented housing provision in Sweden tends to focus on wealthier socio-economic segments (Hedin et al., 2011).

The importance of social interaction, resident engagement, and community support in the immediate residential environment is often asserted, along with aspects of stability and safety (Dempsey et al., 2009; Vallance, Perkins & Dixon, 2011). Mainstream developments tend to envision urban social sustainability as the attractive, "livable" city that mixes housing of various types, sizes, and forms of tenure, as well as mixing residential and commercial functions (Kvillebäckskonsortiet, 2011). The merits of such deliberate planning and design for social mixing has been contested, however (see Buys et al., 2007 or Lees, 2014). A socially sustainable development of the built environment remains a key challenge in moving towards a more just society with a radically lower absolute environmental impact.

2.2. GREENING THE HOUSING SECTOR

Environmental consideration has become part of the agenda in the Swedish building sector over the past decade (Gluch et al., 2013), driven in part by anticipated EU regulations regarding energy performance and in part by national goals for environmental preservation and reduced energy use in new buildings, as well as local policies intended to steer development. Despite these general efforts, ambitious project-based investments in low-energy or efficiency strategies within the sector, and a mainstreaming of sustainability and improvement of environmental performance in relative terms, there is nonetheless still a discrepancy compared to what would be needed to reach environmental and social goals for a low-impact built environment.

The "greening" of the housing sector in Sweden further highlights a framing of sustainable development within an ecological modernization paradigm (Lundqvist 2004), where improvements of society, often understood as further technological and economic development, are coupled with environmental consideration and preservation (or more efficient use) of resources (Jensen & Gram-Hanssen, 2008; Lidskog & Elander, 2012). Within this framework the concept of green consumption supposes market mechanisms in steering consumption towards less environmentally harmful products (or buildings

for that matter). By "internalizing externalities"—associating consumption with a price that accounts for the environmental harm caused—households are to make purchasing choices that reduce resource use (Spaargaren, 2000). In the current market system of housing, complexities of socio-technical transitions are thus simplified to an assessment of willingness to pay for "green" products and services.

The question, however, is whether low-energy and "green" housing actually equals less energy and resource intensive ways of dwelling. The role of people as residents and co-creators is a key factor of resource use in the built environment, where individual differences in behavior in relation to the home environment are found to be one main indicator of the variation in domestic energy use (Lindén, Carlsson-Kanyama, & Eriksson, 2006; Sunikka-Blank & Galvin, 2012; Hiller, 2015). Eco-efficient innovation in building performance and a belief in optimization is nevertheless anchored in the widespread belief in technical solutions. The sector showcases technical innovations within the framework of rather conventional buildings, ensuring a retained housing standard (seen in projects such as the One Tonne Life house, onetonnelife.se). An incremental implementation of low-carbon technologies is seen as minimizing the need to radically modify standard practices of production and design within the sector (Lees & Sexton, 2013). It further places mainstream metrics for sustainability within the context of upholding middle-class household norms (Bradley, 2009).

Critics of growth-based development narratives argue that efficiency and technology alone are not enough to solve present and upcoming challenges of ecological preservation (Huesemann & Huesemann, 2008; Turner, 2008). A belief in "techno-salvation" also poses a potential barrier to instigating behaviors that minimize further strain on resources (Gifford, 2011). Exploring strategies that go beyond reliance on technical solutions is increasingly viewed as essential, yet remains rare in a techno-focused industry and research perspective (Schweber & Leiringer, 2012) where sustainability measures often revolve around energy efficiency and clean-tech (Jensen et al., 2012). However, a narrative turn in energy research (Janda & Topouzi, 2015) calls for researchers engaged in normative work for a more sustainable built environment to tell stories that embrace complexity rather than reduce it to simplistic physical or technical solutions. This includes gaining an understanding of everyday practices and what people do in their homes, and social norms surrounding home, comfort, and living standards.

2.3. TOWARDS LOW-IMPACT LIVING

2.3.1. LEVELS OF CHANGE

It is commonly recognized that the transitions needed to meet the challenges of living within planetary and social boundaries call for changes in various areas and sectors of society. Still, a debate on responsibility and agency tends to skew the discourse to a dichotomy between large-scale societal changes and individual action, even within research (see for example the exchange between Shove, 2010; Whitmarsh, O'Neill & Lorenzoni, 2011; Shove, 2011). This supposed dichotomy posits "behavioral change" on one side, assuming an evolutionary economical, rational choice model (at least polarized as such by Shove and others), and "societal change" on the other, arguing for the inadequacy of individual actions.

The work pursued in this thesis tries to bridge such dichotomies and simplified models of micro/macro level approaches (Reid, Sutton & Hunter, 2010), or more generally a methodological individualism/holism (Agassi, 1960, Geels, 2010). Law (2004), for example, questions the reduction of "global reality" to macro-social structures. Murdoch (2005:27) in turn describes Latour's perspective on scale as that "...there is no macro- or micro-level of social reality; there are just sets of relations, some long, some short." In line with these ideas, problematizing the question of levels or scale, the assumption made here employs an understanding of social practices—outlining people, as carriers of practice, as "...neither autonomous nor the judgmental dopes who conform to norms" (Reckwitz, 2002:256), implying measures of agency along with adaptations to a shared social order.

Problematizing a neo-liberal framing of the rational consumer and push for individual change raises questions of individual or collective responsibility in challenging current ways of life, understood to be intertwined with prevalent cultural values and beliefs (Hobson, 2002). Reid, Sutton and Hunter (2010:1) further propose bridging the dichotomy of level of change by positioning the household as a meso level where "macro level change can be observed and micro level activity can be contextualized." The household can also be understood as a level on which cultural values are mediated and everyday decisions made that both shape and are shaped by material realities (Klocker, Gibson & Borger, 2012). Framing householders as stakeholders highlights the co-construction of "normal" practices connected to social or infrastructural networks and policy concerning various aspects of households in themselves (their configuration, levels of occupancy, etc.) and inter-household relations (Lane & Gorman-Murray, 2011; Head et al., 2013).

Another common dichotomy along the same lines is found between what is often portrayed as "weak" or "strong sustainability," where Hobson (2013) argues for finding and working with "conceptual and practice-based spaces" in which the two strands intersect, looking for opportunities to diversify perspectives and research practices regarding ways forward, relating again to a pragmatic research approach (Hobson, 2006). Understanding social practices as the nexus of this possibly encompasses both weak aspects of specific acts of sustainable consumption and strong yet situated societal shifts. By exploring how practices, as patterns of action, are constructed and transcend a single individual (Shove, Pantzar & Watson, 2012), the development and adoption of less impactful ways of living must be juxtaposed with a larger systemic change in which individual actions rely on social support (Seyfang, 2009), emphasizing the need to contextualize potential transitions.

Diversifying discourses of sustainable consumption or sustainable living includes questioning consumption practices based on a larger social justice framework and transition towards sustainable societies (Hobson 2002). While behavioral change research has been criticized for its tendency to simply bundle contextual factors (Shove, 2010), the role of structural or social context and spatial relations deserves further reflection. Especially in research on the built environment, a stronger spatial dimension of what Murdoch (2005:197) calls "ecological/environmental actions" and "mental ecologies" involves exploring the "… social and spatial arrangements that will be required if such ways of being [ecological] are to be established in practice."

2.3.2. APPROACHING LOW-IMPACT EVERYDAY PRACTICES

As emphasized previously, the impact of modern ways of living goes beyond the resource intensity of residential buildings themselves, corresponding to social norms concerning what constitutes a good life, including the home and the artifacts and activities involved in it. It is recognized that different groups might face different challenges for living more sustainably (Barr & Gilg, 2006). Yet rather than framing notions of "lifestyle" as merely an aggregate of individual consumer choices, everyday actions must be understood as simultaneously reproducing and being locked in by societal structures (Sanne, 2002). An increase in living space and in residents' spatial and material demands (Wilson & Boehland, 2005; Vale & Vale, 2010), including the use of home appliances (Marsh, Larsen, and Kragh, 2010), poses new challenges as ways of life and households change. Across Europe, shifting

demographics and an increasing number of small households strain existing and future housing resources (Clarke, 2004; Kabisch & Haase, 2011). A growing individualism also highlights the resource intensity of satisfying individualized needs, with implications for absolute demand both directly and indirectly (Liu et al., 2003).

Kennedy and Krogman (2008) propose an integration of structural and individual perspectives, where consumerism can be seen as a result of daily routines, and emphasize theories of social practice in understanding how changes towards more sustainable ways of living might come about. Seeing household consumption of resources as an outcome of everyday practices rather than an origin of them (Strengers, 2009) problematizes prevalent eco-modern notions of pricing and steering consumption (as discussed in the sections above), and instead suggests addressing what people do in their everyday lives and why. Lockton et al. (2013:1), for example, argue that people rarely set out to use energy, but that it "is a side effect of solving everyday problems." From this perspective, the potential for low-impact practices needs to be situated within the complexity of residents' everyday activities, the physical spaces they occupy and move between, their economic space for action, and the cognitive spaces and perceptions of a good home that are negotiated and reproduced (Berthoû, 2013; Maller, Horne & Dalton, 2012).

While recent developments in practice theory, for example by Shove, Pantzar and Watson (2012), are starting to approach the formulation of practice-based policy to drive change, the lack of more concrete proposals for direct action has nevertheless been a point of criticism with regards to the usefulness of practice theory among those engaged in creating new services and systems that enable or facilitate more sustainable ways of life (Strömberg, 2015). Practice theory is nonetheless here seen to provide a relevant framework for understanding how different social and material elements of human activity relate to one another and might change over time, but this thesis also proposes a normative agenda for exploring more radical low-impact practices. This is not necessarily focused on how new practices are "innovated" (as discussed in work trying to apply practice theory in formulating sustainability interventions), but instead uses practice theory to understand relations between individual residents' agency, social structures, norms and meanings, and the materialities of home environments.

The context explored here, relating to and taking place in the home (as further elaborated in Chapter 3), assumes practices that are culturally significant for what we view as "modern

(domestic) life." In going beyond the often-posited dichotomy between intention and action, where constructs such as attitudes are positioned against actual behavior, understanding how concepts—as preconditions for action—are created emphasizes both cognitive and practical operating space (Strömberg, 2015). Concepts are thus here used to signify a framing of what is conceived as possible, shaping the range of practices and the associated resources and knowledge required, along with the meanings of home themselves. Reflecting on the three elements of practice as briefly outlined in section 1.3. (meaning, competency, and artifacts), material and habitual facets, like symbolic images and meanings, are seen as important to consider in the resource intensity associated with contemporary practices. Exploring conceptualizations of home that pose alternatives to those reproduced in current mainstream development might thus challenge different aspects of what people do, why they do those things, with whom and in what types of environments they do them, and for example what levels of spatial or material standard they reequire. These are essential questions in creating environments that facilitate practices that could be part of a shift towards a low-impact society.

3. CONCEPTUALIZING HOME

This chapter builds upon Chapter 2 in providing a theoretical basis for the thesis, and for the empirical studies, in problematizing and illustrating conceptualizations of a sustainable home. While Chapter 2 suggested a framing of sustainability in relation to the built environment and raised aspects concerning ways of life and everyday practices that have environmental and social implications, this chapter delves deeper into perspectives on and notions of home as conceptualized in research and in previous and current development of housing. The chapter consists of three sections: first, a review of the meanings and significance attributed to home and the historical development of home concepts is given; a second section elaborates on the commodification and ideals surrounding the home in contemporary discourse; and finally, definitions of home-related practices are proposed as a basis for the exploration and discussion pursued in this thesis.

3.1. CONCEPTS OF HOME

3.1.1. MEANINGS AND SIGNIFICANCE

Concepts are here considered as part of cultural scripts, providing a framework for everyday life (Swidler, 1986). Concepts of home have been and continue to be influential in shaping human interaction, ranging from physical manifestations to social constructs and theoretical platforms. How we inhabit residential environments and the significance we give them is part of how we formulate an understanding of the world and our place in it.

Home has been a subject of inquiry in various fields during the past decades and has been explored from both an individual interpretive and societal constructivist perspective (Després, 1991; Birdwell-Pheasant & Lawrence-Zúniga, 1999; Moore, 2000; Manzo, 2003; Mallett, 2004). Personal connotations of home are used to describe or define various aspects such as "at-homeness" or "homeliness" at different times and scales. In this respect, *home* can be considered too broad, underlining the problem of using "vague, subjective, and emotive terms in ways that can mean whatever users want them to mean at any given moment" (Rapoport, 1995:25).

Difficulties in defining a concept of home have been raised as home reflects both a "reality and an ideal" (Mallet, 2004). However, this dynamic nature of the concept is here argued to be of an evolutionary value precisely because of this broad significance and use of the term, as it is understood to encompass a complexity of dimensions in the form of people-place relationships (Manzo, 2003) and cultural expressions.

MEANINGS OF HOME (Després, 1991)	DIMENSIONS OF HOME (van der Klis & Karsten, 2009)
Relationships with family & friends Refuge from the outside world Center of activities Acting upon & modifying one's dwelling Security & control Material structure Place to own Reflection of one's ideas & values Indicator of personal status Home as permeance & continuity	Social dimension Activity pattern dimension Material dimension

Table 1. Categories of meanings of home in previous research

Meanings of home often are linked to categorizations such as those provided by Després (1991) and van der Klis and Karsten (2009), as seen in table 1. These categories range between home as a place and concept that holds social value in relationships with family or friends and the material properties of home as a tangible structure, framing everyday life and the artifacts and symbols that are part of "doing" home.

The socio-political milieu of which home is part (Manzo, 2003) can be seen in parallel to more personal and emotive meanings of home, as they are understood and portrayed in subjective individual definitions. In line with structuration theory, the interest here is neither to study "the experience of the individual actor, nor the existence of any form of societal totality, but social practices ordered across space and time" (Giddens, 1984:2). Applicable in seeking to [re]conceptualize home in relation to notions of sustainability, questions arise that deal less with particular individual interpretations and more with the images and meanings of home as they are conceived and upheld in social practices.

Saunders and Williams explore home as the vital interface between society and the individual, "the crucible of the social system" (1988:85). Using similar terminology, and as discussed in section 2.3.1., Reid, Sutton and Hunter (2010) instead position the *household* as mediating between different levels. As a socio-spatial entity (Easthope, 2004), socio-psychological interpretation (Després, 1991), or contextually based social dimensions (van der Klis & Karsten, 2009; Tester & Wingfield, 2013), meanings of home are understood to link society, social relationships, and the household. These meanings also propose socio-

cultural constructs that inform and are informed by notions of identity and wellbeing, along with the material and structural properties of people's homes.

Examining different interpretations provides a reference for how conceptualizations of home are discussed and manifested, and subsequently to what extent they are also contested. By studying processes surrounding home as both a conceptual and material entity, the potential of integrating an environmental, low-impact agenda also suggests exploring new perspectives and negotiations of home as an expression of changing societal values and attitudes (Benjamin, 1995).

3.1.2. HISTORICAL DEVELOPMENT AND THE GOOD HOME

While meanings of home are often taken as inherent and stable, the development of concepts of home, as linked to socio-technical developments, can be seen as a much more dynamic process. Changing concepts of home have interacted and co-evolved with changing home practices, and meanings have transformed alongside the development of systems of provision and technological innovations (Røpke, 2009). While dominant, "settled" practices may at times be established in cultural understandings (traditions and common sense), "unsettled" cultures (as in new or shifting ideologies) see the spread of new modes of practice (Swidler, 1986). This section provides a brief historical outline, while a more thorough background can be found in a previous master's thesis (Hagbert, 2011).

The term home is estimated to have been around for a couple thousand years (Benjamin, 1995), but the way we have viewed and defined home over the centuries has varied. In his first-century-BCE *Ten Books on Architecture* (transl. 1999), Vitruvius suggested that the discovery of fire brought about the occurrence of organized social gatherings, and that the origins of architecture came out of the need to provide shelter for assembly and keeping the fire. The construction of shelters gradually evolved and the first dwellings were born around the protective comfort of a hearth, connected to rich and intricate social codifications. The idea of hearth as connected to family and household ties is evident in pre-industrial connotations of home, emphasizing aspects of survival and community.

Brink (1995) gives an account of the etymological origins of home, tracing the word back through early Germanic forms and connecting early meanings of home to collective ideas including world, village, farm, country, resting place, and camp. However, he also connects it to notions of family, household servants, love, and marriage. These derivatives,

along with current words related to home, deal with dwelling and affection, even suggesting the affection developed for one's dwelling. These two perspectives represented in a terminological background, the collective/general versus the personal/specific, offer two parallel dimensions for the development of concepts and meanings of home.

With the industrialization of Europe and the western world came major changes in society during the eighteenth, nineteenth, and twentieth centuries, including an unprecedented rate of urbanization. This shift from rural to urban home can also be explored as the domestication of the word altered from a more general meaning to referring to the family dwelling or house (Moore, 2000). With the rise of capitalism and the industrial age, concepts of dwelling and house also came to represent and subsume new politico-economic and techno-social ideas. An emerging urban bourgeois class fostered ideas of domesticity, in which concepts such as intimacy, privacy, seclusion, and homeliness made home a place where you could be personal and find relief in introspective exploration (Rybczynski, 1986). The more practical aspects of home that the pre-industrial rural context had stressed were replaced by constructs of comfort, leisure, and retreat. However, this did not change the realities of home as simultaneously a place of work, especially for the urban working class, making the domestication of home a matter of class and standing.

As a new industrial society started to take shape and a greater part of western populations was introduced to the amenities of the "comfortable home" during the nineteenth century, technical inventions and the mechanization of dwelling functions were integrated into notions of home-making (Rybczynski, 1986). Even though the concept of home as we define it and signify it today can be said to have developed along with the birth of other revolutionizing ideas and concepts during the industrial revolution, the emphasis of home as a machine and the rational organization of dwellings was accelerated with modernization in the late nineteenth and early twentieth centuries. A Tayloristic "scientific management" in industry was extended to all spheres of society, including the home (Brunnström, 1990).

As new technology made household tasks simpler and as popular opinion swayed, the focus turned to managing domestic tasks as swiftly and comfortably as possible. Laborsaving inventions were introduced and became the norm by the mid-1900s. The rational modern movement also introduced new architectural ideas: the personal and private was replaced by spatial fluency and new materials. The new demands of efficiency, control, and comfort were largely considered a female matter, and the time spent at home had to be divided between

household work, "wifely duties," and an increasing rate of gainfully employed women (for a more detailed account of the time geography of the domestic everyday in the early and mid-1900s, see Åkerman et al., 1983). Even as women's rights were established, the domestic placement and the modern female relationship to home was largely restrictive, reproducing the social norms of a good home-maker. As new technologies were conceived to reduce the hardships of domestic life, they also identified jobs that could now be performed by a woman, further establishing a female relationship with modern domestic "convenience."

While the progression of the efficient household may have emerged from changed views on the comforts of home enabled by development of new technology and practices, the large-scale reforms that swept over much of the western world in the early twentieth century were very much political. At the beginning of the twentieth century, the dwelling was considered a private affair, not a matter of local or national political responsibility (Thörn, 1994), and the housing market was dominated by private initiatives that framed the home as a commodity (Rudberg, 1994). A lack of adequate housing for the increasing number of urban working class residents was met by a wider Social Democratic debate on the right to a decent life, based on ideas that ensuring good housing standards was essential not only for the poor but for society as a whole (Heideken, 1994). Standardization and overall improvement in the housing stock was one of the key components of the political social agenda of the 1920s and 30s, whether in Roosevelt's "New Deal" or Per Albin Hansson's *Folkhemmet* ("People's Home"). The latter likened society to a family, where personal freedom for a greater number of people could only be achieved through collaboration (Rudberg, 1994).

This social interest was displayed in an array of government-led housing investments, research, and reports, sparking further political incitement and strongly influencing the development of housing in Sweden, with large-scale implementations particularly after World War Two. Domestic research, emphasizing the knowledge of everyday life in the home, including the role and perspectives of women as working in and with the home, developed during the twentieth century (see Åkerman et al., 1983 and Åkerman et al., 1984), and has continuously been raised by organizations like the Kvinnors Byggforum (Women's Building Forum) (Larson, 2004).

As the standards improved under different national public projects that would culminate in the Swedish "Million Housing Units Program" of the 1960s and 70s, the access to

"good" housing was dramatically changed. This was made possible in part by new industrial construction methods, with prefabrication and standardization of building elements, but also the establishment of large-scale industry in a corporatist "Nordic model" in which the financial strength lay with construction companies and housing organizations rather than with residents. Since the neo-liberal turn in the 1990s (Turner & Whitehead, 2002), the market has in many ways steered housing development in Sweden, and the ideals of the publicly directed and standardized *Folkhemmet* have in different ways been shunned as hindering personal freedom and being too prescriptive in relation to new types of lifestyles, household configurations, or social patterns.

3.2. HOME AS A RESOURCE INTENSIVE IDEAL

3.2.1. MATERIALITIES AND COMMODIFICATION OF HOME

Various ideals surround concepts of home, relating to for instance shifting notions of comfort, expressions of identity, or financial attribution. Following a relational materialism (Metzger's, 2013), the different elements of housing development, notions of home, and aspects of resource use can be seen as interlinked and understood as heterogeneous (encompassing financial mortgage structures, politico-economic factors, technological development, subjective emotive, or normative discursive perspectives).

Home has come to symbolize both individual and cultural identity, where physical needs are weighed against social and emotional aspirations embedded in the concept (Gauvain & Altman, 1982; Lawrence, 1987; Hauge & Kolstad, 2007). Home as a social arena presupposes as well as enforces the formulation and perception of cultural ideals and discourses on home. The particular representation of status through individual possessions is of a communicative nature, where a comparative element of identity in this respect assumes a distribution in available resources to distinguish the self, or the group, from the larger societal context. Although social standing is judged in multiple ways depending on context, physical and locational realities suggesting socio-economic or cultural distinction from others are acknowledged in the perception and reflection of identity, with resource implications also on a residential planning scale (as explored by Stedman, 2002; Gram-Hanssen & Bech-Danielsen, 2004; Hauge & Kolstad 2007).

The framing of housing as a commodity is prevalent within the current housing market, made all the more clear through the interlinkage of mortgaging structures and financial

systems on regional as well as global levels. These structures show the unsustainability (in the literal sense suggesting an instability over a long period of time) of the way we build, manage and finance our homes in the developed world, spanning ecological as well as economic systems. The cyclical nature of housing bubbles (Agnello & Schuknecht, 2005) emphasizes the limitations of a market interpretation of housing as another facet of the built environment in terms of investment, revenue and demand/supply.

In an increasingly globalized understanding, and as the image of place gains importance (Easthope, 2004), an awareness of the imagery relating to home is not only noticed in household consumption and home-related commodities (Gram-Hanssen & Bech-Danielsen, 2004), but also in the very construction and sense of home as a commodity in itself—an emotional, social or restorative "product." With globalized construction practices and financial systems and transnational real estate investments, and with the merging and reproduction of cultural expressions, the representations and discourses and ultimately also the physical manifestations of home are subject to acculturation. In the context of emerging economies, Rapoport (2008:28) observes, "... as the resources available increase even housing becomes less culture specific. /.../ with prosperity images of modernity and of difference (which currently are those of US suburbia) begin to dominate...."

The way home is commonly represented by media and advertising in a western politico-economic context emphasizes consumption and private ownership. However, the relation between home ownership and place attachment, or feelings of "at-homeness," has been found to be weak (Windsong, 2010). While the material dimensions of home are emphasized by van der Klis & Karsten (2009), meanings of home should also be understood as contextual. Tester & Wingfield (2013) propose that although home might be constructed in similar ways among residents, tenants in public housing emphasize the social dimensions of home, while other dimensions (such as material aspects) might be subordinate.

3.2.2. PREFERENCES, NEEDS AND NORMS

The mapping of housing preferences is a prime interest in the housing sector, with developers and housing companies conducting surveys, market assessments, or trend analyses often through third party consultants (such as Tyréns, 2012). The representativeness of preferences is nonetheless complex, partly in the distinction between stated and actually revealed preferences and housing choices (Coolen & Hoekstra, 2001), but also with regards

to the target groups and types of residents encompassed by market assessments[1]. While willingness to pay is used to assess preferences (Tyréns, 2012), this rather blunt measurement does not explicitly relate to needs and motivations beyond financial prioritization in the current system, which is determined by what the market offers.

The importance of allowing residents to "make their mark" on their homes and pick individualized options is emphasized (Tyréns, 2012), but current trends are also framed within social conventions and prevalent norms. The kitchen, for example, is often perceived as encompassing a social dimension of home, where the reported demand for a personalized kitchen (that is still large enough for socializing) is pointed out as something people are willing to pay for (Tyréns, 2012). The open floor plan is another ideal found in contemporary housing development (Willén, 2012), yet the limitations in use in relation to various household configurations calls into question for whom these dwellings (specifically apartments) are built, and the notion of majority or minority preferences (Manum, 2006).

Another question is also how useful preferences are in saying anything about actual quality in the home environment, which in itself can be argued to be a relative term. Moser (2009) points out that overall residential satisfaction is to be understood as a complex overlay of factors, where a strong social connection to a neighborhood might overshadow subpar individual physical conditions. A modified hierarchy of housing needs (Lawrence, 1987) brings in aspects such as comfort, socialization, self-expression and aesthetics along with notions of shelter and security—factors connected to the wellbeing of home. These factors are conceived to fluctuate over time, where needs established (and fulfilled) at one point might become unsatisfactory later. As suggested by Max-Neef (1992) in his human development model, satisfiers should be differentiated from needs—for instance, shelter is not a need per say, but rather a satisfier of the need for subsistence. In this perspective, home (as both an abstract and concrete concept) could be understood as a satisfier that meets several of the identified human development needs, not necessarily only in the physical manifestation of housing as shelter.

Perceptions of quality of life are also relative to people's notion of standing (Moser, 2009), relating to the larger societal systems to which they belong, along with individually conceptualized aspirations, hopes, and considerations. As explored by Gauvain &

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1   Manum (2006) for example discusses the apartment stock of Oslo, and the mismatch between supply and the actual demand of the large groups of residents who are not financially visible in the current housing market

Altman (1982), the dialectic of guarding one's individuality against external pressure while simultaneously seeking belonging provides seemingly contradictory perspectives on home preferences. The importance of home to individual and socio-cultural identity is multifaceted, and as socio-emotive factors inform spatial activities, these activities in turn inform the way home environments are shaped.

Thus notions of comfort, convenience, and expected material standards should be seen in a normative context (Wilhite et al., 1996; Shove, 2003; Shove et al., 2008), where social structures, individual differences, and "objective" measures influence perceptions of overall comfort. Normative understandings of "good" standards are upheld in what is built, but also driven and contested by market developments. At the same time, established standards are increasingly challenged in contemporary discourse, and particularly in the Swedish context, where the need for affordable housing is framed as a call for further deregulation.

3.3. HOME-RELATED PRACTICES

As emphasized in previous chapters, the research presented here does not look at housing innovations as such, but rather operates within an understanding of practice theory as a framework for studying the ideals and physical manifestations of notions of home, which co-develop over time as new home practices emerge (Shove, Pantzar & Watson, 2012) and might change in the future. Rather than dismissing the above outlined categories of meaning regarding how people view home (and themselves in relation to their homes), exploring how home is constructed offers a starting point for assuming an evolutionary perspective. This includes seeing how alternative futures (here understood as a quite vaguely defined low-impact society) might offer, or demand, alternative conceptualizations of what sustainable homes could entail in terms of materialities, social relations, and everyday practices implied (relating to how concepts are operationalized—that is, how they are put into practice). Moreover, it appears relevant to emphasize that home, as understood in this thesis, is not limited to the physical boundaries of the dwelling.

Concepts of home are here understood to be constituted by the daily practices that enact them (that "make" home), but are also reproduced as part of the meanings of these practices (illustrated in figure 6). Thus, concepts are seen as being both part of the elements of social practices—i.e. as "subordinate" to a practice theoretical framing—and as transcending particular practices, as outlined by Shove, Pantzar and Watson (2012).
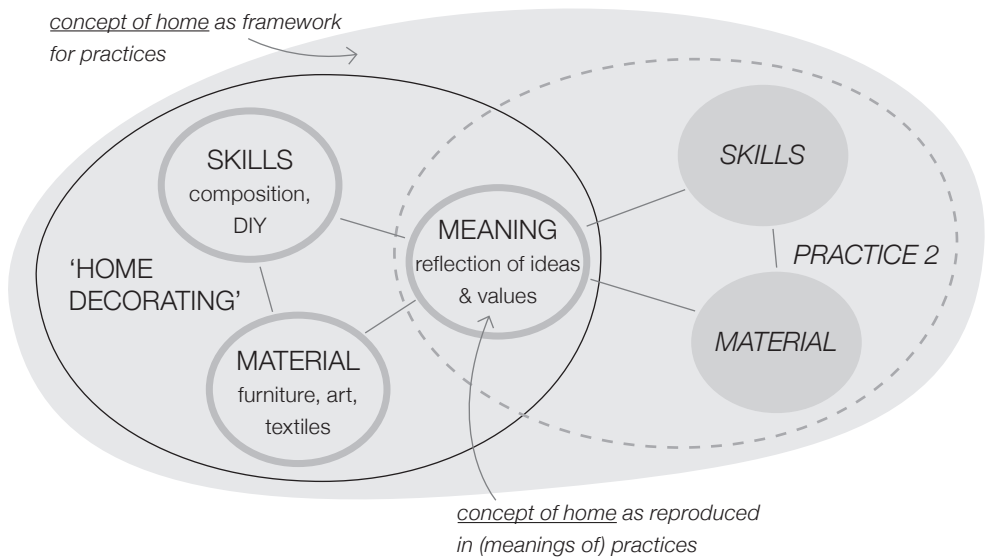
Figure 6. Concepts of home in relation to home-related practices

The practices expressed as "home-related" here could also be understood according to two different aspects of "doing home" (as "practicing" home in a meta sense). Firstly, this includes practices that are seen as (commonly but not exclusively) taking place, and thus being integral (translated into specific functions or spaces) in the home environment, such as cooking, cleaning, or watching television. Secondly, the practices can themselves be considered essential in creating a sense of at-homeness, as part of home-making, reproducing meanings of home in diverse ways, such as home decorating, relaxing (incidentally often related to, among other things, watching television as "family time" together), or hosting (socializing at different scales).

The point made here is that these two understandings of home-related practices of course overlap and are linked through different sharing of elements of practice, such as meanings or artifacts/spatial functions in the home. Practices of cooking can lend themselves to contributing to feelings of at-homeness, just as hosting a dinner party could be considered a home-related practice due to it simply taking place in the physical premise of one's home. Or, as depicted in figure 6, one practice (exemplified by home decorating) might share the meaning (in the example home decorating is seen as a part of reflecting identity, one's ideas and values) with another practice (such as installing solar panels or other "green" solutions to

signify one's pro-environmental orientation—which itself might also hold other meanings shared with certain other practices in one's life).

While resource use is conceived here as a consequence rather than the driving force of home-related practices, the use of energy, spatial, and material resources of course enables different practices. Various systems of provision uphold practices, just as social networks and relations depend upon spatial and material prerequisites (Head et al., 2013). "Doing home" is hence linked to both material and social aspects, and home-related practices can be understood as a clustering of various practices and their respective elements of stuff, skills, and meanings, which shape what the home is and could be.

The low-impact home practices explored empirically in this thesis relate primarily to aspects of sharing resources and spaces, living smaller (which in itself is perhaps not a practice as such, but demands a change in several practices), and reducing home-related consumption or potentially lowering the material standards we have grown accustomed to (seen as relying on and impacting several practices surrounding reuse, repairing, personal heating, etc.). These are considered particularly relevant in light of the framework provided in Chapter 2, and the demands on absolute reductions in resource and energy use, but also in terms of social re-organization. This also includes the integration and reassessment of other practices related to production, consumption, and social relations in and of the home, which link to for example a larger scope of sharing or voluntary simplicity.

4.   METHODOLOGY

Outlining the research approach undertaken, this chapter presents the methodological framework and research design upon which the thesis is based. The work can be understood as engaging mainly in qualitative research and the approach has been explorative. It has consisted of a series of studies in which different methods have been tried as a means of furthering the research, yet with a cross-study focus on in-depth interviews. The first section describes an approach towards people-centered research in the built environment, including key epistemological questions of validity and generalizability. The overall research design is then presented, followed by sections giving more detailed accounts of the background, material and procedures of three empirical studies, including reflections upon the methods used.

4.1. RESEARCH APPROACH

4.1.1. ONTOLOGICAL AND EPISTEMOLOGICAL STARTING POINTS

The point of departure for the research presented in this thesis is a general social-constructionist ontology, assuming an understanding of society and perceptions of "reality" as socially constructed—that is, continuously shaped by and reproduced in the interactions that take place in people's everyday lives (Berger & Luckmann, 1966). However, in the merging of perspectives proposed throughout the thesis, a more moderate form of constructionism, as proposed by Järvensivu and Törnroos (2010), is found to be useful in bridging and thereby avoiding more extreme realist or relativist positions respectively. Taking a middle ground, moderate constructionism "rejects the positivist argument of a universal truth but accepts the possibility of specific local, personal and community forms of knowledge" (ibid.:101).

Socially constructed realities and ways of knowing are further understood as being shaped by different aspects of social activity, taking into account issues of injustice, power, politics, and discrimination related to ethnicity, gender, socio-economic status, sexuality, ability, and so on (Groat & Wang, 2002). The PhD work has thus from an early stage been based on a critical questioning of how we construct relations and structures, both cognitively and physically.

This ontological basis and understanding of "truth" or "reality" as commonly constructed has influenced the epistemology (as a way of approaching knowledge about and in the world), and the choice of primarily qualitative research methods to explore the aim and

research questions posed. A constructionist view emphasizes the relevance of gaining empirical insight into how people make sense of their own reality (Järvensivu & Törnroos, 2010). This is further based in the sociological principle known as the Thomas Theorem, which states that if people "...define situations as real, they are real in their consequences" (Thomas & Thomas, 1928:572). Framing people as active creators and enactors of reality through their practices furthermore suggests that people's narratives regarding practices and perceptions of a given topic (here revolving around concepts of home and how these are reproduced in contemporary development as well as everyday home practices) is a relevant starting point for exploring how this sense-making is formulated. Drawing inspiration from Gibson-Graham (2008; 2014), and positioning myself in relation to this constructionist and critical viewpoint, a primary claim of this thesis is the need to broaden and diversify discourses on sustainable homes in order to capture different perceived realities. Rather than looking for definite solutions, the research seeks to diversify perspectives in order to challenge dominant discourse and possibly change conceptualizations of home and future low-impact ways of life.

Acknowledging this in essence normative dimension calls for a greater sensitivity of my role as a researcher in relationships of power, and demands a critical reflexivity in addressing ideological barriers and perceptions and in proposing critical interventions for change (Groat & Wang, 2002). Thus the privileged position from which this PhD was undertaken should also be stressed. Seeking awareness of the power structures this thesis reproduces or neglects provides a reflexive basis for how the research and discussions presented are shaped and potentially biased. Being a doctoral student at an established academic institution, of upper middle class background, white and able-bodied, but also being a young female, offers multiple intersecting perspectives.

"Doing research" as a means of change is often inherent in design research, particularly drawing upon utopia-driven projective or prescriptive approaches (Janssens, 2012), and underlines the transformative nature of research engaged in contributing to a more sustainable society (Strömberg, 2015). This PhD work can be conceived as belonging to a performative orientation as outlined by Gibson-Graham (2008). This view on research situates the researcher in "making things otherwise" (Hobson, 2006:284). Acknowledging that social scientific research (re)makes the social world, the methodology used is recognized as shaping and enacting certain perceived realities (Law & Urry, 2004).

Seeking rich insights, particularly through qualitative methods, is here considered an appropriate approach to answer questions of what meanings are shaped around home practices and concepts. As described further in section 4.2, the thesis is based on three separate studies that have looked at perspectives among both market actors (developers and architects) and residents, where semi-structured interviews provide a methodological common thread for gathering insights in similar ways across the studies. However, this focus on interviews as a way of more openly exploring narratives given among different actors has also been supported by other methods (including a questionnaire and a focus group, along with document studies and home visits) to cover a broader basis of inquiry depending on the specific context of the study.

By employing a semi-structured approach, the interviewing situation is more attuned to variations occurring due to the length and focus of the interviewee's responses, letting narratives unfold as they come up (Kvale & Brinkmann, 2008). Yet by using a general interview guide, the interviews do not venture into a more unstructured approach, allowing me to still cover main pre-defined themes. However, this approach also stresses my role as interviewer in co-creating narratives.

Depending on the context, whether interviewing a resident or a market actor who enters into the interview situation in a professional role, the interview as a conversation (McCormack, 2004) will inevitably be colored by different expectations. My position as a young female researcher is also understood as potentially having influenced what is and is not shared by interviewees, where residents might have felt able to confide in me in a different way than if the interview had been carried out by a representative from a housing company or another public or private entity. The willingness to participate in an interview study to begin with will most likely also have been affected by this established researcher-participant relationship rather than that of company-client, for example. The role as an "ally" in seeking sustainable alternatives might have meant that some market actors as well as residents provided more contextually desirable answers than if I had presented the topic of the studies in a different manner. Interviewees' narratives are thus filtered through their own interpretations as well as mine, where the interview situation is understood to influence the narratives given in terms of the wording used and the meanings conveyed in particular contexts (Schwartz-Shea & Yanow, 2013). This has demanded consideration of potential biases in the stage of analysis, where full transcriptions of the interviews have provided a

support in comparing narratives and highlighting certain dominant terminology.

The framework of a just and safe operating space within planetary boundaries (as described in Chapter 2) means that examining various perspectives on sustainability and home among different actors is related to a series of assumptions. First and foremost, the political concept of sustainable development in itself is recognized as being in essence normative. It provides a general goal of what we need to achieve if we are to stay within internationally and nationally set targets, although the targets as well as the routes there are themselves contested. As such, the thesis is necessarily positioned within this normative and contested context. It compares both outspoken ambitions and more unspoken implications of different conceptualizations of a sustainable housing development to the efforts considered necessary to meet these normative goals, not only in relative terms (as claimed in the current greening of the housing sector) but also in absolute terms.

Occupied with questions of how conceptualizations of the sustainable home move between and around discursive and material form, the thesis encompasses a complexity of dimensions in the form of people-place relationships and cultural expressions. As the thesis deals with people and their environment it is based on an interest in understanding how relations (social as well as socio-material) shape and are shaped by each other. While the notion of "people-centered" research might be redundant as a term in other disciplinary fields, within design research (and particularly building research, one could argue) the need to emphasize an approach that starts in an understanding of what people do and why—rather than a purely technology-driven development—is crucial. The point of departure is thus engaging with people rather than buildings, yet acknowledging both the social and material implications of perceptions and practices of home. The research, while primarily based in empirical material from interviews, capturing people's own accounts of their perceptions and notions of sustainability in and of the home, therefore also incorporates a spatial and material understanding (supported by studies of floor plans, planning documents, and observations during home visits), in line with theories of social practice as bridging aspects of materiality and meaning (Shove, Pantzar & Watson, 2012).

4.1.2. RESEARCH PROCESS

With an explorative approach, the research has sought to gradually gain a deeper understanding of the study of how a sustainable home might be conceptualized. The

research process has been abductive (Alvesson & Sköldberg, 2009), following a moderate constructionist approach to knowledge production as the "middle ground between induction and deduction" (Järvensivu & Törnroos, 2010:102). Abduction is here understood as a process of wondering preceding empirical observations, where critical thinking is prevalent throughout. It should also be stressed, however, that the degree to which the research has followed an abductive logic has varied at different stages of the work, as is often the case, although the process as a whole might be considered abductive (ibid.). Along with empirical insights, theoretical developments have preceded as well as been the outcome of the studies—for example recognizing previous theory that supposes categories of meanings of home, yet also taking into consideration new perspectives on how home is conceptualized in relation to sustainability that emerged in the empirical studies.

Insights from one study have informed the development of the next, and so on, supported by theoretical inputs. My licentiate thesis, as a midway point, positioned the research as mapping discourses, in a rather two-dimensional understanding of the possibility and desirability of mapping systems. The PhD thesis then evolved into approaching complexity more in line with Law's (2004) call for detail and specificity rather than seeking generality. This has also shifted the overall framework, although the methods used have been similar in each of the studies and have developed accordingly during the course of the PhD. The first study, for example, used a terminology and framework that was closer to prevalent discourse in mainstream building research and market understandings of housing. This was then gradually complemented (and partly contested) as new empirical insights as well as theoretical strands have added to my understanding of the topic, creating a tapestry that is my interpretation or synthesis of concepts and terms as well as practical examples.

This process of abduction could moreover be seen to emphasize aspects of research as linked to perception, as proposed in a Piercian pragmatist sense (Paavola, 2005), where my own preconceptions and experiences in relation to the research field and topic should be acknowledged. Being educated as an architect, and having worked on one hand in municipal planning and on the other in a hands-on design/build housing project has provided me with a certain specific pre-knowledge. Combined with a theoretically oriented master's thesis exploring the definition and significance of home (Hagbert, 2011), this has influenced my entry point to the research, and contributed, for example, to an early focus on residential perspectives as complementing both my own experiences and previous research.

4.1.3. VALIDITY AND GENERALIZABILITY

As a central concept in how research is constructed and enacted, the idea of validity is seen here in the context of "construct validity," as an understanding of the social construction of knowledge, and the subsequent validation of knowledge outcomes within certain research communities (Kvale, 1995). A main question for qualitative research is moreover how to assess its quality (Collingridge & Gantt, 2008; Tracy, 2010). Tracy (2010:839), for example, proposes that "high quality qualitative methodological research is marked by (a) worthy topic, (b) rich rigor, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence." These eight criteria, she argues, can be met in different ways depending on the particular aims of the study undertaken, as well as the researcher's preference.

The research approach presented here underlines qualities of excellent research with regards primarily to sincerity, pursuing self-reflection about my subjective biases and inclinations (as discussed above), and the provision of a significant contribution for change. The latter relates both to what Tracy calls a worthy topic in that it is highly relevant and timely to discuss how we can transition towards a more sustainable way of life, and in the conceptual contribution presented in the discussion in Chapter 6, provides a potential way of approaching sustainable building research differently. Furthermore, a level of credibility has been sought, for example, in recounting a richness in empirical material (in-depth interview accounts illustrating situated meanings among different actors and contextual understandings) and through collaborating with other researchers from different disciplines during different stages of the research. Making use of complementary methods (between and within studies) and multiple researcher viewpoints has allowed "different facets of problems to be explored" (Tracy, 2010:843). This furthermore responds to the aim and value of the approach and methodology in broadening concepts through rich insights.

The thesis explores and shows, starting with parts of the picture (understood as multiple imaginaries and partial representations) in trying to understand how different perspectives overlap or contrast. Exploring narratives given by people as participants in the studies presented here does not as such offer generalizable "truths," but nonetheless seeks deeper insights that have value in the truths or perceptions they represent by diversifying our understanding of the lived world and the practices of and in it. In this sense, following an analytical generalization (Kvale, 1996; Collingridge & Gantt, 2008; Yin, 2008), the thesis

might not offer statistical generalizations, but nevertheless generates deepened insights that are relevant in relation to a broader societal perspective, as well as with respect to other research on sustainability in housing.

4.2. RESEARCH DESIGN

The empirical material included in this thesis is derived from three studies using relatively similar forms of data collection, complemented by continuous theoretical work and development. Figure 7 shows the focus of and methods used in each of the studies and the corresponding papers. The studies explore how concepts of a sustainable home are expressed among actors in three different settings, serving as examples of diverse ways of framing sustainability in contemporary development and discourse. They give in-depth snapshots rather than try to generalize from a large number of cases (Ragin & Becker, 1992).

Study 1 (corresponding to Papers A and B) looks at how sustainability and concepts of home are framed in an example of contemporary housing development and explores the discourse among developers and architects involved in a new "green" residential development in Gothenburg, on the west coast of Sweden. As the work has developed during the course

THEORETICAL FRAMEWORK *Literature studies, analysis & synthesis*	STUDY 1: "GREEN" MARKET ACTORS *Interviews* with representatives from 7 housing developers (8 interviewees), *focus group* with architects (8 participants) & *document analysis* Conducted during spring 2012 + winter 2012/13	PAPER A
		PAPER B
	STUDY 2: "ORDINARY" RESIDENTS *Questionnaire* (n=156) & *interviews* with 22 households (24 interviewees) in 'average' tenant-owned housing Conducted during winter 2013/14 + spring 2014	PAPER C
	STUDY 3: "HOME FRONT TRANSITIONERS" *Home visits* & *interviews* with 7 households (9 interviewees) that are trying to live in low-impact ways Conducted during spring 2015	PAPER D

Figure 7. Overview of the empirical studies and corresponding publications

of my PhD work, the appended scientific papers can also be read as part of a story in themselves—an iterative progression. In contrast to the more descriptive starting point of Study 1, the two later studies emphasize a more prescriptive objective of exploring low-impact home practices. Study 2 (described in Paper C) addresses residents' perceptions, focusing on "ordinary" residents that live in a tenant-owned multi-family housing area in Gothenburg, providing a perspective on willingness to live in less resource-intensive ways among those that might not be intentionally drawn to green housing. Finally, Study 3 (Paper D) places an interest in people that have chosen to live in ways that challenge prevalent urban lifestyle norms, and are engaging in various low-impact practices within the context of the existing stock in Alingsås, a town on the periphery of the Gothenburg metropolitan region.

An interest was placed in gathering narratives, and in total thirty-six semi-structured interviews were conducted: seven with representatives from development companies in Study 1; twenty-two with residents in Study 2; and another seven with residents in Study 3. The interviews were further supported by other methods of approaching self-reported attitudes and opinions, including a focus group workshop with eight participating architects in Study 1 and a questionnaire with 156 respondents from the same housing association in Study 2. Further contextual data was gained through document studies (including floor plans and planning documents) in Study 1, and visits to the residential environments of residents in Study 2, and more extensive home visits in Study 3.

The studies were to different extents done in collaboration with several other researchers, primarily during study design and data collection, as elaborated in the more detailed descriptions in the following sections. The main analytical work and main authorship of the four papers that form the basis for this thesis was nonetheless carried out by me.

4.3. METHODOLOGY IN STUDY 1

4.3.1. BACKGROUND AND RESEARCH QUESTIONS

The first study was conducted in the context of the green urban redevelopment of a former industrial site in the district of Kvillebäcken in central Gothenburg. The Kvillebäcken consortium (consisting of the seven developers building on allotted plots in the area, and the municipal development company Älvstranden Utveckling AB) established a mutual vision for the redevelopment in the form of the "Kvillebäcken Treaty." This treaty stipulated that

the developers agree to transform the area into a "socially, economically and ecologically sustainable urban district," and was further concretized in a program called Sustainable Development in Kvillebäcken (Kvillebäckskonsortiet, 2011).

After the eviction of former businesses and industries within the area, and extensive demolition and sanitation of the brownfield site, groundwork for the new development started in 2010[1]. Upon completion the area will comprise two thousand apartments and has been marketed towards urbanites in search of a more environmentally friendly lifestyle in a dense new mixed-use urban neighborhood, making it a significant example of contemporary framing of sustainable urban development. In light of this background, Kvillebäcken is seen as a relevant context for exploring perspectives conveyed by market actors working with green development within the mainstream housing sector.

The study focuses on key practitioners identified as contributing to the discourse on sustainable housing development through formulations of visions and plans as well as shaping the consequent built reality: professionals from the companies developing housing in Kvillebäcken and the architects who took part in the design process. Apart from the empirical data presented below, the study included parallel analysis of readily available documents and other material concerning the project, such as planning documents, programs, media reporting, floor plans and participation at a follow-up evaluation meeting held by the consortium in August 2013.

Specific research questions explored in the study were:

1) How is sustainability interpreted and realized in the housing development in Kvillebäcken, and what terminology is used?

2) How is this perspective on sustainability related to concepts of home and the development and design of living environments?

4.3.2. INTERVIEWS WITH DEVELOPERS

An interview study was planned and carried out together with Paula Femenías and research intern Guillemette Zuber during the first phase of development in Kvillebäcken. Interviews were held primarily in May and June of 2012 (with the exception of one interview held in

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1   The redevelopment process in Kvillebäcken has been studied by, among others, Olshammar (2002) in her PhD thesis at the Department of Architecture at Chalmers, and called an example of "ecological gentrification" at the "urban front" by Thörn and Holgersson (2014), further illustrated by Despotović and Thörn (2015).

January 2013) with representatives from the marketing or development departments at the companies developing housing in Kvillebäcken. In total seven interviews were conducted. One of the interviews was carried out with two interviewees from the same company present, making the total number of participants eight.

The first six interviews were held in English, and lead by Zuber, with the support of myself or Femenías (in the case of one interview). The final interview was held in Swedish by me. Possible language barriers must be taken into account, as the interviewees all are native Swedish speakers. In some cases certain interviewees might have staggered a bit in wording or needed some extra time to formulate and explain their responses, but overall the presence of at least one Swedish-speaking researcher and the general English proficiency among the interviewees contributed to a good interview flow.

It is also recognized that the presence of a secondary researcher in most of the interviews might have influenced the interviewees' attitudes towards the interview situation, possibly perceiving it as more formal, and as a result affected their responses. Yet having two researchers present made it possible to complement each other in the interview situation, and was a valuable insight for how to conduct interviews in this type of setting, moving between the occasional role of interpreter, establishing a relationship with the interviewee as a colleague in the housing sector, and asking follow-up questions as secondary interviewer.

The interviews provided part of the empirical material for another study led by Femenías concerning innovation processes among construction clients (not yet published), and the interview guide (in English; see appendix A) was designed to reflect this dual focus, containing three sections: a general introduction to the company and the types of dwellings they build; the perceived stance on innovation and development of housing standards and concepts within the company; and identified drivers for innovation and development of concepts. The interviews lasted for about an hour and were recorded in full. The material was then transcribed and coded using markers on three levels: content relating to the company/ sector in general or to Kvillebäcken in particular; belonging to identified themes of the interview; or specific to subthemes that might or might not be recurring throughout the interviews. Emerging patterns were analyzed looking both in depth and in relation to the material as a whole. In order to visualize patterns in the terminology used, a quantitative text analysis was also conducted, with the help of doctoral student Mikael Mangold, based on the themes revealed in the analysis (further detailed in Paper A).

4.3.3. FOCUS GROUP WORKSHOP WITH ARCHITECTS

To follow up the interviews and get more perspectives on the Kvillebäcken development, a focus group with the architects involved in the project was conducted in order to access multiple viewpoints on one occasion (Kitzinger, 1995; Rabiee, 2004). The focus group was planned and carried out together with Femenías and research assistant Emma Persson in December 2012. Invitations were sent out to each of the five architecture firms that worked on the project for the seven different developers (two firms worked for two developers each), and at least one participant from each firm attended. The eight participants were homogenous in the respect that all are middle-income architects employed at mid-sized to large offices, yet heterogeneous in terms of gender (three women, five men).

The session took about two hours in total and was structured into two parts. First, participants were divided into groups of two or three to discuss a series of issues: the perception of sustainable development within the housing sector; significant components or aspects of sustainability identified; the perceived norms prevalent in contemporary design and the potential for housing concepts that challenge these norms. This first part allowed participants to discuss the respective questions freely in smaller groups, with the idea of making it easier for each participant to be heard, moving around in the workshop space accompanied by one of the researchers observing and documenting.

The second part took the form of an open focus group more specifically addressing the role of the architectural profession in a sustainable housing development. This part was also documented in writing by the three participating researchers and the session as a whole was analyzed according to emerging themes in the notes. As the focus group was seen as an open space for discussion among the participants, the occasional intervention of the researchers was limited to presenting new questions or prompting further elaboration of a topic raised previously. The interest in discussing the questions seemed high, and while participants took part on more or less shared terms, the effects of group dynamics in focus groups should be considered in the context of the outcome of the discussions—for example, with regards to the development of certain perspectives as a result of sharing and hearing others who might have similar experiences, or the tendency of group discussions to generate more critical comments compared to interviews (Kitzinger, 1995). The fact that the participants came from competing architecture firms did not seem to hinder the discussion, but contributed to a comparison of experiences in the current market situation.

4.4. METHODOLOGY IN STUDY 2

4.4.1. BACKGROUND AND RESEARCH QUESTIONS

Understanding the perspectives of residents as key actors appears highly relevant in the pursuit of a sustainable housing development, yet has been rather underexplored in earlier conventional building research. Highlighting a shared people-centered approach to sustainability research, a study focusing on residents' perceptions was undertaken as part of a collaboration with Sara Renström, a doctoral student in the division of Design and Human Factors at the Department of Product and Production Development, Chalmers University of Technology.

Building upon an established research collaboration between Chalmers and HSB (the largest housing co-operative organization in Sweden), a specific housing area in which to approach residents was selected to exemplify the existing Swedish multi-family housing stock. The requirements when looking for a setting for the study were that the selected area should not have a specific low-energy or green profile, that it could provide a large enough but manageable sample size, and that the demographics in the area allowed for a range in age and socio-cultural background to gain as varied narratives as possible.

The chosen area and specific housing association is located in the urban neighborhood of Högsbo, in the western part of Gothenburg, which in large parts consists of a housing stock that is quite typical of the industrialized building processes of Swedish residential environments in the 1950s and 60s. The area is starting to change in character, and to some extent also with regards to its inhabitants, as parts undergo refurbishment and densification. The study scope was limited to households within a particular tenant-owner association called Lavetten, which consists of a mixed type of inhabitants (ranging from many elderly to young families) in a total of four blocks built in 1962.

The purpose was to get a sense of residents' perceptions, and the study thus focused on the following research questions:

1) How are notions of home and living standards perceived among residents?
2) How does this relate to their views on sustainability and their attitudes towards reducing resource use?
3) What perceptions of and willingness to engage in low-impact ways of living (including living smaller, simpler and more collaboratively) do residents express?

The study included both quantitative and qualitative elements to explore the research

questions posed. A questionnaire and subsequent interview study was planned and carried out together with Renström in the winter/spring of 2013/2014, yet comprising two separate research efforts (conducted at the same time and with the same participants).

4.4.2. QUESTIONNAIRE

In the first part of the study, questionnaires (Ejlertsson, 2005) were distributed to all 306 households in the Lavetten housing association, placed directly in the apartments' mailboxes, including a link to an online version with individual access, as well as a return envelope for those preferring the paper version, and a minor incentive in the form of a chocolate bar. As a primary purpose of the questionnaire was to see how environmentally aware and/or concerned the residents could be said to be, the questionnaire included selected International Social Survey Program (ISSP) standardized questions on environmental attitudes and actions (with Swedish translations from Svallfors & Edlund, 2011), allowing comparison to national and international data, as well as a section regarding values (based on Steg et al. 2014; de Groot and Steg, 2008; and Swedish translation from Matti, 2009).

A section on perceptions of home was included to explore judgments on home and possible correlations to environmental attitudes (Appendix B). First, a free text question was included, asking for three words respondents associate with the term home. Examples were given (apartment, family, shelter) in order to avoid potential ambiguity regarding how to understand the question, though the examples might have provided a bias in terms of the use of particular words. This was followed by a section with a set of Likert scale items, totaling twenty-one statements, relating to categories of meaning of home, with five-point scales ranging from "strongly agree" to "strongly disagree" (see Appendix B for full list of items in Swedish, as this was the language used in the questionnaire). The items were based in part on ten clusters described by Després (1991) and as seen in Table 1 (Chapter 3). This was complemented with a consideration of van der Klis and Karsten's (2009) material, activity pattern, and social dimensions of home (the latter also explored by Tester & Wingfield, 2013); symbolic aspects, particularly relating to social status and expression of identity (Gram-Hanssen & Bech-Danielsen, 2004; Hauge and Kolstad, 2007); as well as elements of ownership (Windsong, 2010).

The response rate on the questionnaire was 51% (n=156), with no reminders. Descriptive statistical analysis was conducted using SPSS software. As the variables are of a principally

qualitative character, and in line with behavioral science research, a non-parametric statistical approach was taken (assuming that the data does not follow a normal distribution).

The questionnaire provided me an opportunity to learn the theoretical basics and how to practically perform analysis in SPSS. The experience working with a questionnaire and subsequent analysis, however, highlighted the limitations of quantitative findings on their own in gaining a better understanding of residents' perceptions, as well as the potential limitation in my own proficiency in working with this type of data.

The results, as described in 5.2 and in Paper C, show that while the questionnaire could confirm certain theoretical assumptions regarding concepts and clusters of meanings of home, the originally intended exploration of the correlation between judgments of home and environmental attitudes and actions could not be supported in quantitative terms. While the questionnaire provided a good basis for assumptions regarding the general attitudes held among residents, it did not provide a deeper understanding of the probably more complex, but nonetheless relevant links that no doubt exist between how residents perceive and construct home (and their practices within it) and how they perceive the need for reducing the environmental impact of contemporary society and their own role in doing so. It could also suggest that the items used in the questionnaire are perhaps not appropriate, or that the analytical basis for correlations (correlation being a quite rudimentary indication in itself without regression) was weak.

4.4.3. INTERVIEWS
In order to complement the broad but shallow data provided by the questionnaire, semi-structured interviews were carried out with residents recruited from the questionnaire study. 43% (n=67) of questionnaire respondents said they were willing to participate in the follow-up study, yet the number of interviews had to be limited due to the scope of study and time available. To provide relevance in line with the dual research interests of the study, participants were first narrowed down based on the scoring on certain questionnaire items (relating in part to Renström's study focus on heating and in part to the section on home, where a breadth in scores on home-related items was sought in order to provide a range in perspectives). The selection of participants was also based on demographic diversity with regards to age group and gender in order to get a variety of perspectives. A compensation for those participating in the follow-up study was given in the form of two cinema tickets.

In total, twenty-two interviews were conducted between the end of March and beginning of April 2014. Thirteen of the interviewees were female, seven male, and for two of the interviews the responding participant was joined by their partner. Interviews were held in participants' homes, at the housing association's office, or at Chalmers, based on the interviewee's preference. The difference in setting meant that additional insights that might have accompanied the interviews conducted in residents' homes were not available for all interviews. This was weighed against the convenience for the interviewee, accommodating whether or not participants felt comfortable having researchers enter their home.

Being two researchers with complementing perspectives meant that while our separate interests corresponded to two separate blocks during the interviews, we could support each other in the respective sections. As with Study 1, the presence of a second researcher must still be acknowledged as influencing the interview dynamics and potentially the interviewees' perceptions of the situation. In particular the familiarity of conducting interviews in people's homes also demanded a sensitivity in our roles as interviewers, as the interviews took a form of semi-structured, "in-depth conversations" (McCormack, 2004), with interviewees sharing personal narratives from their home life.

An interview guide was used, containing three parts (see Appendix C for the full guide in Swedish). The first part regarded interviewees' housing biography, notions of home and aspirations; the second part addressed issues of housing standards and perceptions of alternative ways of living to save resources, including living smaller, simpler and together with others; and the last part concerned more general questions on contemporary housing development, including "green" housing. Interviews ranged in length from about forty minutes to just over an hour. All interviews were recorded and transcribed in full. Analysis of the transcribed interviews was done using NVivo software. Coding was done in accordance to pre-defined themes based on the interview guide, as well as from emerging themes. A particular interest was placed on complementing the questionnaire material, exploring narratives that developed (or did not develop) during the course of the interviews.

4.5. METHODOLOGY IN STUDY 3

4.5.1. BACKGROUND AND RESEARCH QUESTIONS

The last of the three empirical studies focused on people that have intentionally chosen to engage in various low-impact ways of living, in order to diversify perspectives and highlight

practices that are relevant to explore as part of transitions that might have to take place in the broader society. The study was conceived to once again explore residents' perceptions, this time also looking at resident practices that have the potential to reduce the strain on resources. Of interest were the manifestations of these practices in the home environment, and possible implications this has for how home is conceptualized and operationalized (put into practice).

As one of the cases studied in the Beyond GDP Growth research project, the municipality of Alingsås provided a starting point. The municipality is part of the larger Gothenburg region in western Sweden, yet offers a somewhat peripheral and more affordable setting in relation to the metropolitan urban center, and has a relatively high concentration of initiatives for sustainable local action. Although several examples of low-impact living could certainly be found in different locations around Sweden, by choosing not to look at a more remote rural area the study also (perhaps somewhat paradoxically) situates the practices explored as in certain ways less extreme alternatives to contemporary development. Alingsås is also a relatively significant hub of activities related to a local chapter of the Swedish transition movement, and while the study developed to involve people who are active within this movement, it was not intended as a study of the transition movement in itself, but rather how ideas of transition are translated into home practices.

The study addressed questions regarding:

1) How are notions of transition and sustainability perceived among households intentionally seeking low-impact ways of living?
2) What types of low-impact everyday practices are engaged in (or intend to be engaged in) and (how) are these manifested in the home?
3) What motivations and conditions are conveyed in regards to these practices?

4.5.2. HOME VISITS AND INTERVIEWS

The data collection and analysis was conducted by me, while the subsequent paper was written in collaboration with Karin Bradley.

Study participants were found through snowball sampling (Noy 2008). Initial contact was made with certain interest groups (including posting on online forums for Transition Alingsås and similar groups), as well as with professional or personal acquaintances with a connection to Alingsås and a known knowledge or interest in questions of sustainable

building and planning, alternative economies, or transition practices. Through referrals a topically appropriate yet limited selection of residents was achieved and saturation was noted when multiple referrals were made to the same person.

In total, nine people from seven households were interviewed, of which four people were interviewed in their respective couples, while the rest of the interviews were held with only one of the householders. In some of the interviews, children were present or in the vicinity, yet did not participate. The study thus did not treat each participating household equally, and it should be underlined that it is the perspectives of the individual householders that were explored, not representations of complete households. The interviewees are quite homogenous in terms of socio-economic status, which could perhaps be attributed to the selection process, providing a bias towards certain types of study participants, but might also say something about the make-up of the people engaged in these types of intentional endeavors. All but one own their home and most live in detached houses.

The interviews were conducted in May and June of 2015, and took the form of home visits. They started with a tour or walk through the dwelling and around the property (if applicable). This provided in-home observations, which gave insight into the home environment and offered at least a hint of the everyday configuration, as well as establishing a good basic understanding for me to take with me into the interviews. It also provided a material dimension to the practices discussed, a physical setting where the spaces and artifacts used in interviewees' daily lives were made visible and thereby possible for interviewees to refer to directly. The walk-throughs were unstructured, so residents could explain the layout and use of the different spaces or functions, and offer narratives along the way. This was documented in rough notes and occasional photos.

A semi-structured interview guide (in Swedish; see Appendix D) focused on their previous housing experiences, their current dwelling, the practices they engaged in, and their perspectives on the future. Interviews ranged between 1 and 1.5 hours and were recorded and then transcribed in full. A short follow-up by means of telephone was also conducted a few months after the visits, which was found to be very valuable. The collated material was then explored with regards to the narratives conveyed, following emerging themes as well as in relation to the pre-defined research questions, emphasizing the interpretation of interviewee's accounts as "storied ways of knowing" (Riessman 2005).

5. SUMMARY OF RESULTS

This chapter first briefly presents the key findings of each of the three empirical studies (a more detailed account of the results can be found in the corresponding papers). The study insights are then comparatively analyzed with regards to contextual differences, and the diversity in perspectives found across cases, providing a basis for further discussion, as presented in Chapter 6.

5.1. STUDY 1: GREEN MARKET ACTORS

The first study can be seen as providing specific insights in the Kvillebäcken case, but also addresses perceived developments more broadly as expressed by the study participants in their views on sustainability and the concepts (or images) of home conveyed in new housing development. The findings can be split into two main aspects summarized in bullet points below, with a series of subset issues that were revealed (corresponding to Papers A and B):

Regarding the *interpretation of sustainability in housing*, it appears that:

- a focus on consumption, comfort and convenience in modern dwellings is upheld in the housing built in Kvillebäcken
- a focus on efficiency measures is prevalent, particularly new technology that allows for a maintained or improved housing standard
- a consideration of equal opportunity on the housing market is often not adequately met in market developments such as Kvillebäcken, and while visions of diversity might have been raised in early stages of planning, they have not necessarily been translated into what is built
- further considerations of socio-economic sustainability aspects appear lacking

Regarding the *development of housing concepts*, it seems that:

- innovation in the housing sector is low when it comes to design for 'new' forms of residing, as visible in what is built in Kvillebäcken, although a difference between companies can be noted[1]
- the sector is adapting to a growing individualism and rise in single households, with subsequent limitation in market scope and increased costs
- resident engagement or co-creation remains underexplored or limited

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1   *New* is here seen as challenging mainstream configurations and providing alternative residential solutions. A study of apartment layouts in Kvillebäcken shows that the larger private build-and-sell developers tend to build more streamlined and heterogeneous housing than the smaller private or public companies.

The interviews with developers reveal that several of the companies try to generally implement low-energy or even passive house standards in the housing they build, supporting the trend of such measures within the sector, where the focus appears to be on technical innovations and market-set standards. Although an outspoken objective (in vision documents and marketing efforts) surrounding Kvillebäcken was to enable a more sustainable lifestyle among residents, more radical solutions or strategies challenging the energy and resource intensity of current ways of residing are not apparent. Developers are working on how to meet sustained residential norms with efficiency measures, with an emphasis on easily measurable indicators of environmental impact.

Despite initial goals regarding diversity in Kvillebäcken, the interviews generally show the market necessity of streamlining apartment types and sizes towards smaller one- or two-bedroom units. The focus group with architects supports the general notion that competence in social issues appears to still be low within the sector. Opportunities to explore more innovative designs to optimize resource use or address new types of household configurations, according to the architects, are lacking. This could also be related to an overall lack of perspectives and discussion within the sector on the home and home practices, limiting architects to rather shallow understandings of the social and everyday activities that shape and take place in residential environments.

The role of the resident is highlighted in the interviews, mainly as a consumer of the product offered. Focus on what is perceived as social values or quality of life is partly discussed, with some companies working to improve opportunities for interaction and creating greater value for the residents. A distinction should also be made between companies building for sale or those building for their own long-term property management, where the relationship to the resident differs.

The narratives offered in the interviews and focus group suggest that economic issues and the current market system tends to dominate—something that is further supported in the quantitative text analysis of the interviews (see Paper A for a detailed outline of this), with "the market" being spoken of more often than the environment or social values. Economy is in general considered to be an underlying driver for the concepts that companies work with, imposing limitations for new interpretations and concepts.

In summary, the results from Study 1 suggest that while Kvillebäcken might be seen as a successful example of *relative* improvements in terms of the greening of the housing sector,

a wider perspective on sustainability and a radical reimagining of the resource and energy intensity of contemporary housing is not necessarily found. Instead, the efforts engaged in could be seen as partial market interpretations of sustainability operating within current conventional conceptualizations of home.

5.2. STUDY 2: ORDINARY RESIDENTS

The second study provides both quantitative and qualitative results, yet underlines the value of primarily qualitative approaches in exploring the potential and conditions for engaging in low-impact ways of living, situating residents' narratives in a larger web of everyday life. While the questionnaire was used to explore potential correlations between residents' environmental opinions and how they view the home, an exploratory factor analysis did not provide any significant correlations between environmental values and notions of home, nor between notions of home and frequency of engaging in pro-environmental practices. Summarized key findings from the questionnaire and interviews (described further in Paper C) instead indicate that:

- Respondents in this tenant-owned housing association are not more (or less) environmentally conscious than the fairly high Swedish average (ISSP 2010)
- While not necessarily drawn to housing specifically marketed as environmentally friendly, interviewees are positive towards continued efforts in the sector
- The narratives surrounding home and housing aspirations expressed reproduce prevalent trends and norms regarding:
  - an emphasis on safety, family, comfort and convenience;
  - the home as a place for social representation;
  - notions of a "housing career" and improving one's standard of living
- The idea of living smaller or simpler to save resources is something several interviewees could consider, but under various conditions and with varying motivation, where "sufficiency" practices are weighed against these social norms
- Incremental resource sharing and forms of co-housing are seen as aspects for development, given that such practices are easily facilitated

The questionnaire results indicate that the residents can be considered average in terms of reported environmental awareness as compared to national and international data, something that was further supported by qualitative insights from the interviews.

All interviewees have come into contact with areas or buildings that are marketed as environmentally friendly but also interpret what this might entail in different ways, revealing an expressed skepticism towards construction and housing companies being able to truly drive a more sustainable housing development without policy incentives or increased influence from residents.

Regarding items on home, precedent research findings on clusters of meanings were confirmed, suggesting that respondents do not stand out particularly when it comes to how they view the home. A word analysis of the free text associative question was also conducted, revealing that the most used word by far to associate with home (n=78) was "safety" (*trygghet* in Swedish). The second-most used word (n=43) was "family," which was one of the words suggested in the phrasing of the question, and hence should be regarded in light of this potential bias[2]. The third-most used term (n=34) was "comfort" (*trivsel* in Swedish, signifying wellbeing and coziness rather than thermal comfort).

Connotations to comfort and convenience seem prevalent in defining the "good home" among interviewees, and aspects of social representation, for example, appear to be important when considering spatial needs. However, a dynamic in the negotiation between perceptions of material and spatial standards, resource conservation, and quality of life is proposed. Over half of the interviewees state that they are willing to lower their standard of living, and most interviewees could consider or would even welcome a reduction in home-related consumption. Two-thirds of interviewees also say they could consider living smaller. It cannot be assumed, however, that this means these residents would choose to actively seek a lower standard, as the interviews only dealt with reported opinions and intentions, not how this is translated into practice in the particular context of each household.

Concepts of sharing resources, spaces or housing functions do not appear so strange to the interviewees. While several say they have discussed perhaps living with others, such as family or friends, barriers to making such a change in living situation still persist in the form of both social aspects (with whom to share, how would it work, division of responsibilities, etc.) and the lack of mainstream housing options that could accommodate this, demanding that they self-organize and create such alternatives for themselves.

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2   However, it should be noted that another of the suggested words, "apartment," was not significantly more used than others, indicating that respondents did not simply use the pre-given suggested words without motive, but perhaps rather that these words made certain associations more salient than others.

In summary, Study 3 explores the different obstacles and possibilities for adopting less resource-intensive home practices (including living smaller, simpler and more collaboratively) as expressed by "ordinary" residents, and shows that while an openness to low-impact living can be discerned, this is negotiated in relation to social norms regarding a good life and comfortable home, as well as opportunities in the current housing market.

5.3. STUDY 3: HOME FRONT TRANSITIONERS

The main results from the third study (presented in more detail in Paper D), revolve around how notions of transitions beyond a resource-intensive growth society are translated into everyday life, and the meaning this has for home practices. The study shows how people have chosen to live with the intention of a lower environmental impact or as part of a different societal configuration, highlighting narratives on what is being done in and through the home. Key findings can be summarized as:

- Interviewees share a criticism of modern consumption society, environmental degradation, and the current economic system, which are found to be primary motivations for challenging contemporary ways of living
- Problematizing a mainstream understanding of sustainable development, the concept of resilience is seen as a framework
- This is further reflected in the practices engaged in, revolving mainly around self-sufficiency and voluntary simplicity
- By intentionally seeking ways to 'step outside' of the housing market and mortgage system, the home is framed in terms of interdependence, enabling downshifting in terms of work hours within the formal economy
- While the houses inhabited could be considered conventional, the use of the home environment entails 'alternative' functions, including:
  - experimentation and the home as a practical workshop;
  - reskilling and the home as a knowledge center,
  - the home as a site of production (of food etc.)
- Collaborative strategies are seen as important for building local resilience, although barriers exist in terms of social and structural organization
- Focus is shifted from a contemporary market discussion of housing standards and finishes to what you can do in and through the home

Trajectories of how and why to transition, as well as from and to what, along with interpretations of sustainability differ among interviewees' narratives, yet their choice to seek a different way of life is based on a common criticism of current systems and the perceived vulnerability of large-scale systems in the face of global as well as local environmental and social challenges. Interviewees highlight the need for increased self-sufficiency and relocalization of resource loops that have been centralized in contemporary development.

The narratives interviews give suggest a less financially dependent view of the home, linked to possibilities for downshifting and finding values outside of contemporary consumer logics, and emphasizes aspects such as closeness to nature and conviviality. Many of the practices engaged in demand work hours to be at least partly diverted from gainful employment in the mainstream economy to tasks relocated to the home environment.

Narratives regarding their current home and previous housing experiences speak of finding sufficiency and having less of an interest in conspicuous consumption to express identity through material things in the home. In comparison with contemporary norms, living with lower spatial, thermal, or material standards is discussed from different perspectives, including the *potential* of living more compactly and/or more collaboratively (although most interviewees could not be said to live significantly smaller or more collectively than the national average), having less stuff, or changing practices related to personal heating. The home is positioned as both a private and semi-public arena—a node of everyday life—where space for personal contemplation and inner reflection is coupled with the use of home as a workshop of sorts, allowing for experimentation, hands-on shared learning, and knowledge transfer.

The study tells another narrative of sustainable living—beyond as mainstream representation in urban eco-districts (as relating to Study 1), as well as other alternatives including for example eco-villages. The "home front transitioners" that this study focuses on situates transitions in the everyday and incorporates low-impact practices in the existing fabric, even in a semi-rural context. The potential of clustering in the future, to form village-typologies is also upheld, enabling a "collaborative self-sufficiency".

In summary, Study 3 explores how concepts of home and home environments could be positioned as a center and premise for transitions to a low-impact society. By focusing on how the home is operationalized in relation to these practices, the study emphasizes what is done in the home rather than a particular one-size-fits-all techno-centered solution.

5.4. CONTEXTUAL ANALYSIS

A cross-analysis is presented here to allow for a comparison of the particular study contexts, complementing the individual papers with more contextual data. The three study contexts, while all in the greater Gothenburg region, differ to some degree in terms of the socio-economic and structural conditions that might shape discourses on sustainable housing development. It is recognized that an analysis of the results needs to take into consideration contextual specifics such as demographics, infrastructural and locational factors (with respect particularly to interlinked practices such as mobility), and the type of building typologies assumed, including assumptions regarding material flows and energy performance. These aspects are briefly addressed below, while the conceptualizations of "sustainable home" and potential contrasts, are discussed further in the next chapter.

The three studies should first of all be understood in the social and economic context of the respective areas in which they are situated. The Kvillebäcken development (Study 1) is marketed towards a target group of "conscious urbanites", and assumes a certain income to be able to afford the cost of newly produced apartments, suggesting a bias towards upper-middle-class (white), able-bodied, and active people to inhabit the new area[3]. The location and rethoric surrounding the redevelopment of Kvillebäcken, conceived as an extension of the urban core of Gothenburg, differs from the context of Lavetten (Study 2), which is located in the district of Högsbo. For the residents interviewed in Study 2, the semi-urban or suburban location (these definitions are changing as the city grows—see figure 8 for a very simplified map showing the relation to the city center), is seen as allowing somewhat lower housing prices[4]. Still, a cross-analysis must also recognize the generally privileged position implied in all the three studies. Aspects of for example education level and economic class must be considered in the ability to willingly lower living standards or downshift in work hours, as in the case of Study 3 (assuming an access to housing and an adequate salary, to then be able to intentionally seek other options)[5].

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3   This can be contrasted with the larger urban district of Kvillebäcken, where 30% of residents are foreign born— higher than the Gothenburg average—and where there is a slightly higher ratio of low income inhabitants (Gothenburg City Executive Office, 2015).

4   However, the district has a larger portion of middle-income inhabitants and a lower percentage of people born in another country than the city of Gothenburg as a whole (Göteborg City Executive Office, 2015).

5   The studies do not engage with a more profound justice perspective in this sense, exploring for example the position of those living in the parts of town where levels of unemployment and over-crowding are high.
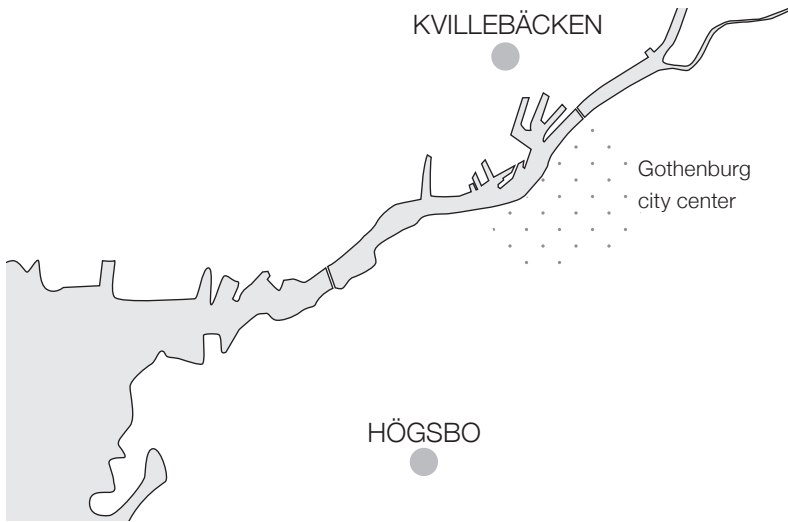
Figure 8. Simplified map of Gothenburg and the locations for Study 1 (Kvillebäcken) and 2 (Högsbo)

The interviews support assumptions of Högsbo, and Lavetten in particular, as being a type of area that is quite 'average' in Sweden. This is especially true when comparing to the more rural context of the households in Study 3, which could be perceived as standing out in relation to the trend of urbanization and densification, which was commonly referred to throughout the interviews. Perhaps the studies could be seen as a continuum of sorts, with Kvillebäcken on one end and Alingsås on the other.

Because the participants in Study 3 live in different parts of Alingsås municipality, the context cannot be as easily compared[6]. The municipality can be considered part of the semi-rural periphery of the greater Gothenburg region, and has a population density of 83 inhabitants/km2, with 60% of the municipal population living in the town of Alingsås itself (24,000 inhabitants). While Kvillebäcken is specifically marketed as enabling sustainable mobility practices (walking, bicycling, public transport) due to its urban location, the context of Alingsås provides significantly different prerequisites for personal transport (experienced during the course of the study with respect to the home visits). On the other hand, the closeness to nature and rural land in Alingsås is essential for the practices engaged in by the households in Study 3.

6   Alingsås as a whole has approximately the same average income as Gothenburg but a lower proportion of foreign-born inhabitants (Alingsås Municipality Executive Office, 2016).

The relatively suburban context of Högsbo, where residents must travel to access more centrally located services, could suggest a potentially higher car-dependency than what is intended in Kvillebäcken, but at the same time Högsbo is highly accessible by public transport and bicycle infrastructure—especially compared to parts of Alingsås—while still offering access to nature (in the form of both parks and more wild nature). Some interviewees in Study 2 talk about an interest in growing vegetables, and see allotment gardens around the outskirts of the city as providing an opportunity for this.

Locational aspects and mobility, however, should also be put into the larger context, where high-income groups such as those who can afford to live in Kvillebäcken tend to have high carbon footprints (due particularly to flying more), and generally high levels of consumption (Larsson & Bolin, 2014). While none of the studies focused specifically on mobility practices, the difference between the different study contexts is perhaps most obviously illustrated in Study 3, where interviewees are trying to reduce their overall footprints, including air travel, yet also reflect upon the difficulty of getting by without a car in a more rural setting.

This also points towards the relevance of comparing aspects of building performance in the different studies. While Kvillebäcken had an energy efficiency goal of 60 kWh/m2/year (energy for heating, cooling, domestic hot water, and building electricity), the buildings in Lavetten average twice as much, 120 kWh/m2/year. Although an analysis of the energy use among the households in Study 3 was not made, a self-reported building energy use ranged from 62 kWh/m2/year in a house with a heat exchange pump to the equivalent of about 190 kWh/m2/year in a larger house that "had not been renovated." As no quantitative comparison was made, it is not possible to draw any larger conclusions[7]. Yet the studies problematize how we understand sustainability in housing, and the insights support previous research into various factors in a more complementing way (see e.g. Holden, 2004). This includes considering aspects of embodied carbon (including building materials), everyday household use of energy and other resources, and consumption (of both land and fuel) relative to personal transport and residential location.

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7   An average for more households could only be read as a rough guess, as in some cases the self-reported energy use was related to an energy performance declaration, in some included total electricity use, and in others was given as the equivalent of burning self-grown firewood to heat the house, making it hard to compare between energy forms and volumes.

6.   SUSTAINABLE HOMES?

This thesis has explored diverse perspectives on and interpretations of sustainability in relation to concepts of home as conveyed in narratives among different actors. This chapter presents a gathered discussion of the theoretical and empirical work in the thesis, proposing how a potential *re*conceptualization of what is understood as a sustainable home could be understood and possibly operationalized. The chapter starts with a section exploring the concepts found in the empirical studies. This is followed by a section proposing an alternative way of conceptualizing home as a node of everyday life, and the framing of agency in transitions to a low-impact society. A final section discusses current and emerging housing developments, the potential frameworks for action, and the roles of various actors in putting transitions into practice.

6.1. CONCEPTS AND PARADOXES

Key results from the empirical studies could be summarized into two main findings that reiterate conclusions from previous research and common discourse, as well as provide new insights that highlight the complexity of approaching a sustainable housing development. On one hand, the studies illustrate the various structural lock-ins that could be found in contemporary housing development. This relates to, among other things, mainstream representations of sustainability strategies as technology-based, current norms surrounding residential preferences and household configurations, and the lack of competency and inclusion of social dimensions in the planning and building process.

On the other hand, the results propose a gap between a reported interest among residents for living in less resource-intensive ways, and the limited opportunities to find relevant alternatives within current market developments. This could suggest there is potential to develop both existing and new housing in a different way, but the results also point towards the need to diversify perspectives and contextualize developments towards sustainability with regards to how people live, and how they perceive and create meaning in their home environments, situated in the everyday.

Relating to the overarching research questions posed in this thesis, the concepts and interpretations found in the three empirical studies propose different challenges and potential paradoxes in conceptualizing a sustainable home. The contribution of this thesis is not to suggest a newly defined form for a single sustainable home, but rather diversify perspectives and highlight the conflicts between different structures and strategies. As noted

in section 5.4., for example, the studies problematize how understandings of sustainability are expressed among different actors, but also underline the need to discuss aspects such as carbon footprint in a more nuanced way. This is linked here particularly to concepts of home, and moreover how they are put into practice. How are different concepts of home and actual home environments perceived and used in relation to transitions to a low-impact way of life and society? The relation between concepts and practices, as mentioned in Chapters 2 and 3, is discussed here both in an abstract and concrete sense, in that concepts shape the framework for practice, where meanings and cognitions are reproduced in everyday practice as well as in more concrete terms of architectural concepts shaping what is built.

The three studies confirm rather than challenge precedent research on meanings of home as generally dealing with notions such as family or safety. Neither the "ordinary" residents in Study 2 nor the "home front transitioners" in Study 3 differ radically in their interview responses in terms of the words used to describe what a good home is. How their perspectives on home are translated into practice—what the home as a concept and as a place entails, enables, demands, and looks like—is perhaps where the interesting insights might be found instead, particularly in relation to the representations given in contemporary market discourse as exemplified in Study 1.

While comfort and convenience are perceived as important both by the market actors in Study 1 and by residents, what this means in practice can differ significantly for the interviewees in Studies 2 and 3. The integration of an increasing number of timesaving appliances in newly constructed apartments, as in eco-efficient housing developments such as Kvillebäcken, is portrayed as an answer to the ever-growing pressure of modern life. Yet this framing of convenience differs in meaning and practical implications from the sentiments expressed in Study 3, where the set-up of one's home as a multi-functional base is conceived in terms of becoming independent of, rather than locked in by, an efficiency-focused consumption society.

This furthermore connects to notions of the home as a place for restoration and refuge from the outside world, in comparison to being a center of activities, and the relation between the dwelling and the immediate surroundings. The active, green, urban lifestyles assumed and portrayed in the marketing material for Kvillebäcken are contrasted by quite mainstream apartment layouts. The common open floor plan typology could be said to limit the potential for practices other than sleeping, eating and perhaps occasionally socializing

(i.e. idealized representations of "residing") to take place within the dwelling. The open-plan layout particularly makes it more difficult to use the home in multiple ways in parallel, contrasted by the home life led by several of the households interviewed in Study 3, where the home could accommodate everything from food production to workshop space. In Kvillebäcken, with a streamlining towards smaller apartments (with less variety in floor area and smaller secondary rooms), the vision is that residents appropriate the more public urban streetscape or the semi-public courtyards for various activities—often linked to consumption—to create a basis for an attractive mixed urban district where cafés and shops can flourish. Whether this is done in practice as the area develops remains to be seen.

In the context of the more monotonous residential block structure of Lavetten, the interviewees in Study 2 nonetheless underline the socio-spatial relations that are developed, and the negotiations between private space, private use of shared functions (for example common grills or sauna), and the shared use of shared functions (play areas, gardens, weaving room). The apartments are inhabited in different ways according to the residents' needs and interests (which could be assumed to also occur over time in Kvillebäcken, as residents will change and shape their apartments to fit them). The home environments, however, at least among the interview participants, are quite typical for that form and age of housing. Also in Study 3, the conventionality of the buildings and apartments inhabited by the interviewees is noted, in that they do not differ radically from similar residential buildings. A more significant difference, however, are the practices that take place within and in connection to the home.

Another point of interest is the building materials and perspectives on materialities and standards. The energy-efficient building envelopes and clean-tech solutions implemented in the Kvillebäcken project can in some sense be seen as the opposite of many of the strategies in Study 3. In particular, the large-scale principles employed in Kvillebäcken can be contrasted by the small-scale self-built projects that two of the households in Study 3 are engaged in, which instead focus on locally sourced materials such as hay and clay, and on reused building components and alternative closed-loop systems.

The potential to develop different concepts is raised throughout the studies, and the challenge of testing new architectural solutions that could facilitate less resource-intensive ways of residing, including enabling practices other than those currently reproduced in mainstream representations, appears relevant. The low-impact home practices engaged in

by households in Study 3 (such as self-sufficiency, voluntary simplicity, etc.), and the at least positive inclination among Study 2 participants to live in alternative ways in order to reduce their use of resources (smaller, simpler, and more collaboratively) suggest a contrasting approach to commonly portrayed urban lifestyles, with a potentially lower environmental impact as a result. This proposes an approach that differs from the market interpretation of sustainable housing as a product or a "lifestyle package."

As posed in Chapter 2 and stated in the title of Paper B, energy efficient buildings in themselves do not necessarily mean sustainable homes, where relative improvements are not guaranteed to lead to absolute reductions. However, this does not preclude the potential of *certain types* of low-consuming practices (including living more compactly and simply) to be accommodated in either eco-efficient developments (as Kvillebäcken in Study 1) or in 'average' existing housing (as in Lavetten in Study 2). It instead once again raises the question of what role concepts hold in relation to practice, both in the sense of established routines within the housing sector (shifting processes to minimize environmental impact from construction) and in everyday home practices (being supported and enabled by, or carried out in spite of dominant structures in the built environment).

6.2. RE-CONCEPTUALIZING HOME IN A LOW-IMPACT SOCIETY
6.2.1. HOME IN TRANSITION
The concepts explored within the (limited) framework of this thesis pose different aspects in conceptualizing a sustainable home. One key aspect is that the concept of home holds an understanding of both basic and complex assumptions and connotations, and at the same time proposes an evolutionary dynamic. While certain discourses might frame home rather deterministically in the view on preferences and housing needs (as outlined in Chapter 3), a historic review suggests how different trajectories develop over time. Considering changing conditions for dwelling and "doing home" as linked to material, social ,and demographic changes, home practices are and will most likely continue to be transformed. What is discussed here is the potential transformative property of practices in and of the home in relation to a radically reduced resource use, but also with regards to an increased capacity for social sustainability (Braide Eriksson, 2016).

The key areas of findings can be discussed in relation to the assertion throughout the thesis of the need to diversify our perspectives on low-impact ways of living, and two

interlinked areas of insights that the work has provided. The first area of discussion deals with seeing the home as a node for sustainable transitions, framing understandings of home and home practices as a starting point rather than the dwelling as an object upon or in which sustainable technologies and solutions can be placed. The second is the importance of agency in and of the home—seeing and acknowledging residents as active agents instead of "end-users" or consumers.

6.2.2. HOME AS A NODE OF EVERYDAY LIFE

By exploring contemporary notions and functions of home (as both a place and a concept), this thesis emphasizes the role of social practices in reproducing inherently unsustainable financial, social, or resource-intensive structures—rather than seeing these as outcomes of poor individual choices. The possibility to instead see home as a node for transitions to a low-impact society is nonetheless considered dependent both on agency among various actors and on more structural change, reconceptualizing homes both in the built reality and in the mind. The home is in this perspective placed at the center or as a crucible for pro-environmental practices (linked to household as by Reid, Sutton & Hunter, 2010), emphasizing the mundane and everyday, but also situated in the political sphere as part of constructing social and feminist ecologies rather than relying on mainstream sustainable development ideologies of growth and technological innovation.

As has been emphasized, particularly in Studies 2 and 3, the negotiation of everyday life and the resulting use of energy and resources is part of the dynamic of how different home practices link and shape each other in relation to cultural beliefs, values, and norms. The use of the term "home-related practices" signifies home as a cluster of practices, with a blurred separation between practices *of* home and *in* the home (as described further in

aspirational

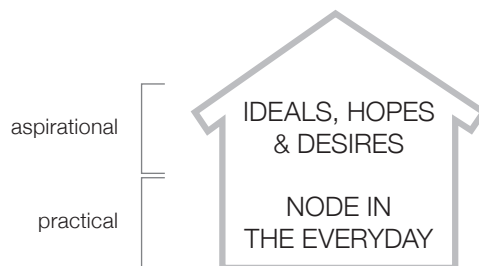IDEALS, HOPES
& DESIRES

practical

NODE IN
THE EVERYDAY

Figure 9. Home encompasses both aspirational and practical dimensions

section 3.3). As illustrated in figure 9, the home in this sense encompasses both cognitive aspects—particularly when looking at the ideals surrounding home as aspirational elements of a good life (including social status, making a housing career)— along with a practical position as a node for various patterns of activity during the course of the day.

The household as an administrative unit—commonly used when addressing resource use or spatial standards, for example—poses an interesting junction of the individual and society. There is some question, however, of the limitation of current formal understandings of system boundaries that position the home and household as separate from areas of work or public life. An alternative way of conceptualizing home in relation to sustainability aspects that is proposed here bridges this segmentation, but also challenges the tendency to bluntly categorize, for example, energy use in general terms (such the Swedish Energy Agency does in its label "housing and services"). The 'black boxing' of households avoids dealing with the complexity of practices, materialities and systems of provision that link households as dynamic and varied social assemblages, as suggested by Head et al. (2013).

Common representations of household energy and resource use relate to activities that take place at home, and the building performance linked to the dwelling unit, but do not consider that practices such as showering or cooking, for example, might also take place outside of the home—perhaps at the gym, at a community facility, or at work. A perspective on "domestic" resource use might also single out groups of residents who for various reasons spend more time at home (such as the unemployed, elderly, or those on parental leave) and thus perhaps use more resources within the traditional categorization of the household. This segmentation does not adequately address the full range of practices associated with modern life, and perhaps what we do and where we do it cannot be as clearly delimited as in current production-based categorizations.

Prevalent models for carbon calculations, informing efforts related to home energy management and building regulations, for example, are surrounded by questions of how boundaries are set, what categories of energy use are included, and also what is left out. As discussed by Walker, Karvonen and Guy (2015) in regards to a now-abandoned policy for zero-carbon residential development in England (Walker, Karvonen & Guy, 2016), different actors with potentially conflicting interests will also push for different delimitations of responsibility. Highlighting conflicting interests is also particularly relevant for sustainability measures and interventions that might be found to be misdirected
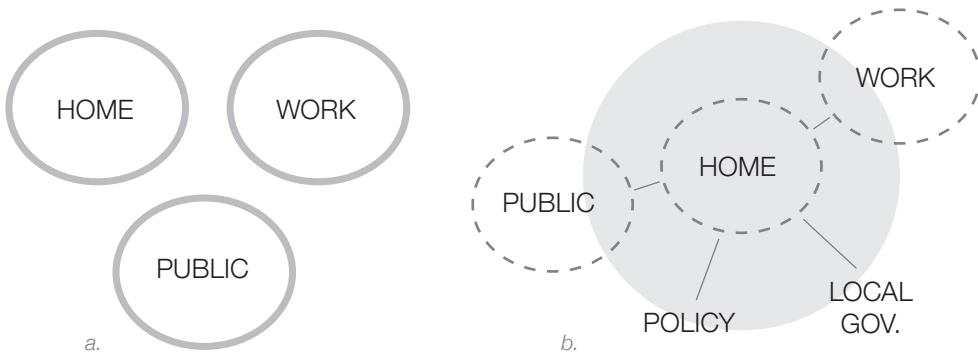
Figure 10a & b. Rather than framing "home life" as a seperate entitity, the home is here seen as a node

when put in a bigger context. Shifting the focus from buildings and technology to people and practices will need to embrace this complexity. Beyond this, the argument made here proposes a broadening of the understanding of home in relation to other aspects of society.

Seeing "home life" as something separate (in terms of how we conceptualize social and material flows) from work or public life, for example, and reinforcing such boundaries might not help us in challenging unsustainable practices. The metaphor of the node[1] is proposed here to illustrate a shift in mindset from what is perceived and often portrayed as clearly delimited arenas (depicted in figure 10a) to what could be a more useful way of picturing everyday life as interconnected both in spatial and social terms (figure 10b). The changing roles of work, home, and the public realm in a knowledge economy (both in physical terms as environments and functions change, and socially as forms of enacting the public shift) will need to be addressed as interlinked rather than separate entities. Hybridization and the use of spaces for multiple functions in a low-impact society, including the potential integration of local food production, and new forms of work or recreation with a significantly smaller footprint, will also prompt a discussion and new view of what a good life entails. In this thesis the home is positioned as a node from which various aspects of practices, infrastructure, or legislation might be perceived. This includes how we talk about local initiatives in planning and residential development, for example, or national policies for mortgaging systems and building regulations that influence how work is conceived, the formulation of labor laws or levels of unemployment, as well as other facets of society.

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1   Without going deeper into systems or computational theory, a node is here seen as a central connecting point (a cognitive or physical place) where different pathways intersect.

Highlighting questions of why and how meanings of home shape and are shaped by the built environment will demand bridging between different fields of research and practice. This can also be seen in light of the assumptions expressed in the introductory chapter, where the approach undertaken in this PhD work, rooted in an architectural/design research setting, can complement the dominant technical and sociological understandings of (sustainable) homes. By bringing in an understanding of architectural elements and socio-spatial relations, as well as relations between spaces, artifacts, and the use of these, the clustering of practices of and in the home becomes far more complex.

6.2.3. AGENCY IN AND THROUGH THE HOME

If current concepts tend to lock in unsustainable structures, the above proposed model of seeing home as a node looks at how practices are related across time and space, and at the socio-technological and socio-ecological possibilities of finding new ways of living. Rather than applying solutions to the dwelling as an object, this perspective assigns an agency to residents and other actors as part of reshaping sustainable homes (and societies).

Various interpretations of sustainability and the home in relation to living less resource intensively found in the studies presented here emphasize the difference in perspectives when it comes to the role of residents as either being part of or challenging the reliance on large systems that characterize contemporary housing development. Among the market actors interviewed in Study 1, residents are framed as consumers and the concepts developed in mainstream projects, including Kvillebäcken, are largely based on indirect demands surveyed as willingness to pay for certain amenities. In contrast, the residents participating in Study 3 and some in Study 2 question whether the transitions needed will be found in large-scale technical systems driven by the housing and construction companies that currently operate in a speculative housing market. There appears to be a reluctance to rely on market mechanisms to create significant change without a shift in policy, institutions, community, or individual action. A will for independence and resilience expressed in Study 3 especially stresses degrees of self-reliance and self-management.

A house or apartment is one of the biggest investments in life, and the sunk cost of rent or loan payments is tied to the contemporary set-up of society, including employment forms, mortgage systems, and social networks, but also aspects of mobility and urban infrastructure linking residential, commercial, and industrial functions. Within a linear

growth model, this in turn relates to a perceived constant or increasing need for a job, a car, artifacts to fill one's home, and so on. While the development in Kvillebäcken might challenge some aspects such as mobility, it enforces and assumes a continued consumption-oriented framing, not least with respect to the high cost to rent or buy an apartment. By operationalizing home as the households in Study 3 are attempting to do, the focus is shifted from current economic structures (which are intertwined with urban and residential planning) to potentially new ways of organizing life.

This position on agency can be discussed with respect to the theoretical framework on levels of change presented in Chapter 2. As expressed by interviewees, a true transition is not necessarily possible without social support and a larger transformation of society. Yet seeing home as a convivial framework or tool, the active relationship between residents and their home environments emphasizes lay (or situated) knowledge and interpretations. Employing a transformative understanding positions residents as not only co-creators of their own living environments but of society, suggesting a potentially different starting point for engaging with a sustainable housing development in practice and in research. By emphasizing the conceptualization of home as one central aspect, discussing the actors involved in shaping this becomes key. Not only does the work presented here suggest reframing residents as agents of change in transitions to more sustainable ways of living, it potentially challenges the processes surrounding housing development altogether.

6.3. DEVELOPING SUSTAINABLE HOMES

As emphasized in the beginning of this thesis, perspectives on the challenges of developing existing and future sustainable residential environments depend on a broad approach to understanding home, in which social and behavioral sciences will need to play a larger role. This will in turn need to address current interpretations, societal and political-economic systems, current and future technological development, as well as resulting design solutions. Integrating these perspectives becomes increasingly indispensable when discussing the informed development of environments with a radically reduced resource intensity.

With many different actors involved in the housing development process, agendas and perspectives can also differ. With a major influence on housing development in contemporary Swedish planning and building, market actors hold a key role. Study 1, exploring perspectives among market actors, poses a range of paradoxes and possibilities

for future development within or outside of current mainstream rationalities. The concepts and narratives offered by developers and housing companies appear to differ with regard to the organizational prerequisites among the companies, as well as with regard to the forms of tenure for which they build. In this sense, the various actors might themselves be limited within current structures. In Kvillebäcken, the larger companies building to sell upon completion unsurprisingly appear less prone to talk of long-term perspectives and reflect upon how the new residents will inhabit and interact with one another and with their new housing. Perspectives on quality, and the willingness to engage in what is perceived as more time consuming and costly work in the short term (such as landscape architecture, or careful placement of installations, outlets etc. in the apartments), also differ among the companies. Some, particularly those building rental apartments that they will manage for the foreseeable future, express the importance of choosing materials and solutions that will age and be maintained sustainably. As a result, there is already a visible difference between the blocks built by different companies.

However, there also seems to be an awareness of streamlining of concepts, where companies follow each other and the market assessment they make. While market surveys and companies building within the current development framework are starting to pick up on new trends such as the collaborative economy (sharing stuff and spaces), or for example the need for more affordable housing, many market actors can still be considered quite reactive. Examples such as Kvillebäcken should of course be understood as raising the bar within the sector, yet what is illuminated in this example and throughout the thesis is that although this type of eco-efficient development is an improvement in terms of building industry practice, it does not really propose a new housing concept. As such, it might miss the mark when compared with the need for transitions to meet overarching goals of social justice within planetary boundaries.

While the studies may not have looked at more experimental examples, it must still be stressed that developments in housing are progressing, particularly in relation to resource use and social aspects. A lot has happened just since the beginning of this thesis work, including new forms of co-housing, ongoing projects related to establishing Living Labs on and off university campuses and other forms of experimental zones for the building sector to push the envelope and drive sustainable housing solutions further, along with many other types of both small-scale and larger projects driven by residents, public housing companies,

cooperatives, and others. This is a positive indication of change, and the ambitions expressed in the sector will be essential for driving new market interpretations.

This can nonetheless be further discussed in relation to the role of laws and policy, where developers tend to portray regulations as hindering. At the same time, the architects participating in the focus group in Study 1 ask for greater engagement with social issues, something that might lie beyond the current competency (and responsibility) of construction or housing companies. This suggests there is a role to fill in mediating between special interests (mainly of private companies building for sale, but not exclusively) and common societal interests (assumed to be carried by an increasingly pressured public planning authority in the face of struggles between quantity, quality, and sustainability).

The findings as a whole illustrate the range and vagueness of the demands that shape the context within which the housing sector operates, surely contributing to a rather restricted development. Moreover this thesis emphasizes, in the different contexts of the three studies, that there is a need to diversify the range of actors as well, something that is highlighted in recent public discourse on how to address the major challenges of housing shortage, affordability, and environmental issues in Swedish housing development (illustrated in opinion articles discussing the possibility for smaller actors, as for example by Stark & Nordahl, 2014, or in a report by the Swedish Competition Authority, Konkurrensverket, 2015). There is a potential for new actors to play a larger role in shaping the development, which also should include non-profit, municipal, cooperative, and other actors that operate outside the dominant market logic. The prerequisites for this might need to differ from current processes, including policy changes and incentives to break structural lock-ins.

Another question is how residents are engaged in these processes. Study 2 indicates that while average residents might not always be the ones who will drive a change towards living smaller or more collaboratively, such as initiating co-housing projects, they are nonetheless a relevant group for new initiatives or alternative developments run outside the current market logic. Study 3 instead deals with people who are intentionally trying to create the premise for another form of living within the framework of still quite conventional configurations, and see other possible barriers as well as opportunities. Here the co-creation of planning and infrastructure, in addition to enabling people to create more collaborative clusters depending on their level of engagement and social or financial capacity, is a possible point of development.

7.   CONCLUSIONS

As stated in the introduction to this thesis, the aim has been to broaden discourses on less resource-intensive ways of living and residing, and to explore conceptualizations of what a sustainable home is. This is supported by empirical insights from three studies, providing different perspectives from market actors and residents. This final chapter starts with an outline of the implications of the empirical findings in relation to the research questions posed, and addresses the relevance of the thesis in terms of the contribution it provides and the recommendations it makes based on the perspectives presented. The thesis is then concluded with a reflection and outlook for further research.

7.1. IMPLICATIONS, RELEVANCE, AND RECOMMENDATIONS

Over the last decade, and particularly during the last few years, the number of projects concerned with sustainable residential development has increased both globally and in the particular context of affluent, high-consuming countries such as Sweden. Nevertheless, contemporary development still faces major challenges in meeting housing needs (relating to issues of affordability and equal access) and addressing patterns of overconsumption that contribute to a continued strain on natural resources. The work presented in this thesis takes its starting point in assumptions regarding the need to address the environmental and social problems associated with the way we build and use our residential environments. It posits the need for major changes towards a low-impact society, supported by solutions and processes that enable more sustainable ways of living. How we view the home and what it means to reside has a large impact on the energy and resource use of our built environment, regarding for example levels of spatial, thermal or material standard. Residential practices and conceptualizations surrounding energy and comfort, for example, or the type, size, and use of dwellings are key aspects in reducing environmental impact, and this thesis places an emphasis on a people-centered approach to sustainable housing development.

The research questions pursued in the thesis can be seen as iterative and interlinked in approaching the assumptions raised above. This is further reflected in the methodology, employing a primarily qualitative approach in looking at how a sustainable home is conceptualized by different actors. The first of the three research questions posed addressed interpretations of sustainability and concepts of home found in contemporary housing development. This has been explored in all of the empirical studies, providing perspectives ranging from developers and architects involved in a new "green" urban development project

(Study 1) to "ordinary residents" in a typical tenant-owned housing association (Study 2) and residents engaging in low-impact practices on the "home front" (Study 3).

This furthermore relates to a second research question about how interpretations and concepts might differ between actors, and about the potential conflicts or paradoxes, in terms of reaching overarching environmental and social goals. Comparing the concepts found highlights the gap between (improved) building performance and finding sustainable ways of living *within* the buildings. Problematizing interpretations of sustainability among the different actors, the first of two main areas of empirical findings presented in this thesis propose that a unilateral focus on technological solutions within current systems, illustrated in Study 1, could contribute to a lock-in that does not truly challenge the resource intensity of modern society and contemporary residential developments.

Elaborating upon this, the third research question looked at how different conceptualizations of home might relate to the potential for transitions to low-impact ways of living, going beyond a unitary understanding of sustainable solutions. Normative concepts of a good home that appear prevalent in all of the study contexts, revolving around notions of family, safety, or comfort, do not necessarily call for new meanings of home. Instead they could be discussed in terms of how these concepts are operationalized. The practices engaged in by the households in Study 3, such as self-sufficiency and voluntary simplicity, emphasize different aspects of safety or comfort than the representations given in Study 1, where the consumption of technical solutions is seen to simplify life and where developers speak of convenient modern homes.

The varying contextual factors among the three studies pose different prerequisites for what might be considered a sustainable way of residing. The negotiation of everyday life in relation to resource use is underlined, where social norms and practices shape how residents view the possibility of reducing levels of consumption, of living smaller, or sharing with others. While the empirical material does not provide any guarantee that attitudes reported among residents in Study 2 (as well as Study 3) are translated into action, an expressed positive inclination and openness toward different ways of living is nonetheless relevant to note, particularly in relation to the limited availability of housing that can facilitate this.

In mainstream discourse, notions of individualism and consumerism tend to dominate. Collaborative approaches, owner-built initiatives, and other types of alternative housing processes and projects are challenging these market assumptions, yet remain quite marginal.

A second main empirical finding underlines this gap between a potential willingness to engage in various low-impact ways of residing on a more incremental basis and what is currently built or conceived of as sustainable housing. A more nuanced understanding is suggested to bridge the posed dichotomy between mainstream and alternative narratives. The insights from Study 3, although focusing on more intentional alternatives, further support this as transitions are situated within the existing and in some ways quite conventional stock, enabling low-impact practices to different degrees. The empirical material offers insights regarding several structural barriers (including infrastructure, forms of production and consumption, and economic systems), and it is moreover recognized that not all residents have the interest or capacity to engage in processes that challenge these. As stressed by one of the interviewees in Study 3, there are no one-size-fits-all solutions.

Both of the main findings—revolving around the mainstream lock-ins and the potential gap between what is currently offered and a potential interest among residents—are not necessarily too surprising, yet appear particularly relevant for ongoing discussions within sustainable housing development. As market actors hold an important role in housing development in Sweden, combined with the lack of more significant incentives for experimentation in the current context of housing shortage (along with a generally risk aversive sector), what is built tends to reproduce certain normative assumptions in streamlining market interpretations of residential preferences. While several of the actors interviewed seem to consider the incorporation of more integrative approaches to be key to the advancement of sustainable housing development, the reported drivers for such a market development still appear to largely adhere to a current economic understanding.

As simplified in figure 11, the two key findings thus relate to the claim of diversifying perspectives on low-impact ways of living, and are linked to two areas of discussion and potential recommendations raised in the thesis. First, attempting to find ways of going beyond current unilateral interpretations and lock-ins, a new way of conceptualizing the home as a node for sustainable transitions is suggested, framing understandings of home and home practices as a starting point rather than seeing the dwelling as an object upon or in which sustainable technologies and solutions can be applied. This is not only conceived as a theoretical model contributing to a potentially changing field of sustainable building research, but calls for a change in practice. It calls into question how boundaries between home and work are drawn, how resource use is attributed in relation to this segmentation,
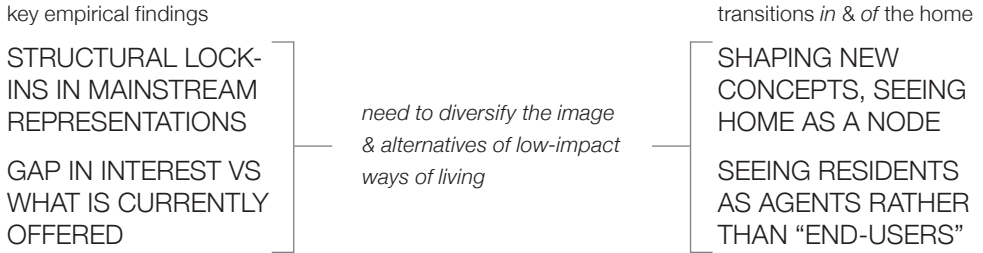
STRUCTURAL LOCK-INS IN MAINSTREAM REPRESENTATIONS

GAP IN INTEREST VS WHAT IS CURRENTLY OFFERED

need to diversify the image & alternatives of low-impact ways of living

SHAPING NEW CONCEPTS, SEEING HOME AS A NODE

SEEING RESIDENTS AS AGENTS RATHER THAN "END-USERS"

Figure 11. Key findings in relation to key areas of discussion

and subsequently how different professional disciplines and sectors interact with each other as socio-technical, ideological, and demographic shifts pose new demands. This further links to a second area of discussion, and the role of the people who inhabit what is built. By exploring a different way of approaching agency in and of the home through the metaphor of the node, residents are acknowledged as active agents rather than "end-users" or consumers.

Both perspectives have developed during the course of the PhD work, allowing for a discussion of the contribution of this thesis as part of a growing body of research questioning a previously dominant techno-focus in building research. As a whole, the thesis makes a case for the need to rethink how we live and how we conceptualize homes in relation to transitions to a low-impact society—reconceptualizing what a sustainable home could be. This includes perceptions of a good home, linking to questions of standards, comfort, and convenience, where and with whom we live, and also what we do in the home and how the very concept and boundaries (both cognitive and physical) of home can evolve with and through new practices and household configurations. From this perspective, a main argument made in this thesis is that we cannot simply adjust our residential buildings or the people who inhabit them to new technology within essentially the same structures.

While the thesis does not propose direct "ready-to-use" recommendations for planners and legislators, it opens the door for other actors and ways of approaching sustainability in housing. The contribution of the work is the broad diversity of narratives surrounding a sustainable home that emerges. It challenges suboptimal technical solutions, but also calls into question alternative developments towards compact urban living, for example, that might simply "outsource" the environmental and social impact to other sectors or geographical areas.

The implications for architectural practice are associated with reassessing the processes

and power relations implied in contemporary housing development. Going from seeing housing as an object to a node, or from a consumer commodity to enabling certain ways of life, also suggests reframing residential architecture and the role of the architect. By combining knowledge on residential quality, a people-centered design perspective, and objectives to radically reduce the resource and energy intensity of new (and existing) residential environments, the thesis emphasizes the potential for architects to actively contribute in co-producing alternative imageries. However, both practice and research will need to critically address the reproduction of norms and socio-economic structures within professional conventions.

The issues raised in this thesis also respond to a gap in research development and to the lack of a contemporary equivalent to the once-strong Swedish research tradition on housing, in which extensive empirical studies provided a basis for the establishment of building regulations as well as social norms and perceptions of the good home. An updated revision and expansion of more interactive research on how people actually use their homes, and to what end, is particularly relevant in light of new societal challenges and new citizen groups (Nylander & Braide Eriksson, 2009). There is a need for testing and exploring new ways of residing, further positioning home in the transformations of society and environments in the twenty-first century. Being able to visualize ideals and various conflicting conceptualizations of home, and the resource implications of these, is an important part of advancing the discourse on sustainability in housing. Here design research could play a part in investigating new narratives, imagery, and design/build processes, contrasting conventional housing research but also going beyond a "preference-based" market understanding of trends.

7.2. REFLECTION AND FUTURE RESEARCH

As emphasized throughout this thesis, conceptualizing sustainable homes demands a research perspective that tries to bridge simplified dichotomies, such as that posed between building performance and use. Since the start of this PhD work, things have started to change in this regard, and there is now a lot more research emphasizing the need to connect to what people do and how they live within buildings. The role of architectural knowledge, in what might previously have been a rather techno-centric research field on sustainable building, particularly revolves around providing a complementary understanding of

interlinked socio-spatial relations. This must also incorporate greater sensitivity to how we give meaning to our residential environments and the practices that are enabled in them.

This thesis has sought an integrative understanding, yet has done so from the limited background of architectural research, building further on multiple other fields and research topics in an attempt to approach sustainability in a potentially more fundamental way. This connects several scales and scholarly disciplines, from cognitive processes (values, habits, beliefs) to social interactions (social norms, the household as unit and crucible), technological and material development (socio-technical systems), the built environment (planning, human geography, architectural history), and even potential new societal systems (transition movement, degrowth). This kind of linking between levels and between different schools of thought and research traditions is by no means a small task and definitely not one that is solved in this thesis, yet it appears to be one of the primary tasks for future research concerned with finding trajectories towards sustainability.

Working between or even transcending disciplinary understandings is challenging, yet can at the same time be incredibly rewarding, and is a principle takeaway from the research environments of which this thesis has been a part. Further work to create platforms for tackling the issues raised here will certainly be needed, bringing together different actors not only in re- or co-producing understandings, but highlighting conflicting perspectives. Initiatives are occurring, but to some extent they still lack truly crosscutting forums, perhaps further underlining the inherently political and often polemical nature of questions surrounding housing and resource use. Positioning the sustainable home calls for a reassessment of the emotive and societal values home fulfills in exploring constructs surrounding home in relation to absolute limitations of ecological boundaries.

The perspectives raised here are not easily formulated into clearly delimited future research questions. However, this thesis does provide a potentially different starting point than current perspectives on the preferences and ideals of the modern home, and will be relevant to tackle in future research and practice. How can negotiations between living standards, qualities, and functions be resolved in different ways, and how can architects (or other actors) in turn negotiate between roles such as that of facilitator, visionary, or rational consultant? A changed framework for working and a shift in frame of mind might bring a potential for new types of actors and new forms of collaboration between actors, not least residents as active agents themselves, in conceptualizing sustainable homes.

Research will need to continue to bring together, contrast, and discuss aspects of resource demand and spatial or material norms, as well as explore implications for policy. The potential of people, as citizens and residents with agency, to interpret, influence, and shape the sustainability discourse needs to be discussed further. This includes studying prerequisites for development initiatives, for example with regards to financing systems, the role of public housing companies and other community entities, questions regarding access to land, building regulations, and planning of infrastructure and services.

A more explicitly feminist approach has not been pursued here, yet particularly discussions formulated towards the end of the PhD work have raised questions of the potential to further explore sustainable homes from a feminist understanding of the everyday, and reconceptualizations of home as a node for potentially fundamental transformations of society. Beyond assumptions of global theories or systems, this draws upon Haraway (1988) and Gibson-Graham (2008; 2014) in considering situated knowledge among diverse groups—women as well as non-western "others"—in the mediation of home and home-making. Traditionalist notions of gendered spaces, practices, meanings, and household tasks (Darke, 1994) could be further challenged from the perspective of ongoing engagements with local and societal transitions (Astyk, 2013).

A feminist critique of sustainable urban development discourse has raised perspectives to scrutinize further, including alternative, utopian, and experimental spatial possibilities (Schalk, Gunnarsson-Östling & Bradley, 2016). Feminist perspectives on home and architecture also question norms related to gender and sexuality (Bonnevier, 2007). A research agenda for the housing sector should problematize representations and understandings in interpretations and operationalizations of sustainability. Further study of how various low-impact home practices might or might not be gendered (for example co-housing in relation to eco-efficient domestic technology), and the impact this has on narratives of sustainable housing, would be a relevant addition to ongoing debates in adjacent fields as eco-feminism and political ecology.

Overall, building upon an understanding of contextualized and diverse narratives, changing conditions for housing will need to consider overt (and possibly covert) power relations. Both research and practice will have to deal with and critically reflect upon how different groups are affected and/or enabled through their homes in order to build capacity for people to create multiple routes of action towards a low-impact society.

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APPENDIX

APPENDIX A: INTERVIEW GUIDE - STUDY 1

1. ABOUT THE COMPANY

1.1. Type of company

-Which type best describes your company?

-How many dwellings do you build/sell/rent every year?

-What kind of housing do you mainly build/sell/rent?

1.2. Market area

-What is the geographical market area you work within?

-What is the general interest in innovation within the market you work with?

1.3. Standards and concepts offered

-Do you have any special concept for the new dwellings you build?

-What are your standards for new housing regarding size, materials, equipment, and common facilities?

-To what degree do you consider environmental and sustainability issues when defining these standards?

-How have they changed over time?

-How do you think these standards will evolve in the future?

-In the case of Kvillebäcken, were any standards imposed by the city?

2. INNOVATION IN THE STANDARDS AND CONCEPTS OFFERED

2.1. Innovation policy of the company

-Do you have a company policy concerning innovation in the standards and concepts offered?

-Are you interested in innovations that… make the houses you build more affordable? More comfortable? Supporting sustainable living?

-Is there something written in your business plan regarding innovation?

-Is your company encouraging individual initiatives and ideas concerning innovation in the standards and concepts offered?

2.2. Innovation decision maker

-How many people within the company would you say work with standards and innovation? Do they constitute their own department (which one)?

-Who within the company decides on the introduction of an innovation in the

standards and concepts offered?

- What is your precise role in the organization?

2.3. The introduction of innovation process

-What is the process for implementing a new innovation within the company? Do you have to convince partners or investors when you want to innovate?

- How long does it take to implement a new standard or concept?

- How do you introduce or communicate innovations?

3. DRIVERS OF INNOVATION AND CHANGES IN CONCEPTS OFFERED

3.1. Trends and market - consumers

-What are your sources of information and how do you gather this (observing market trends, consumer surveys)?

3.2. Laws, regulations and policy

-What influence does laws and regulations, the objectives of planners - local or national policy - have on changes in standards?

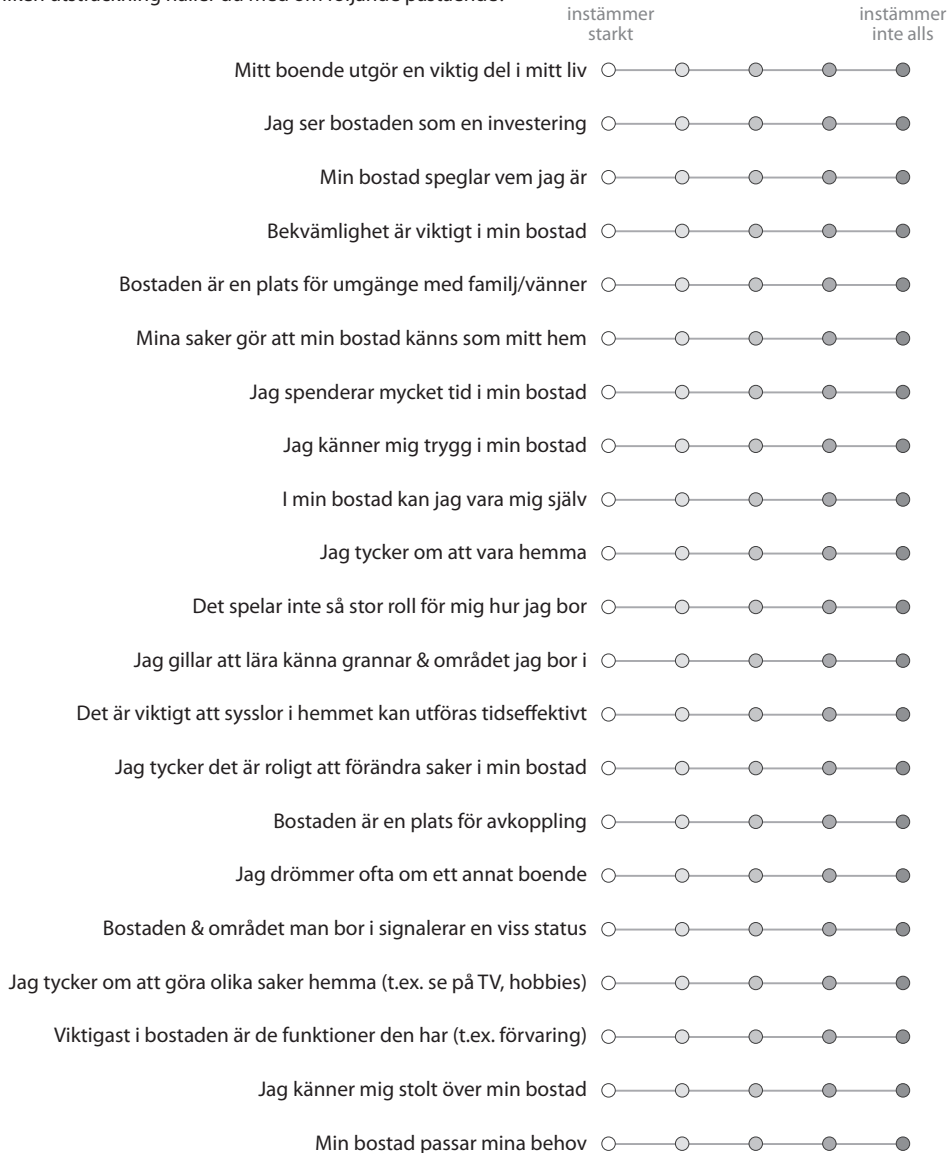3.3. Alternatives proposed by the company itself

-Is the company implementing own ideas/alternatives, outside the mainstream?

3.4. Conclusion

-Which of the drivers would you say is/are the most important to consider, regarding innovation within your company?

APPENDIX B: QUESTIONNAIRE SECTION ON HOME - STUDY 2

I vilken utsträckning håller du med om följande påstående?

instämmer starkt ... instämmer inte alls

Mitt boende utgör en viktig del i mitt liv

Jag ser bostaden som en investering

Min bostad speglar vem jag är

Bekvämlighet är viktigt i min bostad

Bostaden är en plats för umgänge med familj/vänner

Mina saker gör att min bostad känns som mitt hem

Jag spenderar mycket tid i min bostad

Jag känner mig trygg i min bostad

I min bostad kan jag vara mig själv

Jag tycker om att vara hemma

Det spelar inte så stor roll för mig hur jag bor

Jag gillar att lära känna grannar & området jag bor i

Det är viktigt att sysslor i hemmet kan utföras tidseffektivt

Jag tycker det är roligt att förändra saker i min bostad

Bostaden är en plats för avkoppling

Jag drömmer ofta om ett annat boende

Bostaden & området man bor i signalerar en viss status

Jag tycker om att göra olika saker hemma (t.ex. se på TV, hobbies)

Viktigast i bostaden är de funktioner den har (t.ex. förvaring)

Jag känner mig stolt över min bostad

Min bostad passar mina behov

APPENDIX C: INTERVIEW GUIDE - STUDY 2

1. DEL ETT

1.1. Hur bodde du när du växte upp?

1.2. Kan du säga något mer om hur du har bott tidigare?

    -På vilka sätt? Med vilka?

1.3. Vilken typ av boendemiljö trivs du bäst i? (t.ex stadsmiljö, villaområde)

1.4. Varför tror du att du trivs i den typen av boendemiljö?

1.5. Hur länge har du bott där du bor nu?

1.6. Vad tycker du om att bo där du bor nu?

1.7. Hur skulle du vilja bo om du inte bodde så du bor nu?

1.8. Vad i din livssituation tror du skulle kunna förändra hur du vill bo?

1.9. Hur tror du att du skulle vilja bo om 10-30 år?

1.10. Vad är ett (bra) hem för dig?

2. DEL TVÅ

2.1. Vad skulle du säga är standarden/skicket på din nuvarande bostad?

2.2. Hur väl skulle du säga att din nuvarande bostad passar dina behov?

2.3. Om du fick välja, är det något du skulle vilja göra om? Varför?

2.4. Tror du att du skulle kunna utnyttja din bostad annorlunda?

2.5. Skulle du kunna tänka dig att bo mindre (för att spara resurser)?

    -Hur litet skulle vara minimum för att du skulle känna att din bostad
    ändå uppfyllde dina behov? (yta/antal rum?)

2.6. Skulle du kunna tänka dig att bo tillsammans med andra (för att spara resurser)?

    -Vad tror du skulle krävas av boendet för att kunna bo så?

2.7. Hur villig skulle du vara att bo "mindre bekvämt" för att spara resurser?

    -t.ex ha det kallare inomhus,

    -ha mindre saker,

    -eller enklare standard (ytskikt etcetera)

2.8. Skulle du kunna tänka dig göra någon/några av de aktiviteter som du gör i hemmet idag utanför din bostad?

    -Vad skulle krävas för att du skulle vilja/kunna göra detta?

3. DEL TRE

3.1. Hur skulle du säga att bostadsutvecklingen i Sverige ser ut idag?

-Ser du några problem? Vad skulle du i så fall säga är de största problemen?

3.2. Vad tror du påverkar vad som byggs idag?

-Byggföretagen själva – de som bygger på bostadsmarknaden idag ?

-Lagstiftning – nationellt och kommunala regler?

-De boende själva?

3.3. Skulle du säga att du är mer miljömedveten än andra i din bekantskapskrets?

3.4. Skulle du säga att du är intresserad av att bo mer miljövänligt?

-Vad tror du skulle krävas av en boendemiljö för att kunna leva (mer) miljövänligt?

3.5. Har du kommit i kontakt med några hus/bostadsområden som marknadsförs som miljövänliga?

-Vad tycker du om denna typ av hus/bostadsområden?

-Är denna typ av hus/bostadsområden något för dig?

3.6. Skulle du kunna tänka dig att betala mer för att bo mer miljövänligt?

3.7. Vad tycker du om en "grön" bostadsutveckling i stort?

-Tycker du att det är viktigt med ett mer miljövänligt bostadsbyggande?

-Upplever du att det görs tillräckligt?

-Ser du några problem? Vad skulle du i så fall säga du tror är de största problemen?

3.8. Vad tror du påverkar om det byggs mer miljövänligt?

-Byggföretagen

-Lagstiftning

-De boende

APPENDIX D: INTERVIEW GUIDE - STUDY 3

1. DEL ETT

1.1. Hur bodde du när du växte upp?

1.2. Kan du säga något mer om hur du har bott tidigare? (På vilka sätt? Med vilka?)

1.3. Vilken typ av boendemiljö trivs du bäst i? (T.ex stadsmiljö, villaområde)

1.4. Varför tror du att du trivs i den typen av boendemiljö?

2. DEL TVÅ

2.1. Hushållet: hur skulle du definiera ett hushåll? (Hur ser ditt/ert hushåll ut?)

2.2. Huset/byggnaden: Hur skulle du beskriva din/er bostad?

2.3. Hur länge har du bott där/så som du bor nu?

2.4. Hur resonerade du innan du valde att bosätta dig här/på det här sättet?

2.5. Vad skulle du säga var största drivkraften?

2.6. Vad ser du för implikationer av att du valt att bo på detta sätt, kortsiktigt/långsiktigt?

2.7. Hur upplever du att det är att bo så som du gör?

    -Vad skulle du säga att du gillar mest med att bo på det sätt du bor?

    -Vad skulle du säga är sämst med ditt nuvarande boende?

2.8. Hur upplever du att andra ser på denna typ av boende/hur du bor?

    -Bland vänner/familj?

    -Bland grannar/andra invånare i kommunen?

2.10. Upplever du att du genom att bo så här har ett lägre fotavtryck/mindre resurspåverkan än om du hade bott enligt "normen"?

2.11. Vilka förutsättningar upplever du finns för att kunna bo och leva på det sätt du gör?

    -Socialt/organisatoriskt

    -Fysiskt/infrastruktur

3. DEL TRE

3.1. Hur skulle du vilja bo om du inte bodde så du bor nu?

3.2. Vad i din livssituation tror du skulle kunna förändra hur du vill bo?

3.3. Hur tror du att du skulle vilja bo om 10-30 år?

3.4. Vad skulle du säga är ett (bra) hem för dig?

3.5. Hur viktigt är det för dig hur du bor?