

# Low impact communities in Britain





## Introduction

My interest is in how people are building low cost eco-housing themselves, why, what makes it work, what is it like to live in it, and what are the constraints and opportunities to doing more of it in Britain.

It is important to focus on [actually existing examples](#) – there are plenty of dreams out there that are never realised, so this report uses evidence collected from over 30 low impact housing case studies worldwide to reflect upon low impact communities in Britain.

I have been researching low impact development and low cost eco-housing in Britain and overseas for the last seven years. I am particularly interested in collective eco-housing and self-build projects. This report is primarily about new builds, but it acknowledges the vital importance of retrofitting to reducing the environmental impact of our housing.

That said, housing should be just as much about justice as the environment. It is possible to build a very low impact ecological house at high cost but it would be difficult to replicate for others and as such cost is embedded into the debates about what a good house should be and do.



Lama Foundation, New Mexico, USA



Dignity Village,  
Portland, USA

## Defining low impact housing



Pun Pun, Thailand



Crestone, Colorado, USA

The broad definition used in this report is that [an eco-building minimises resource use \(in construction and life-cycle\) while also providing a comfortable environment in which to live](#). In other words, a good eco-building balances our need for comfort with ecological impact. An extremely ecological house that provides no comfort does not satisfy our human need for a home.

This can be achieved in numerous ways and there is a breadth of approaches between buildings which use technology to reduce their environmental impact and those which rely upon natural materials and a low impact lifestyle. The more natural buildings can actually have a negative carbon footprint because materials like straw actually store CO<sub>2</sub>. Eco-building thus requires careful consideration of location, materials, resource use, toxicity, durability, reclamation potential, biodiversity, aesthetics, relation to community, and the ongoing dynamic relationships between people and their homes.

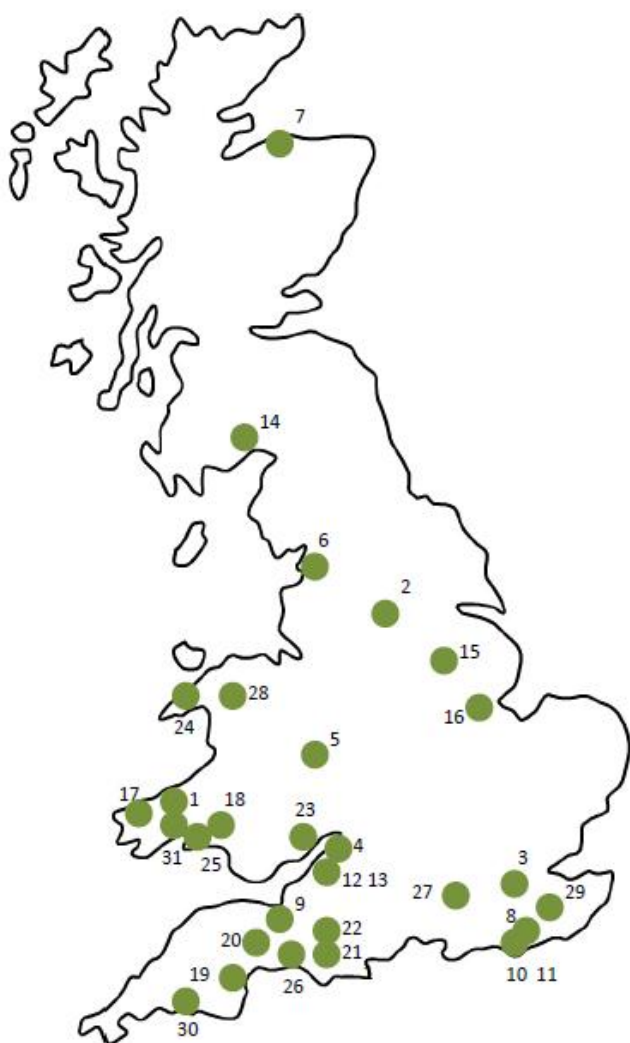
Low impact housing is a subset of eco-housing, a holistic approach to housing which includes all aspects of daily life – food, resource and energy use, transport, livelihoods and reduced consumption.

## Low impact communities

Low impact communities are those projects which:

1. Seek autonomy and self reliance, and thus seek to generate all that they need
2. Often have mixed goals but tend to include becoming more socially, economically and ecologically sustainable
3. Tend to share values. Some are thus intentional communities, others less so, but most have community agreements by which all occupants consent to
4. The ethos is self-build and do-it-yourself
5. Are structured around living and building collectively and often include sharing communal space
6. Involve a care and consideration for others. This can include deliberately seeking to reconfigure existing relationships, such as practising gender equality
7. Are low-cost and often build affordability for perpetuity into the long-term design
8. Can require a change of lifestyle and/or income generation
9. Seek minimal resource use (in construction and life-cycle)
10. Have low visual impact
11. Are built from local, recycled or natural materials
12. Are often small scale

These include rural and urban projects, despite urban projects often having less space from which to generate energy or alternative incomes. Overall such communities are concerned with much more than just the architecture, rather it is [the way people live, and live together, which is significantly more important](#). In terms of how these communities compare to eco-housing *per se*, the novelty is the way in which they bring all these different aspects together in one place.

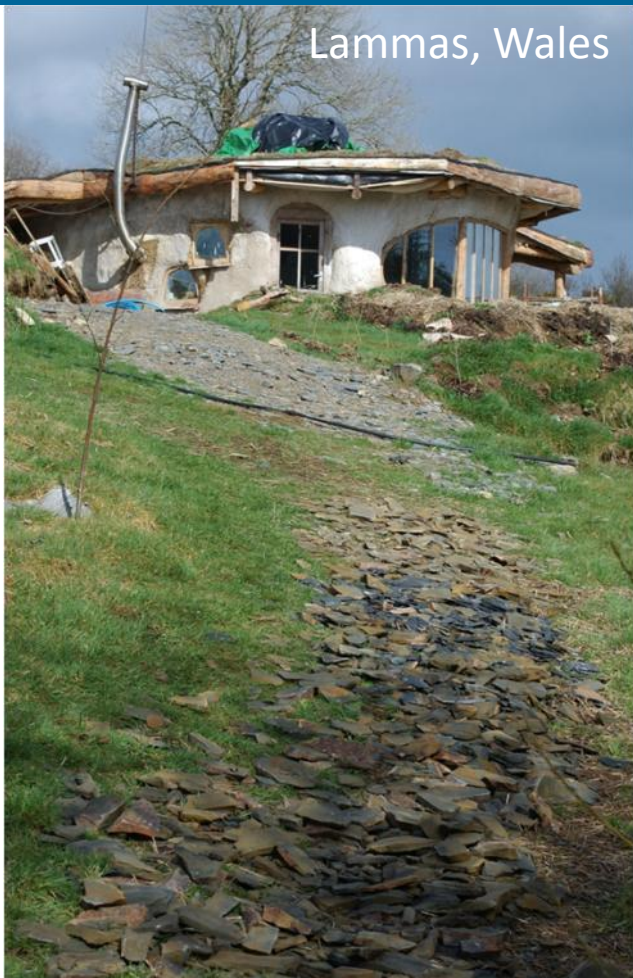


## Low Impact Communities in Britain

1. Lammas
2. Low Impact Living Affordable Community (LILAC)
3. BedZed
4. Springhill Co-housing
5. Karuna
6. Lancaster Co-housing
7. Findhorn
8. The Community Project (Laughton)
9. Great Bow Yard
10. Dryad Housing Cooperative
11. Hedgehog
12. The Yards
13. Ashley Vale
14. Green Hill
15. Hill Holt Wood
16. Hockerton Housing Project
17. Brithdir Mawr and Tir Ysbrydol
18. Tipi Valley
19. Landmatters
20. Steward Community Woodland
21. Tinkers Bubble
22. Kings Hill Collective
23. Coed Hills Community Art Space
24. Menter y Felin Uchaf
25. Woodhouse Wood
26. Fivepenny Farm
27. Northdown Orchard
28. Cae Mabon
29. Quicken Wood
30. Keveral Farm
31. Down to Earth



## Lammas, Wales



There are 4 case studies which help us understand the possibilities of low impact communities in Britain. In particular it is useful to see what lessons can be learned from overseas and hence the inclusion of examples from the USA.

**Lammas** is a newly-built intentional eco-community near Glandwr village in Pembrokeshire, West Wales. It is sited on 175 acres of mixed pasture and woodland. After many years of resubmitting planning applications they finally secured permission to build on old farmland in 2009, and now nine dwellings are being built. The community has tried to be as low cost as possible and all families are self-building their houses from local sustainable materials. Examples include a straw-bale roundhouse, a timber frame house, and an earth sheltered house built using roundwood, earth and stone from the land, straw bales and reclaimed materials. In addition to building low impact houses the community are focused on generating 75% of their livelihood from the land and thus have been busy establishing new land-based businesses.

Lammas sought funding from a variety of sources: a share sale, a government grant for a community roundhouse, and the individual purchase of plots (and thus building materials).



## Hockerton Housing Project, Nottinghamshire



**Hockerton Housing Project** is a five house earth-sheltered terrace in Nottinghamshire. It is one of the first low impact communities to be built legally in Britain. It has won a number of prizes for energy efficiency and zero-carbon emissions. The structure has a particularly high thermal mass because it is built into a hill with large insulating walls and it uses passive solar gain to heat the houses. It is self-sufficient; wind power is used to generate electricity, they harvest their own water, and a reed bed system to dispose of their sewage. They have proved that their style of construction can work with a replicable and simple design which has radically reduced energy use and CO<sub>2</sub> emissions.

Hockerton has been criticised for using a significant quantity of concrete (though they argue that given its long life it is worth the environmental cost in the long run). For some the internal design is not popular because there are no back windows and thus there are issues of light internally. Also there is a need for a large amount of land (all south facing) to replicate the design. Finally, although relatively cheap when built, affordability was not assured for perpetuity and thus individual units have since been sold at above market rate. Perhaps Hockerton's biggest achievement has been the way they have changed the politics of building; they have pushed planning in new directions, especially around renewable energy, lobbied and set up an education centre.





Kailash Ecovillage,  
Portland, USA

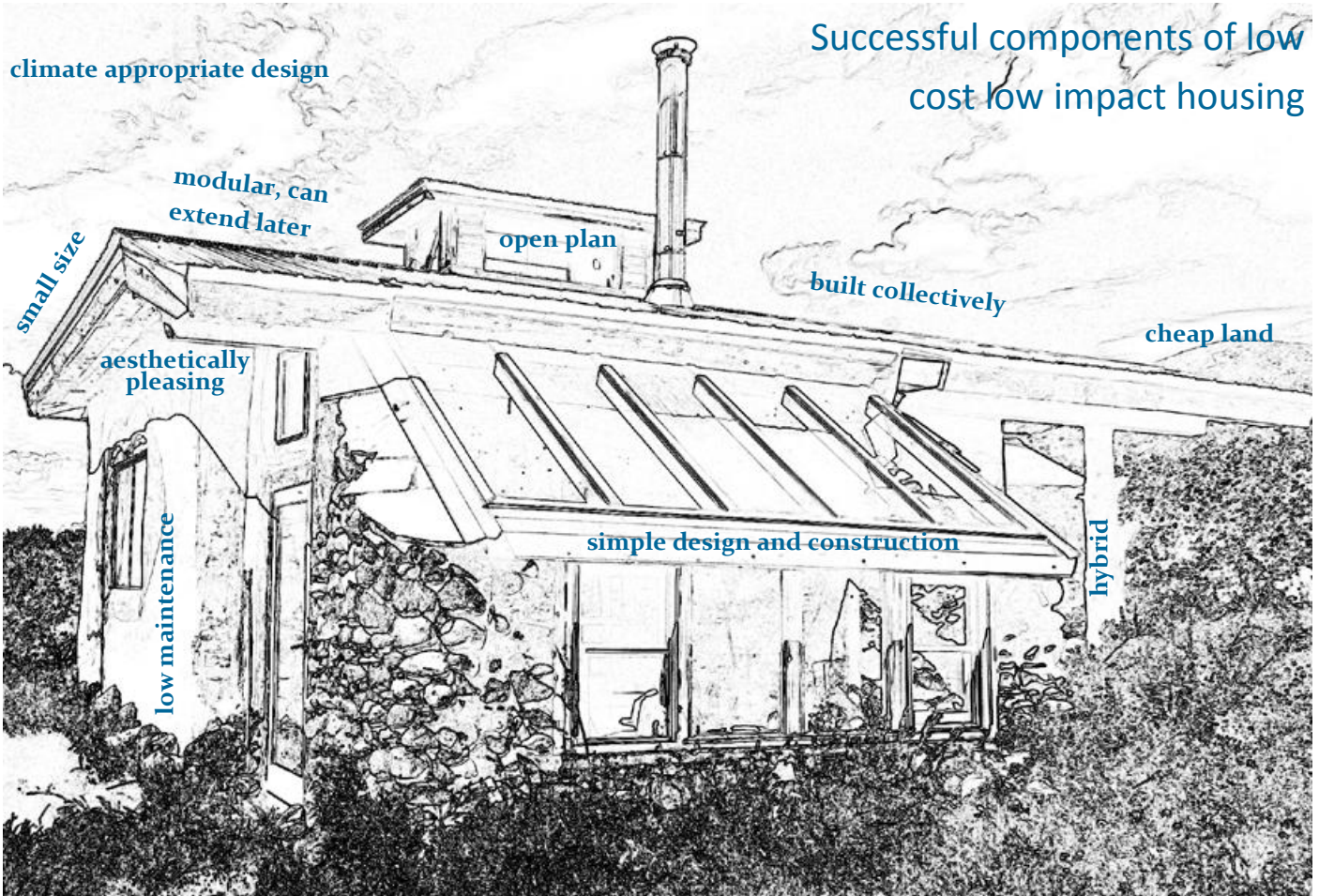
**Kailash** is an eco-village with a difference. The owners took an existing 1959 apartment building and eco-retrofitted it with an explicit focus on affordability—a rental rather than owner model and the units can be rented cheaply. Moreover, they have provided small-scale units for single people, which is often missing in eco-housing provision. At the same time each unit is the same size and thus the eco-village is only really suitable for small households; this limits its long-term community potential. The eco-village is not run using collective decision-making, but instead it is organised as an easy way to allow people to try out community living without the risks (or barriers) of capital investment. The village still runs community projects – collective gardens, out-reach projects, community room— but does so in an accessible way and by looking quite conventional overcomes any negative stereotypes about alternative living.



Dignity Village, Portland, USA

**Dignity Village** is a site for the homeless built by the homeless. This site has been built and run by homeless people to give them free housing. It started as a squat protest and permanent land access was then negotiated. Houses have been built using all sorts of scrap reclaimed materials – wood, straw, adobe, metal. They have used donated material and donated labour, enabled homeless people to build their own homes, as they wish and how they want, enabling creativity rather than forcing people to live a certain way. It is also very cheap. The houses are not as ecological as they could have been, with some which are overall poorly insulated. The straw-bale house has been badly maintained because skills were not passed on (or resisted). However, it is an excellent example of low cost low impact housing, and illustrates that anyone can build a house.





## Building low impact housing and communities

We know how to build low impact housing— as shown above—but some aspects of doing it are easier than others, and there are barriers to building this way in Britain. For example the availability of cheap land is limited, the choice of materials to use needs to be shaped by availability and climate, modular and open plan design is not yet conventional in Britain, and building collectively is still a rare approach.

In particular it is important to note that place matters – we have to build houses to suit their location (not simply transplant designs from one place to another), to be appropriate for that particular climate, to suit what materials and skills are available, so we need to use the above diagram as a guideline and then re-interpret for specific locations.

We can look at the barriers and opportunities of building low cost low impact housing by considering them as divided into three different themes:

1. **Political**
2. **Economic**
3. **Cultural**

All these themes are interconnected and affect each other, and all are related to how we tackle environmental impact. However, we have different elements of control over each category, and need to tackle them in different ways. Crucially, we need to consider *all* these aspects. If one is excluded then our ability to effectively build low cost low impact houses is reduced. Thus the cultural aspects of low impact housing are just as important as questions about costs or planning.



## The political barriers



Green Hills, Scotland



Green Hills, Scotland

There are political barriers to low impact communities in relation to planning, government support, and regulations:

**Planning:** The different ways in which planning legislation is implemented across Britain, from national decisions to local council decisions disrupts the possibility of low impact housing. There is also a fear that the new Localism Act will complicate this further and is unlikely to enable an easier process for eco-housing (through increased power of local objection and local vested interests) though it might lead to clusters of innovative housing in some progressive regions.

**Government support:** Although national government has variously introduced legislation to aid in the reduction of CO<sub>2</sub> emissions and energy use in new houses (such as Code for Sustainable homes, all new houses to be zero carbon by 2016) the legislation often ends up watered down. Zero carbon homes legislation was the most stringent in the world, until it was changed in 2011.

**Building regulations:** These are increasingly positive and minimum standards have progressively improved and developed, along with a set of aspirational standards (such as Code 6) that set the scene for innovative solutions to low-energy homes and the evolution of regulatory standards. In Britain they are guidelines of what has to be achieved (such as U-values and fire resistance) but there is flexibility in how it is achieved. However, these do not go far enough (Sweden has made Passivhaus standard mandatory for all buildings) and can constrain innovative building.

## The political solutions

Potential solutions to these political barriers include:

**Building within regulations:** Work with council and building inspectors, have to, they cannot be ignored or costs will be significant (both time and financially). For example Lammas sought exception from building regulations for temporary accommodation but have struggled to get such exception formally approved. However, it is also necessary to push for a relaxation of building regulations. Where they have been relaxed, innovative, creative and safe eco-housing has been built. For example in Crestone, Colorado, USA.

**Design beyond building regulations:** Use them as minimum standards.

**Support special exception:** Special exception should be made for allowing eco-houses to be built on land not available to other forms of construction. We need to support those policies that have enabled eco-housing development such as the Welsh One Planet Development. We also need collective political lobbying to ensure progressive planning legislation.



Carriage house, Crestone, Colorado



Straw bale house, Crestone

## The economic barriers

There are economic barriers to low impact communities in relation to costs (land, materials, labour) and availability of land:

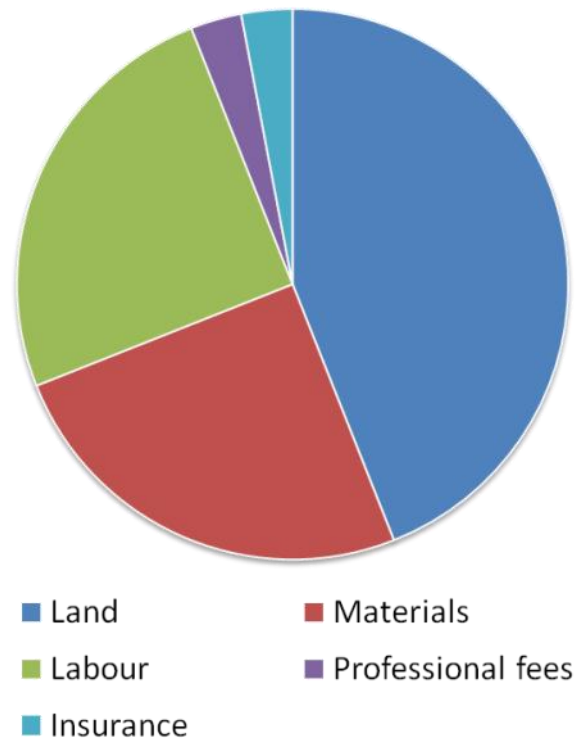
**House prices:** Housing seen as investment opportunity rather than shelter. Emphasis on ownership rather than occupancy contributes to high cost of housing and thus also land. Mortgages are the largest household debt. Affordable housing simply means below market rate, not necessarily 'affordable'

**Uneven demand:** There is a spatially uneven demand for housing which results in a spatially uneven land cost = especially high in SE and SW. Empty homes – not good use of existing stock. Also growth in smaller households (1 and 2 adults) – changing demographics

**Land availability:** No scarcity of land (90% of Britain is green space), but land price is a key problem, caused in part by difference between agricultural market price and development price. This is under political control, for example development land in Sweden costs 4 times less than its equivalent in Britain. Moreover 70% of land is agriculture and is controlled by 0.28% of the population in Britain.

Overall we tend to end up with a high cost of land, labour and materials.

Indicative build cost components



## The economic solutions



La ecoaldea del Minchal, Spain

Potential solutions to these economic barriers revolve around understanding what costs really are and then which aspects are easiest to reduce. In most cases this is the labour and material costs. Thus costs can be reduced by:

**Labour:** Self-build to reduce costs of labour.

**Materials:** Choosing low cost locally available materials – such as straw or adobe.

**Land:** Locate in less sought-after places or marginal land – for example autonomous living in the desert of New Mexico. It could be argued that the growth of affordable housing only ever happened when land owned by state, so there is a need to take land out of the market mechanism. We can remove land from market mechanism for perpetuity through Community Land Trusts. We also need to be lobbying for better consideration of how we categorise and use our land in Britain.

**Costs:** Ensure that houses remain affordable in perpetuity by using mutual or rental housing agreements. We could calculate costs as a ratio of income. LILAC is using a 35% ratio for their equity share costs. Other sources of funding include: share sales, government grants, mortgages from ethical and ecological building societies. We can also look to change the sources of income, for example Lammas who are developing land-based livelihoods.

Overall we need to be rethinking costs from just initial build costs to lifetime costs of a build – eco-housing looks more affordable by that measure because running costs are so much lower.



## The cultural barriers



Lama Foundation, New Mexico, USA

There are cultural barriers to low impact communities in relation to aesthetics, behaviour, knowledge, and community agreement:

**Knowledge:** There is uneven application and interpretation of legislation across Britain influenced by levels of knowledge of inspectors and planners. Without knowledge will use easy and cheap materials – concrete. So knowledge key to ensuring good choice of materials and that people have necessary skills.

**Aesthetics:** Eco-houses often look and feel very different to conventional homes – we should not underestimate the importance of this.

**Community agreement:** We are not used to working collectively – too much focus on individual desires and needs

**Behaviour:** If don't change household behaviour then cannot change culture of dwelling; need to change habits and practices. There is a gap between environmental concern and environmental behaviour. Behaviour is a practice and habit (not always conscious of what we do). Our reliance on central systems counters people's ability to take ownership of the functions of their homes. Need to understand that change is not linear, makes big jumps, but if things appear to change gradually we make no changes. Humans are not necessarily rational beings.

## The cultural solutions

These are perhaps the hardest but most important barriers to challenge. Potential solutions to these cultural barriers include:

**Knowledge:** We need participatory processes so people feel involved in the design. This involves asking people what they need and want. At same time, role of pioneer and risk-taker is important to drive project forward – so fine balance is needed between participation and leadership. A practical education is a key part of this; people need to see and feel how things work to understand them.

**Suitable for residents:** For example, the straw bale council house in Lincolnshire, the only source of heating is a wood stove and relies on passive heat. Inside it is open plan downstairs, but many of the residents did not like the internal layout.

**Behaviour:** Behaviour change best altered through peer pressure.

Overall we need to understand that '**whenever you are doing something, if it is hard, it is wrong**' (Jon Jandai, Pun Pun, Thailand), and apply that to our approach.



Papercrete house, Crestone



Modcell straw bale house, Bath



## Common pitfalls

The common pitfalls in building low impact communities are:

1. Not working collaboratively with planners and building inspectors
2. Not altering imported designs for their different British location
3. Not planning for material costs increases
4. Making assumptions about building regulations
5. Ignoring the need for experts
6. Trying to do things too quickly (both in terms of the build and in building community agreements)
7. Forgetting to factor in long term maintenance costs
8. Underestimating the importance of comfort to design



Bathroom in an Earthship,  
New Mexico, USA

## What works?



So what is the best way to build a low impact community in Britain?

1. Use hybrid materials or straw bale
2. Have a mutual housing ownership or a rental model
3. Build collectively
4. Have a pioneer and a risk taker driving project
5. Share key infrastructure, by having a co-housing or organisational structure
6. Build on 'marginal' land or remove land from the market mechanism
7. Build small with an open plan design
8. Use locally available materials
9. Minimise use of technology
10. Plan long-term maintenance
11. Establish strong community agreements
12. Have a good simple passive design



## Other considerations



Building a zome in Spain



Zome at La ecoaldea del Minchal



### Are we future proofing our housing for climate change?

We are building eco-housing that is suitable for today's climate and reduces carbon emissions, both of which are important, but it is not enough. We need to be designing houses which will be suitable for the future climate of wet, hot, unpredictable weather.

### Are we doing enough to (eco-)retrofit existing houses?

As soon as we start to talk of building better houses the issue of our existing housing stock is raised. Thus far we have focused on quite small changes (such as extra insulation) or adding technology to houses.

### How does gender change how we might build eco-houses?

Building is still dominated by men, both in obvious and subtle ways and this is influencing how and what is being built. Houses are different when designed and built by women and there are a growing number of women-only build groups like the Mud Girls from Canada. Yet there remains little awareness of gender and eco-building and it is something we still need to explore.

### The long history of eco-building:

There have long been attempts to build more ecologically, but do we really understand these and why they were successful or failed? It is important to have a historical perspective in understanding social and architectural change. We often blame lack of progress on contemporary barriers, but historically did not make much progress either. The Dymaxion house, for example, was a dome shaped house designed by architect and visionary Buckminster Falls in 1929. It is considered the first conscious effort to build an autonomous building.

## Conclusions

There is not one way which works; lots of different approaches have worked and we have to adapt ideas to location and place.

There are combined political, economic and cultural barriers to be overcome: cultural barriers are as important as economic barriers.

There are plenty of actual examples of low cost low impact housing. There is plenty of inspiration.

However there is also plenty of work yet to be done in lobbying for national government changes and for careful local implementation.

We also need to continue to learn from others mistakes.





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