Self-build homes come in all shapes and sizes and are driven by a variety of intentions. Different budgets, environments and regulations shape them. I am particularly interested in those who self-build homes based on ecological principles and within a small budget – affordable eco-homes (Pickerill, 2016). These homes are especially interesting because eco-housing is often inaccurately assumed to cost more to build than conventional homes, and although cheaply assembled eco-homes have long existed, they are little understood and too often marginalised as ‘quirky’ and idiosyncratic outliers (Pickerill and Maxey, 2009) (for example, Figure 4.1). In fact, the intellectual and political marginalisation of these houses exemplifies exactly why the socio-cultural is so important in understanding self-build homes and their potential.

Encouraging more eco-homes remains a difficult task hindered by risk adversity, lack of knowledge and skills, reliance on technological fixes, infrastructure issues and certain expectations of comfort and convenience. While Roaf et al. (2007) argue that ‘architects who cannot incorporate energy and water conservation, reuse and renewable energy into their buildings will become dinosaurs, as will their white elephant buildings’ (Roaf et al., 2007, 318), environmentally damaging practices are continuing and waste is still rife in the house construction industries. We need to do better. In part, the lack of progress is a result of many government policy agendas that prioritise technological approaches to eco-housing, a highly competitive land market economy and conservative construction industries. For example, in Britain eco-housing is reduced to a checklist of objects that is resisted by developers and builders (Osmani
and O’Reilly, 2009) and is unlikely to be as effective as hoped (McManus et al., 2010).

Indeed, the construction of eco-houses has been slow and they remain a marginal component of housing markets in countries such as England, the USA and Australia (Chambers, 2011). If the technology and knowledge are already available and yet there is still resistance to eco-housing, then it would seem appropriate to suggest that other issues are hindering its growth. While there are clear economic, political and land barriers to the growth of self-build in Britain, many of which are well known, here I focus on the understudied socio-cultural processes. This requires examining not just which socio-cultural factors are implicated in self-build, but in particular how these socio-cultural processes are relevant to understanding self-build eco-homes.

It is timely, then, to learn from self-build eco-homes, which often focus less on technological solutions and instead embody a more holistic approach to the environment and the social. It is only through analysis of the socio-cultural dimensions of eco-homes and their agency that homes can be designed and built which are suitable for the local environmental context, social needs and economic conditions of a place. By examining these homes and their associated social practices and processes, it is possible to identify what enabled them to be built and therefore how the construction of more eco-homes (of all varieties) could be further encouraged.

**Methodology**

The empirical material on which this work is based has been collected since 2006, with most material collected during a six-month period in 2010, and the most recent data collection undertaken over three months in 2016. In all, 18 eco-homes or eco-communities were visited across England, Scotland and Wales. These are identified in the text where possible, although some communities wished to remain anonymous. The criteria for case study selection were that: (a) eco-homes were ecological; (b) the houses were self-built; and (c) houses were affordable and did not cost more than 35 per cent of household income. The majority of cases were new-build constructions rather than renovations. The focus on new build was chosen because it tended to offer more affordable housing (in that eco-retrofitting is unfortunately quite costly) and it was easier for new builds to reach a high ecological standard, whereas retrofits were often limited in the eco-features that they could install.
Participation in the case studies was sought, though the extent of involvement varied significantly between them. When possible, I joined activities on-site such as building, gardening, scything, cooking and eating communally, engaging with group meetings, socialising and staying on-site for several days and up to two weeks. For each case study, in-depth face-to-face interviews were conducted, photographs taken, field diary observations made, and sketches of the site were recorded. At several sites it was also possible to access archival material. A total of 38 interviews were conducted, with most interviews lasting at least an hour, and several lasting over two hours. All interviewees gave written consent and were able to withdraw at any time. If requested, anonymity was given to interviewees as well as case study locations.

**Defining eco-homes**

Eco-homes are a product of the social, economic, geographical and political environments in which they are built. While the intended functions of an eco-house are often quite simple, they are only achieved through complex interactions between different forms, approaches, technologies and occupants. Ecological architecture calls for an understanding of the
peculiarities of place, materials, cultural context, climate, solar and wind patterns, people’s lifestyles and needs, and existing biodiversity. This can then all be used to design a house that requires far less energy both to build and to run. Most importantly, it is the interconnectedness of these features that requires attention and understanding (Wines, 2000); ‘buildings are part of a complex interaction between people, the buildings themselves, the climate and the environment’ (Roaf et al., 2007, 24). In response to the plethora of factors that need to be taken into consideration, there are a multitude of types and forms of eco-houses. The term can include zero- or low-carbon houses, low-impact developments, sustainable housing, green building, passive houses (*passivhaus*), zero-net energy housing and energy-plus houses (see, for example, Roaf et al., 2007; Williams, 2012; Broome, 2008). This diversity has complicated attempts to define what an eco-building is and what it does.

Eco-housing is best understood by distinguishing between the function and the form of a building. The function refers to the intended outcome of a design choice, whereas the form refers to the process by which that function is to be achieved. Thus, the forms of eco-housing vary enormously and include using highly technological systems or low-tech vernacular natural-build approaches to achieve the same function of low-carbon housing. Although highly entwined, the function does not always determine the form of eco-housing. Instead, there is a continuous evolution of architectural and building practices aiming to improve the ability of different forms of houses to achieve these functions, resulting, for example, in a broad range of forms of eco-houses.

As the form of eco-housing is different from its function, it is possible to identify certain commonalities characterising eco-houses, without implying how they might be realised. This openness to diversity is important because there is no agreement on the perfect way to build an eco-house. Indeed, ‘sustainable construction strikes a balance between the potentially conflicting demands of the use of energy, other resources and ecology’ (Broome, 2008, 18) and these demands result in diverse building approaches. The common functions of an eco-house are that a building, across its whole life cycle, should: (a) minimise resource use (in materials, in embodied energy, energy requirements, water use); (b) minimise waste (in materials, space, energy, leakage); (c) maximise use of renewable energy (such as solar, wind, water); and (d) maximise use of renewable materials (such as straw, sheep’s wool, wood, earth).

This separation between function and form also helps explain some of the problems encountered by ecological architecture: a focus on function can limit eco-houses ‘to checklists of moral responsibility
and remedial action’ (Wines, 2000, 68), deflecting from a broader focus on aesthetics or a concern with developing new ways of connecting eco-housing to its cultural and natural context (Lombardi et al., 2011). However, a focus on materials and aesthetics can preclude adequate consideration of required building performance in terms of durability, comfort and energy supply.

As such, there is no single, perfectly efficient, functioning eco-house; instead, eco-houses are a relative progression towards reducing waste. Different houses deal with waste issues differently and this leads to a broad variety of eco-houses. As a result, eco-houses are more heterogeneous than they are similar, and this hybridity in form can complicate their promotion (Guy and Osborn, 2001). Understanding eco-houses as an interrelation between function and form enables a clearer understanding of this diversity and of how form can override function, or function override form. As one member of the Newark retrofit project explained:

To be honest, we didn’t give too much thought to aesthetics. It was more function over form. It was really this is what we need to do to make it perform … we weren’t really striving for aesthetics; we were striving for performance. (Male interviewee, Newark)

Eco-houses are being built to deal with the issues of waste through a range of approaches, including: structural innovations; size alterations; harnessing renewable technologies; retrofitting existing housing stock and changing occupant behaviour and practices. Each approach has benefits, limitations and financial costs. Ultimately, eco-building is the negotiation of a set of dilemmas where different logics influence the final outcome of an eco-house (Guy and Osborn, 2001).

**A socio-cultural analysis of eco-homes**

Although the policy, economic and land-availability issues that have tended to hinder self-build eco-housing have received attention by scholars and policymakers in efforts to encourage more eco-building, little attention has been paid to socio-cultural influences. This is a mistake; for example, much of the resistance to eco-housing can be understood, and therefore tackled, through analysis of the social issues that it raises. The knowledge, capacity and technology to build eco-houses already exist. Yet relatively few eco-homes are being built and often expensive technology, rather than simple design, is relied upon to make a house more
ecologically friendly: ‘one of the major problems facing environmental architecture, aside from the absence of a strong societal endorsement, is a professional choice to over-emphasize the technological advantages and undervalue the social and aesthetic aspects’ (Wines, 2000, 64).

This emphasis on technology as the best way to achieve environmental measures in new housing is problematic. Technology alone cannot create eco-houses, in large part because their performance is reliant upon residents’ compliance. Perhaps the best example of this is the use of manual heat exchange systems that are misused by residents opening too many windows. But occupants of eco-buildings also need to be able to ‘forgive’ less-than-ideal conditions at certain times; in other words, they need to work with a building rather than expect uniform functionality (Deuble and de Dear, 2012). This is not to suggest that eco-housing does not benefit from technologies; many, like micro-generation renewable energy systems, are central to reducing reliance on fossil fuels. Rather, it is the total reliance upon technologies and the technology-first approach that ignores the influence of the socio-cultural factors that limits eco-housing construction.

A socio-cultural approach reveals the complex meanings of conventional homes and thus the potentially radical challenges to residents’ values and practices that eco-housing proposes (Reid and Houston, 2013). For example, houses made of straw bales limit what can be easily hung on internal walls; eco-houses might require more manual effort to manage heating and ventilation (not necessarily offering automated internal temperatures), and might limit excessive use of water such as using hose-pipes for washing cars or drives. These examples suggest just a few ways in which eco-housing might require social changes in how people live, and thus why people might resist them. At the same time, the changes required are often exaggerated through myths and assumptions furthering anxiety about eco-housing. All in all, it is not technology, or even politics, that is holding society back from adopting eco-housing; it is deep-rooted cultural and social understandings of how we live and what we expect houses to do for us.

This social perspective on eco-housing is indebted to, and builds upon, critical architecture approaches and architectural geographies. In recent years, geographers such as Lees (2001), Kraftl (2006) and Jacobs and Merriman (2011) have called for architecture to be understood as spaces of ‘ongoing social practices through which space is continually shaped and inhabited’ (Lees, 2001, 51). Architecture is more than a representation; it is a lived, evolving space that is shaped (and made meaningful) through the everyday practices of those using it. Similarly,
Guy (2010) argues for the need to take a social and cultural approach to sustainable architecture in order to understand its hybrid, fluid diversity and to open up the possibilities of both what sustainable architecture is and what it could be.

This socio-cultural approach requires analysis of the social practices and processes that inform house design and use, the chosen aesthetics and how they fit or contrast with their surrounds, people’s perceptions of homes, how people use or misuse their homes, and the psychological desires people attach to a home. During the research, it became clear that several developers, builders and architects focused on the technological functionality of eco-houses to the detriment of considering the aesthetics, usability and desirability of homes. Greater consideration therefore needs to be given to four socio-cultural elements when understanding self-built eco-homes and when encouraging further eco-building: (1) align eco-home designs with the socio-cultural desires in a home – a space of social relations filled with emotions, traditions and politics; (2) accept that human agency is central in the functioning of an eco-home and eco-homes’ functioning relies upon compliant occupants; (3) embed eco-homes into places, paying attention to what already exists in a place; and (4) reconfigure some elements of comfort to be more ecologically benign. Each of these will now be explored in turn.

**Align with the socio-cultural desires in a home**

Eco-homes will only be adopted if they offer what people demand from a home and allow people to live how they want to within them (NHBC Foundation, 2012). While acknowledging a huge diversity in what people demand of and desire in a home, there were some common features, shown in Table 4.1. Despite this table being dominated by quantifiable features such as location, size, affordability and green space, much of what is desired in a home is qualitative and subjective. Emotions, such as feelings about the aesthetics, light and the comfort of a house, are often crucial in house choice; indeed, ‘emotional considerations can overrule practical considerations when people are choosing their new home’ (Finlay et al., 2012, 5). Owning a house and home is linked to improved well-being and health, where residents enjoy the practical and emotional benefits of home-owning (Searle et al., 2009). These emotional gains can outweigh the benefits of the potential financial investments of home-owning, and such financial benefits are often of secondary importance. It is vital to
understand the contribution of this mixture of social meaning and material attributes in house choices (Papenek, 1995). The importance of these different criteria for home, and the number of socio-cultural factors included in Table 4.1, need to be taken more into account in eco-home designs.

What is demanded of and desired in a home is of course contingent on the variables of people, place and politics. Different people will attach different meanings to homes and houses and have diverse requirements of them. As Heathcote (2012) notes, despite radical changes in societies, gender relations, employment, technology and quality of life factors, houses in Britain, the USA and Australia have changed relatively little. Many of the feelings about home and desires in a house are a quest for continuity. This quest for continuity is represented in the nostalgia for certain forms of house architecture that are recreated in contemporary dwellings. As an English building constructor argued, ‘the punters want what they have always done … they want a nice-looking house, at the right price, in a decent area and I can’t see that changing anytime soon’. While some social practices can be altered over time, as discussed further below, other desires are harder to change and need to be accommodated. The needs in a house and home do, however, change as people age (Day, 1990) and as circumstances change. As Imrie notes, bodily form changes with age, and many of us are likely to suffer a form of bodily impairment that will impact our understanding of and needs in a home (Imrie, 2003, 2004).

Addressing privacy

The tension around a desire for privacy is a good example here. Privacy is for many a key purpose of a house, albeit culturally contingent. In Britain, there is a desire and need for privacy, both from external others and internally from others in the household. Externally, this privacy is created through high garden fences, window screens (once net curtains, increasingly permanent opaque windows) and individual front doors. Internally, however, the shift towards more open-plan living since the 1950s (in response to demands for more space and light when high land costs meant building plots were smaller) has created greater shared and communal space for family living. Privacy then becomes negotiated between partners, children and household tasks, where women in particular crave privacy but struggle to find it (Munro and Madigan, 2006); ‘private space within the home made an important contribution to participants' well-being and was important to participants of all ages’ (Finlay et al., 2012, 4). This British need for individual privacy is less prominent in
Japan, for example, where family-centred privacy is sought rather than individual space (Ozaki, 2002).

The need to share space and therefore have less private space is perhaps the best example of how homes are being redesigned to be more ecological. In terms of housing, there is a need ‘to find ways to meet people’s privacy needs while keeping our home sites compact and not sprawled

Table 4.1 Common features and criteria that people demand and desire in a home

<table>
<thead>
<tr>
<th>Feature</th>
<th>Explanation</th>
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<tbody>
<tr>
<td>Adaptable</td>
<td>Flexible in function and in response to future changing needs, especially a large main space for eating, relaxing and entertaining.</td>
</tr>
<tr>
<td>Affordable</td>
<td>They can attain a mortgage to buy the house or can afford it outright.</td>
</tr>
<tr>
<td>Beautiful</td>
<td>Aesthetically pleasing looks, period features, how a place looks and feels.</td>
</tr>
<tr>
<td>Comfortable</td>
<td>Comfortable, stable thermal temperature and offering convenient facilities (water, bathrooms, heat, refrigeration).</td>
</tr>
<tr>
<td>Convenient</td>
<td>Ease-of-use of, for example, built-in technologies, windows, layout.</td>
</tr>
<tr>
<td>Durable</td>
<td>A home that is long-lasting, high quality of construction and finish.</td>
</tr>
<tr>
<td>Green space</td>
<td>Close to parks and green open spaces and/or with its own garden.</td>
</tr>
<tr>
<td>Investment</td>
<td>The likelihood that a financial gain will be made.</td>
</tr>
<tr>
<td>Light</td>
<td>Natural light through large windows.</td>
</tr>
<tr>
<td>Location</td>
<td>Close to family and friends, good access to schools, healthcare, transport links and shops.</td>
</tr>
<tr>
<td>Maintainable</td>
<td>Easy to maintain, does not require regular or expensive maintenance.</td>
</tr>
<tr>
<td>Private</td>
<td>Privacy is important both through separation from external others and the provision of private spaces within a home for residents to be alone.</td>
</tr>
<tr>
<td>Quiet</td>
<td>Low noise pollution.</td>
</tr>
<tr>
<td>Secure</td>
<td>Secure physically and financially, area with a low level of crime.</td>
</tr>
<tr>
<td>Spacious</td>
<td>Enough room for all occupants and their different functions, good room sizes.</td>
</tr>
</tbody>
</table>
all over the landscape.4 The tendency to seek to hide from others to create privacy through buildings scattered apart increases environmental destruction and infrastructure costs (Leafe Christian, 2003). Not only have very small eco-houses been built, but many eco-house approaches advocate sharing homes with those beyond family (Jarvis, 2013). Sharing home space takes multiple forms – co-housing provides shared communal areas and private individual dwellings, while some eco-communities share a whole house. Co-housing ‘combines the autonomy of private dwellings with the advantages of community living’ (Williams, 2005, 200), or, as Sullivan-Catlin (2004) argues, co-housing could also be conceived of as ‘a cooperative neighbourhood’. The co-housing model is proving popular because it enables a balance between privacy and sharing (Lietaert, 2010). Ideally, interaction is encouraged by ensuring that front doors face each other, while privacy is created for living rooms and through careful window placement (Leafe Christian, 2003) (Figure 4.2a & b). Sharing enables fewer resources to be used, while a good quality of life is maintained (see Hudson; Fernández Aggiroitia and Scanlon, this volume). It can involve sharing food production, sharing garden and DIY equipment, and car clubs (McCloud, 2011). Many eco-communities deliberately reduce privacy and instead encourage more communal and collective activities, such as eating together; ‘there is a loose, inverse relationship between the degree of communalism and privacy’ (Metcalf, 2004, 102).

Whatever the approach, however, sharing home space requires rewriting domestic norms and creating new rules of intimacy (Procupez, 2008). Litfin (2014) uses the term ‘ratcheting’ to describe the numerous spontaneous interactions of living in close proximity. As people move around and through the eco-community, they have many random encounters with others. People often need a balance between contact and solitude. Sharing space and time creates and tests new forms of sociality and engagement with others (Jarvis, 2011). In many eco-communities, like the Lancaster Co-housing and the Threshold Centre (LILAC), residents have navigated this tension between privacy and communality by adopting props (wearing a hat or hanging a scarf on a door is used to signal a need for privacy) and adjusting how they walk through a community depending on whether they feel sociable or not:

People understand and respect if you want to just do a hello or good morning and then walk on. Otherwise it can take half an hour to get to the laundry and back, depending on your character … as a group of members we’ve got better at that, but still some people dive in straightaway with a big question. … I think we’re quite respectful of
each other’s time. There’s a whole spectrum of how sociable, convivial people generally ought to be … if you put your head down and just walk somewhere, then people will respect that and read the body language. (Male interviewee, LILAC)

However, the design of some of the homes – with large windows and doors facing a central community space or walkway – have led some residents to adjust the internal layout of their property to reduce being overlooked. For example, in Lancaster Co-Housing, some residents have inverted the order of their internal space to position their kitchen and living space away from view. For some, these processes might be easy to adopt, but for others the shift from the individualised family-centred culture of home to a more open, fluid and shared home space requires negotiation, learning new practices or some redesign.

**Human agency is central**

Human agency is central to the functioning of an eco-home, and eco-homes’ functioning is reliant upon compliant occupants. Occupants’ practices can undermine the efficiency of an eco-home and eco-homes are as much a social as a technological challenge (Cole et al., 2010). However, human agency is not fully understood (Cole et al., 2010; Stenberg et al., 2009). There are a couple of salient examples worth exploring here. First, recent research has identified increased overall use of electricity in eco-homes because residents perceived the energy to come from ecological sources (Pilkington et al., 2011). However, such additional use of energy, whatever its source, is problematic because it still uses resources (which could be used elsewhere) and the feeling of abundance could easily influence residents’ practices elsewhere. Minimising waste in housing might have a positive influence on daily practices in other areas of residents’ lives and in those organisations or stakeholders involved in the construction. Fry and Sharma (2013) refer to this as the ‘generativity’ of eco-building that can lead to a greater capacity for environmental responsibility *per se*.

Second, residents have the ability to undo the effectiveness of technologies and design in their home. In the case of the Newark retrofit project, the house functions were reliant upon householders not opening the windows in winter. As a member of the project explained, the mechanical heat ventilation system and the gains from passive solar heating could easily be undone:
the resident needs to understand the design principles and that in winter you don’t open these [windows] … because this house might lose lots of energy … if someone’s opening windows all the time, then it’s going to get a lot colder. The Council have said to us some of their tenants they’re at home all day sitting on the sofa watching telly, smoking with the windows open … It’s about not opening windows. (Male interviewee, Newark)
Similar problems were found by Rohracher and Ornetzeder (2002), who discovered a key inefficiency in ecological apartment buildings in Austria was residents opening windows. In eco-houses that employ technologies there is also a need for user-friendly control interfaces. Poor and confusing design and lack of occupant understanding of the systems installed have led to inefficiencies in the functionality of eco-houses (Stevenson et al., 2013). It is not just that some user control interfaces are difficult to understand, but that if eco-houses and their technologies were better designed they could act as forms of feedback to the residents that could begin to help train new behaviours and practices. For example, in a US prototype, a light display in the kitchen backsplash brightens and dims according to resource use – a potentially simple feedback to household use that is likely to have more impact than the more common data monitors.

This emphasis on understanding the two-way dynamic interaction between residents and buildings (that individuals shape buildings, and buildings shape individuals) is a productive way of acknowledging the centrality of people to eco-house functionality. As Cole et al., argue ‘buildings do not consume energy; inhabitants do through the medium of architecture’ (Cole et al., 2010, 340). This is not to say, however, that changes in human practices alone can necessarily dramatically alter environmental impact; ‘it is incredible to note that in many parts of the world including Britain, the challenges of trying to reduce the catastrophic impacts of buildings on the environment are still left to individuals’ (Roaf et al., 2007, 21). Rather, it is in the interrelationships between broader social and economic processes and the household that eco-homes are likely to be most effective (Gibson et al., 2011; Allon and Sofoulis, 2006).

Eco-homes and resident interaction

Achieving the effective functioning of eco-homes requires attending to human behaviour, practices, habits and needs (Butler, 2004). To some extent, houses have to be designed and built to suit occupants’ needs; ‘the eco-house becomes a working machine in which lifestyles have to be considered carefully and matched with the supply systems built into the house’ (Smith, 2007, 96). However, reducing waste is as much about changing daily practices as it is about using new technologies (Shove, 2003). In conventional houses residents are locked into practices by habit and infrastructures. Eco-homes are an opportunity to change daily energy use by, for example, preventing high water use in baths (by only having showering facilities) or encouraging water conservation (by installing a
water meter) (Heiskanen et al., 2010). In this way, eco-house building is a balance between residents’ needs and lifestyles that are more environmentally sustainable. Crucially, eco-homes need to be designed in ways that humans can easily operate and not easily disrupt.

A good example of this are off-grid homes, where residents have to live according to the available electricity and water that they can generate and collect. At Green Hills in Scotland, living off-grid has required them to build their entire power, water and waste infrastructure themselves (Figure 4.3). As a result, they have had to make choices about which systems are feasible and which are not, and then adjust their daily practices accordingly. While they generate enough electricity through photovoltaic panels and a small wind turbine to support internal lighting and sockets to charge electronic devices, there is not enough electricity to power a fridge. They have piped rainwater to their sinks, but drinking water has to be manually collected from a stream. Their toilets are compost toilets located a short walk from their house. These small but notable differences from conventional houses are difficult to disrupt and therefore the residents adjust – by conserving drinking water, buying fewer perishable foods and relying on home-grown produce, and being alert to the amount (or lack) of energy available for charging devices. Off-grid homes, though not for everyone, illustrate what is possible when residents understand how their home functions and the limitations of its infrastructures.

**Embed into place**

Place matters. It matters because of its locale and how it is currently valued and understood (Vasudevan, 2011). It matters how a new eco-home connects (or not) to other places through the use of common infrastructure, or through social links to others near and far. It matters because home can be conceived of as a particularly significant type of place (Easthope, 2004; McCloud, 2011). Place matters precisely because it is more than just the locality of a piece of land. Place is how humans experience the world.

Place as containing meaning, memories, perceptions and identities, and as dynamic, unfinished and constantly evolving, was rarely acknowledged by the self-builders. Recognising the dynamism and importance of place requires eco-builders to understand existing social relations, meanings and emotional attachments to that place. Understanding place is particularly important in eco-building because ‘buildings can be a point
of articulation for complex contestations over the meaning of and access to certain places’ (Kraftl, 2010, 404). Unless the particularities of place are taken more into account, there is a danger that eco-homes are ‘presented as the universal solution to an essentially contextual experienced and created issue’ (Maher and McIntosh, 2007, 24). It is therefore important to critique processes of place-making to ensure that existing place is understood and incorporated into ongoing transformations of place.

Place is a process whereby builders can ‘invest meaning into the landscape’ (Johnson and Murton, 2007, 126), create diversity between and within places (Longhurst, 2013), and construct progressive forms of place which encourage sharing, compassion, tolerance and an acknowledgement of interdependence with others. In the case studies, there was a tendency to fail to incorporate existing residents’ views of place and to consider place as locally bounded. In other words, it is vital that eco-homes are embedded into places as they already exist, and are designed to ‘fit in’ with existing architecture and socio-cultural norms.

An example of this tension is Lammas eco-village, Pembrokeshire, West Wales. Lammas is a low-impact development of nine smallholdings, which operates off-grid with its own electricity and water supply. Residents have been on site since 2009. They have also built a

Figure 4.3  Almost complete straw bale and turf-roofed house at Green Hills (© Jenny Pickerill)
‘community hub’, which acts as an education centre, shop and as a space available for local people to use. Residents of Lammas have sought to radically alter the place in which they are building. Previously sheep grazing farmland, the residents have a vision of ecologically rejuvenating the land to increase biodiversity, productivity and the variety of wildlife species and crops (Wimbush, 2012) (Figures 4.4 and 4.5). It is a vision of abundance of nature that is rooted in a deep green and permaculture philosophy that advocates the necessity of healthy complex ecosystems for environmental and human survival.

Pont y Gafel farm was identified by Lammas as a place empty of social meaning and with a damaged natural environment. It was considered a blank canvas of physical features open to being (re)made. Repopulating farmland with humans and indigenous flora and fauna is, in part, an attempt to recreate a past when smallholders worked and cared for rural land in labour-intensive ways and, in part, a construction of a new green anti-capitalist rurality (Halfacree, 2003). In this case, Lammas is imbued with a sense of place as territory, a moral place-making and as a frontier project. Lammas has always been very explicit in its quest to reclaim farmland and remake it as abundant productive land with ecological benefits. The place was before delegitimised as poor quality grazing land devoid of environmental and social value.

Figure 4.4  Tao and Hoppi’s house at Lammas eco-village, Glandwr, Wales (© Jenny Pickerill)
This radical rurality challenged many people’s conception of a rural space and, in particular, their attachment to the rural position of Pont y Gafel farm. Lammas faced significant resistance to its proposals from local councillors, residents of Glandwr, and neighbouring farmers. Although Lammas sought to appease some local concerns – developing a Welsh language policy, improving the traffic reduction strategy and ensuring that they supported and complemented the fragile local economy – it also sought to bypass them by generating international support and taking the case to the national Welsh Assembly Planning Inspectorate.

Perceptions of place

What was missing in the early stages of Lammas was an acknowledgement of the local residents’ attachment to the place of Glandwr (Devine-Wright, 2011; Van der Horst, 2007). Lammas failed to adequately communicate the relationship between its abstract green ideals and the particular place of Pont y Gafel farm. While Lammas articulated how its project fulfilled the national needs of a society (for affordable housing, renewable energy and livelihoods), it did little to communicate how and why those needs related to the particular place of Glandwr, or how Glandwr contributed to the problems which needed solving through this new place. Residents’ understanding of a place was
being threatened by newcomers who wanted to remake a place they cherished; and the more it was justified with abstract ideology, the less existing residents felt that Lammas understood the meaning of the specific place of Pont y Gafel.

Lammas quickly learned that ‘even in the middle of nowhere there is a rural community that you do need to engage and you do need to interact with’ (Tao Wimbush, Lammas). Its biggest mistake was to initially fail to understand the complex ways in which place was viewed and valued by existing residents. Seven years on, however, relations with the local community have improved significantly. Lammas has attracted an influx of new residents to Glandwr and enlivened the local economy.

Compounding this opposition was the fact that Lammas appears to be a place of exodus – a retreat from the unsustainable practices of mainstream society and the creation of an isolated community on a remote Welsh hillside. It reflects attempts to reconnect with nature, or create a place immersed in nature. As such, it was a place of post-capitalist practices – what Carlsson and Manning (2010) refer to as ‘nowtopians’ – which, along with the eco-village aesthetics, excluded those who were unfamiliar with the style and facilities (such as compost toilets). This sense of place as exclusion is also present in the ways in which Lammas was trying to disrupt its connection to the mainstream through autonomous housing.

Finally, place for Lammas was relational; it related the impact of its practices to climate change, international environmental education projects, and engaging with the state and distant others. Its goals required reaching far beyond a particular place. Before being able to start building, Lammas had needed to obtain national support from the Welsh Assembly and, in so doing, became symbolic of Welsh support for sustainability innovation, thereby cementing the importance of national state support for environmental policy (Featherstone et al., 2012). Lammas also conceived of Tir y Gafel as only the first of many similar projects, and used the Glandwr farmland as a demonstration place and the community’s internet presence as a way to share its methods with all. Yet place, for Lammas, was also constructed as local, in a bounded and static way. This included the quest to use only local building materials, generate its income from the land, eat locally produced food, and support the bioregional economy. This form of localism was about minimising environmental impact by reducing travel miles. Ultimately, Lammas employed a scaled notion of place as local. Lammas began by understanding place predominantly as a physical landscape. Its encounters with opposition
from the existing residents of Glandwr and its efforts to put its vision of sustainability into practice led it to develop a more complex understanding of place as a dynamic cultural and physical entity that interconnected with other places.

Reconfigure comfort

Eco-living is often associated with forgoing many elements of contemporary life (Dobson, 2007). There is an enduring perception that to be environmentally sustainable requires forgoing elements of comfort, convenience and, to a lesser extent, cleanliness (Shove, 2003). This perception of forgoing is problematic. Comfort is a particularly interesting concept because it is both hard to define and simultaneously perceived as being a crucial element of a home (Rybczynski, 1988). Comfort is neither an attribute of a material nor a universally agreed specific and measurable moment (such as a temperature). Instead, it is an ongoing process, a negotiation between different elements (such as climate, materials and bodies) in a particular place (Vannini and Taggart, 2013). While it is important to better communicate that eco-homes do not necessarily require a loss of comfort, it is also necessary that eco-homes reconfigure some elements of comfort to be more ecologically benign.

Self-builders’ approaches to, and understandings of, comfort varied significantly across countries. British self-eco-builders were most likely to equate comfort with excess and sought to reject comfort as a way of signalling their environmental commitment. This was represented most obviously in the de-prioritisation of building bathrooms, which in many British eco-homes were absent (Pickerill, 2015). Thermal comfort was also reconfigured. Although many self-build eco-homes, such as the ‘tiny home’ at Trelay Community, Cornwall (Figure 4.6), were deliberately designed to be thermally efficient (with thick floor, wall and roof insulation, well-glazed windows and air-tightness), the residents also adjusted their expectations of internal temperatures. Unlike many conventional homes, thermal comfort in this tiny home requires manual activity – to source and chop the wood, light and maintain the log stove, and to shut down and clear out the stove after use. The effort required to heat the dwelling – and the fact that such effort is hard to maintain continuously – encourages residents to adopt other comfort practices, such as wearing additional layers of clothing, cooking and moving about. There is also an acceptance within such homes that thermal comfort will be uneven – both
spatially in the dwelling (there are no radiators in this home) and temporally (unless ‘banked-up’, the fire will go out overnight). Thermal comfort in such a home is therefore variable and changeable and, for some residents, would require adjusting to.

The outcome of such an example is to accept that comfort is a process, not an attribute, and thus we need to build houses that enable people to negotiate comfort through adjustment and adaptation (Cole et al., 2008; Vannini and Taggart, 2013). This opens the possibility of ecological architecture producing comfortable homes; not homes with a guaranteed narrow comfort zone, but homes that are flexible to occupy (Brown and Cole, 2009). This understanding of comfort does, however, require challenging people’s expectations (now normalised) of what thermal comfort is. In part, this includes encouraging people to enjoy the contrasts and changes in temperature around a house – what Roaf calls ‘thermal delight’: ‘comfort can be seen simply as the absence of discomfort but thermal delight makes people happier’ (Roaf et al., 2007, 319). Examples are the joy of a fresh breeze through an open window, or the sun heating our toes. This has been developed into the RayMan model, which calculates thermal comfort by taking account of people’s thermal sensations (Matzarakis et al., 2010), but it also extends to individual behaviour, such as the need to wear a jumper indoors during winter (Fordham, 2000).

Figure 4.6 A ‘tiny home’ at Trelay community, Cornwall (© Jenny Pickerill)
The debate as to whether eco-houses can be as comfortable as conventional housing is, of course, also bound up with the ongoing debates as to what is comfort and comfortable – a standardised homogenous temperature or the thermal delight of change (for example, the growth of air conditioning is a reflection of the preference for homogeneity, see Miller et al., 2012)? Our senses and experiences of bodily functions are important when evaluating new forms of living that might extend our interactions with new sensations. The implication of these different approaches to comfort is to illustrate that comfort is not predetermined or fixed; instead, it is a process that can be renegotiated. The creative and resourceful measures by which the residents of these eco-homes have established a sense of comfort suggests the possibility that other forms of comfort (particularly those which are resource-greedy) could also be reconfigured. Thus, eco-homes need to navigate the tension between being perceived as comfortable ‘enough’, while also reconfiguring comfort to reduce the environmental impact of daily household practices.

Conclusions

Eco-building remains a niche, marginalised as a design and an approach in all but a few countries. Too many myths persist about eco-homes being more expensive, uncomfortable, inappropriate or too quirky. The commercial construction industries remain too conservative and are resisting new techniques and new practices. The default approach to housebuilding is to ignore environmental concerns or, if the environment is considered, only to apply technological solutions. Self-build eco-homes clearly have a long way to go before they are considered the norm.

The socio-cultural expectations associated with homes complicate the adoption of more self-build affordable eco-homes. It is not just a matter of building homes to align with the existing norms and desires of residents, for to do so would undermine much of what such eco-homes offer. This is why an analysis of these cheaply assembled eco-homes too often marginalised as ‘quirky’ outliers is so important. If we simply build homes that accommodate existing resource demands, albeit with some small reduction in environmental impact, then we fail to fundamentally alter daily practices enough to respond adequately to climate change. Instead, these affordable eco-homes and their attempts to dramatically shift practices and consumption help us identify the limits and possibilities of eco-homes.
Through the analysis presented here, four socio-cultural elements have been identified that are crucial to understanding what these homes are trying to do and how they challenge existing norms. For each of these elements there is a question of balance to be achieved between acquiescing to existing norms and challenging them by proposing new daily practices and landscapes. The identification of an appropriate balance remains an ongoing tension in the case studies explored, although this is perhaps less a matter to be resolved than an aspect of ongoing negotiation, consisting of different dimensions. First, while there is a need to align eco-home designs with the socio-cultural desires in a home – a space of social relations filled with emotions, traditions and politics – there are also attempts to shift these expectations in, for example, notions of privacy and sharing. Second, accepting that human agency is central in the functioning of an eco-home, and that an eco-home’s functioning is reliant upon compliant occupants, encourages the use of simple design features and feedback loops. It also reminds designers of the need to build systems that cannot easily be disrupted; in other words, to build robust processes that enforce ecological practices. Third, the need to embed eco-homes into places and pay attention to what already exists in a place is vital, not just for local acceptance but in order to appeal to diverse future potential residents. Finally, it is possible to reconfigure some elements of comfort to be more ecologically benign without creating discomfort. The flexibility of comfort can be utilised more.

Central to all these elements is the tension between the social (people, societal norms and structures) and the material and technological (walls, technological systems, windows, etc.) features of eco-homes. In order to fully understand eco-homes, none of these elements can be examined in isolation. They interact, shape, influence and have agency. This chapter demonstrates that we urgently need to know far more about eco-homes than just technological questions of construction or political questions of land availability. Instead, we must embrace qualitative investigations into the why, how and with what consequences people choose to build and live in these homes. Only through such analysis can we begin to understand how to encourage and enable more self-build eco-homes.