

LEHII Case History: Wichelo Place

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1. Introduction

Wichelo Place is a four-bedroom Victorian mid-terraced house, built in 1867 and located in Hanover, Brighton. The building was extended and extensively retrofitted in 2008-2009 at a cost of around £35,000 and now has 125m² over four floors. In order to improve energy efficiency, reduce energy consumption and create a healthier and more comfortable home, measures such as internal and external wall insulation, improved airtightness and renewable energy have been installed. Originally an E-rated house¹, Wichelo Place was estimated to be B-rated following its retrofit. The house has been showcased several times in the Eco Open Houses Brighton & Hove² event with the owner Paul Early keen to share his experience of retrofitting a Victorian property.

Technical features

- Draughtproofing
- Floor insulation
- External wall insulation
- Highly insulated loft insulation
- High performance glazing
- Low energy lighting
- Natural materials
- Solar thermal panels
- Woodburning stove

1.1. Key insights

- Inspired by a Masters course undertaken in the Centre of Alternative Technology³, Early was confident to take on retrofitting his Victorian house and be an early pioneer by installing novel technologies such as external wall insulation in Brighton
- Early wanted to create a home that would be highly energy efficient and use natural materials where possible, also thinking of the transport of materials to the site.
- Advancement of energy efficiency requirements of building regulations and a local network of likeminded people motivated Early in his efforts to carry out the whole house retrofit
- There were no intermediaries directly involved with the retrofit project, but CAT stimulated the initial emergence of the project and Eco Open Houses and Hanover Action acted as intermediaries diffusing the knowledge from it. In addition, some information was sourced from the Energy Saving Trust website.
- Public policy was directly influential through local council grant to install solar water heating system. In addition, the project was somewhat disturbed by the incoherencies and uncertainties in the local planning department.
- While estimating how much energy consumption has reduced since the retrofit has been difficult – given the increase in family members and the subsequent change in the way the house has been used – living comfort of the house has exceeded all expectations

- Wichelo Place has been showcased in the Eco Open Houses Brighton & Hove annual event since 2009, providing opportunities for others to learn from the retrofit project

2. The beginning: drive towards a sustainable home

Wichelo Place is owned by Paul Early, an engineer by trade who has worked in the rail industry since 1989. Early has had a growing interest in environmental issues ever since 2000 when he undertook an MSc in Energy and Environmental Studies, which was delivered on behalf of the University of East London by the Centre for Alternative Technology (CAT), in Wales. As part of the MSc course, Early visited also a number of buildings that were being renovated.

In May 2007, Early and his family moved to Hanover, buying an old Victorian property. Wichelo Place was typical of the houses in the Hanover area, a solid wall property which due to its poor quality build and equally poor quality renovations over the years was cold and suffered from condensation and damp (interview comment, Paul Early).

“When we moved into the house it was very typical of the local area. It had been rented out for many years, it had undergone numerous poor quality renovations. It lacked doors that fitted on rooms, the double glazing that was fitted was not very good quality. It was draughty, in the winter three of us would sit on the living room sofa under a blanket, watching the television with the heating on and still be cold. It also had issues with damp, probably through condensation in the cold months. It was not a particularly thermally comfortable building.” (interview comment, Paul Early)

Having completed the MSc gave Early the “confidence to go ahead with my own project, once we’d bought a house that needed renovation” and he felt that he could make “radical changes to its energy performance” (interview comment, Paul Early). At the time, Early was also doing consultancy work in green roofs and green walls. Early started to plan the retrofit soon after moving to Wichelo Place, but it took almost a year to have everything in place and check relevant building regulations, which in turn gave Early time to experience the property over a winter period (interview comment, Paul Early).

3. Design and planning stage

Retrofitting the house had two main aims: to reduce energy consumption and also to make the house more comfortable, “a healthier environment to live in” (interview comment, Paul Early). Improving the

energy efficiency of the building was especially key and Early was inspired by a report published by the Environmental Change Institute at Oxford University in 2005, *The 40% House*⁴. The report outlined the energy efficiency challenge of UK's housing stock and highlighted that by 2050, 70-80% of existing housing will still be in use.

“We at the time were quite influenced by a report called the 40% House. It was all about, that basically we’ve already built 70% or 80% of the housing that’s going to be with us by 2050. Therefore, we should be looking to at least reduce the energy usage of that housing stock substantially. I think the figure was 40% at the time. In my mind that was at least what we wanted to get to.” (interview comment, Paul Early)

Furthermore, Early was also enthused by the latest Building Regulations, especially Part L⁵ which had been updated in 2006 and *“was a big improvement, that was something to look to, at least try and meet if not better”* (interview comment, Paul Early). Early was also inspired by Brighton & Hove City Council's incentive which provided grants worth of £1,000 for solar energy at the time. The Council also had a list of approved solar suppliers. Early applied for a solar grant and received one.

3.1. Identifying architects through local networks

Early identified an architect in July 2007, now called Arch Angels, whom he commissioned for the project and who *“drew up the plans and engaged a structural engineer”* (interview comment, Paul Early). Early knew the architects before as he had met them through green building initiatives, and they had an aspiration to work on a sustainable building (interview comment, Paul Early). At the time, Early regularly attended monthly meetings of the Association of Environmentally Conscious Builders (AECB)⁶.

“At the time we had monthly meetings [AECB], so I was meeting people through that. Things like Ecobuild up in London. I was doing talks about doing roofs, and getting involved in community activities at the time.” (interview comment, Paul Early)

There was a like-minded *“crowd of people in Brighton who had a common outlook on these sort of things”* at the time and Early was getting to know people through attending various events and meetings (interview comment, Paul Early). Early for example attended social gatherings such as the ‘Green Drinks’ and ‘CAT drinks’ – the latter was mainly attended by people from Brighton who had been on the same MSc course at CAT as Early (interview comment, Paul Early). This group of people have *“turned*

themselves into eco-builders, architects, there is a little network of people” in the Brighton area including for example a Sustainability Consultant and a local authority Sustainability Officer. Early also visited BRE⁷ - a building science centre - and events such as Ecobuild⁸ – now one of the UK’s largest events on built environment.

Early worked closely with the architect in designing plans for the retrofit, which *“took two or three months for the process to go through and go through the structural engineering”* (interview comment, Paul Early).

3.2. Gathering information and choosing materials

Early’s approach to the retrofit was to reduce energy consumption first and then consider using alternative energy sources (interview comment, Paul Early). For this, the plans used the SAP¹ modelling system, which was the primary modelling system at the time to assess energy performance of buildings.

Early wanted to use natural materials where possible – during his MSc studies Early had learnt about building health, and its links to issues such as sufficient ventilation and low impact products (interview comment, Paul Early). At the time, there was not much information available about novel technologies such as external wall insulation, and even less examples of Victorian retrofits, but the Energy Saving Trust⁹ website proved to be useful (interview comment, Paul Early).

“The Energy Saving Trust had some reasonable information about solid wall insulation, but there wasn’t a lot of [information] easily. If I was a member of the general public and I hadn’t studied in the area, it would have been a lot more daunting. Just simply because the products are, or were at that time, quite novel. You’re starting to build a tighter building, you have to start thinking a lot more about damp, water ingress and all these sort of things. There wasn’t really anything out there, in terms of what do you do for external wall insulation, where you’re putting an impervious layer of insulation on the outside.” (interview comment, Paul Early)

Part of Early’s research included thinking through ventilation, as he wanted to avoid problems with moisture and potential damp appearing in an airtight house, even though he knew that his house was dry prior to the retrofit works (interview comment, Paul Early).

“We had an absolute non-breathing wall, it was concrete on the outside. It was some sort of gloss paint on the inside, so there was no breathability of the wall. We already knew we had a very dry house. Had I lived two doors down the street, it might have been completely different because each house is almost bespoke in the street. Even though they look similar, the way the gardens are at the back of the houses, they change the water table. This house is a concrete floor, and it’s entirely dry but next door might still have the original floor boarding. They all have very different patterns. It just happened that this was quite a straightforward house, in terms of some of the research I had to do.” (interview comment, Paul Early)

Identifying suitable natural materials was largely down to Early and he engaged with various suppliers directly. For example, he visited a sheep wool insulation manufacturer during one of his work trips and spoke to people like Cath Hassell, now a well-known consultant in the solar thermal industry (interview comment, Paul Early).

While Early wanted to use as many natural materials as possible, he also had to be pragmatic, and with all choices, such as external walls and windows, he needed to weigh costs and benefits (interview comment, Paul Early). Early for example considered triple-glazed windows but given the expense and the fact that the house gets a lot of sun upstairs Early chose *“what were at the time, far better than the average double glazing, an average U value of 1.5 for the windows, wooden frames which have a long-lasting coating on them”* (interview comment, Paul Early). Issues such as transport miles were also of interest to Early, albeit this also proved challenging with some materials such as the windows.

“Things like sheep’s wool insulation, which was quite expensive. Was also quite nice environmentally, in some respects, because I was buying fleeces from Herdwick sheep in the Lake District. They have an integral relationship with the land, and the way the land management is in the Lake District, is dependent on that variety of sheep. That wool came straight down to Bradford, was scoured and made into vats. It then went down to a distribution warehouse in Kent, and then came here. It was almost a straight line, and I really like that. That was an attraction to me, of things like transport miles. That was some consideration, in terms of trying to be reasonably efficient and then, of course, not following

that through because the windows came from Latvia. Then I've used stainless steel mesh on the front face of the building. Some things worked out quite nicely like that, but in other areas we just found it very difficult to follow that through.” (interview comment, Paul Early)

At the time, there was not a large choice available of natural and sustainable building materials, and Early “*could just do a quick matrix to see how they fitted in with whatever*” he wanted to do (interview comment, Paul Early).

3.3. Incorporating sustainable energy

While Early wanted to insulate the house as much as possible and provide good ventilation, he also wanted to use renewable energy where possible. Early considered installing solar PVs but at the time, in 2008, there were no incentives such as feed-in-tariffs (FITs) available (FITs were introduced in the UK in 2010), so solar PV proved to be too expensive. Instead, Early opted for solar thermal water heating, for which he also received a grant from the Council.

“We looked into putting [solar] PVs on but that was very expensive at the time. There were no feed-in tariffs. Instead we put solar water heating in and we went for an oversized system to give us a longer heating season.” (interview comment, Paul Early)

In addition to solar thermal water heating, Early also wanted to install a wood burning stove in the living room, which came “*as a little bit of an afterthought*” (interview comment, Paul Early).

3.4. Checking planning permission

The retrofit plans included both external wall insulation and new windows, and one key issue that Early had to ensure was whether he needed planning permission for these, given that his house was located two houses away from a Conservation Area (interview comment, Paul Early). Early spoke to Brighton & Hove City Council to find out what planning permissions he might possibly need.

“We are two houses away from the Conservation Area, and so part of the research before starting all this was to determine whether or not we'd need planning permission for things. The one area we didn't know, it's fair to say, actually, there was a local document that was issued. Not long before we started doing the work. That was about renewables, so the council had guidance for things. I also talked to people in the council about whether they were going

to come out with a guidance, say, for external wall insulation.” (interview comment, Paul Early)

Everything else apart from the external wall insulation was considered permitted development, so Early asked the Council whether he needed planning permission for that. The initial answer from the Council was that they “*don’t really know*” so Early applied for a planning permission. A few weeks later someone from the Council contacted Early and told him that he did not need planning permission for the external wall insulation after all (interview comment, Paul Early).

3.5. Choosing a builder

In terms of the actual building works, Early had a contracting process where he invited three quotes, and then “*engaged a builder with a formal contract*” (interview comment, Paul Early). Early appointed AGM Builders, who were keen to get involved in “*something different*” at the time and the Wichelo Place project “*suiting their outlook on life*”, even though they did not have much previous experience of sustainable building (interview comment, Paul Early).

“The things that did stand out were that although they [the builder] hadn’t got a lot of experience in this area, because not many people had actually done this at the time, they were keen to understand and learn, they were happy to go off and learn about lime mortar. It was the attitude that they had, was good at the time. Since, they’ve certainly done quite a number of projects since. They’ve had some environmental element to it. (interview comment, Paul Early)

4. Retrofitting stage: completing all works at once

Having chosen a builder, Early was able to go ahead with the retrofitting of his house. The actual building work started in June 2008 and Early incorporated a loft extension into the retrofit project, so that he could “*do everything we thought we were going to ever do on the house all in one go*” (interview comment, Paul Early). As a result a dormer, with high level of insulation, was installed on the top of the house.

“We put 150 mms thick of sheep’s wool insulation within the roof of the dormer, on the sloping surfaces where we were restricted for space. Used isocyanate forms. We zoned the

house by putting cellulose insulation between the floors, because we could. It was easy to do, the floorboards lifted up. The dormer itself is isolated from the rest of the house by 200 mms thick of cellulose insulation. The thinking was that, well, one it was some sound insulation between the rooms, but also it meant that you could open windows. If you want to sleep with the windows open, you can sleep with the windows open. Close the door, and all the heat doesn't get sucked out of the house. That was one of the thoughts that we had."
(interview comment, Paul Early)

Early wanted to maximise insulation benefit, and the front of the house was installed with 80mm thick of isocyanate foam and the house 100mm as it was not fronting onto the street (interview comment, Paul Early). As the Council had advised Early that he did not need planning permission for the external wall insulation, Early had told the builders to "just to get on with" (interview comment, Paul Early). However, whilst halfway through installing the external wall insulation, someone from the Council called Early and enquired about his planning application, wanting to inspect the house (interview comment, Paul Early).

"Somebody rang me up a few months later whilst we were halfway through the external wall insulation and said, "We've got a planning application here. What do you want us to do with it? Are you doing the work?" and I said, "Well, somebody rang me up to tell me that I didn't need planning permission." and they said, "Who was that?" I gave them the name. They said, "Oh, well they've left now and we don't know whether you need planning permission or not. So, we're going to come and have a look." and I never met the people but they must've come along and just gone, "Well, it doesn't look so bad."" (interview comment, Paul Early)

Not needing a planning permission after all was a bit of a surprise to Early as "other people, in the same area, have had planning permission refused for external wall insulation", and in general he thought that the Council was very inconsistent in their planning decisions (interview comment, Paul Early).

For the front of the house, Early had chosen a traditional lime mortar rendering, which was "like a whitewash, traditional sort of tallow and lime whitewash on it, on a stainless steel mesh". However, as it turned out to be difficult to install, Early chose a more standard cement render for the back of the house (interview comment, Paul Early).

“The external wall cladding on the front wall was a bit of a nightmare. The builders called it ‘the wall of doom’ because they were using a very traditional technique of lime render. It’s also quite a caustic material. If you’ve got a cut it wouldn’t heal up, because the caustic nature of the stuff would keep things like that open. From a health and safety point of view, there were things where they had issues and it just took an awful lot of work to get the render, to work the length render to a point where we were happy with it. Then it was painted in about four layers of limewash.” (interview comment, Paul Early)

In the ground floor, Early had to make choices on how to insulate a concrete floor, without it costing too much and in the end, a cork composite floor was installed, which meant that he did not have to redo all the skirting boards or the stairs (interview comment, Paul Early)

In order to ensure adequate ventilation in an airtight house, Early installed *“too many trickle vents in the windows”* as he knew that he was going to create a more airtight house, with increased insulation and new double-glazed windows, that also included a wood burning stove (interview comment, Paul Early).

“It was a lot to do with the stove as well. We wanted to make sure that we didn’t have problems with the stove. The stove is the largest stove we could have without having to have an airbrick. Which seemed to be a bit of a nonsense to do all this work, and then band a hole through your wall with an airbrick. I was conscious that what we didn’t want to do is cause ourselves a problem, like die through suffocation or something with a wood stove.” (interview comment, Paul Early)

The retrofit project took around six months to complete and some of the works proved to be rather disruptive and delays in material deliveries caused issues such as Early having to sleep *“in the dormer with a tarpaulin over where the window should be”* during a winter month (interview comment, Paul Early). However, overall Early was happy with the completed retrofit and he has been active in sharing his experience with others.

5. Learning

The Wichelo Place project has provided ample opportunities for learning about retrofit, especially in relation to influence on living comfort and energy consumption, as well as choice of materials and general management of building projects – all of which Early has also been keen to share with others.

5.1. Temperature monitoring and living experience

Following the retrofit, Early and his family had a year of temperature monitoring completed. This showed that the temperature in the main living areas on the ground floor never dropped below 16°C even without the heating on, which Early thought was reasonable compared to some other Victorian houses which turned out to be very cold (interview comment, Paul Early).

“We had a year’s worth of monitoring done for temperature monitoring, and that showed that our house never got below 16°, in the living areas. In this ground floor it never got below 16°, throughout what was quite a cold winter. Even if the heating wasn’t on for 24 hours and there was no stove on or anything. I thought that was reasonable, because 16° is still warm enough that if you’re doing tasks, and walking around you’re not cold. If you sit down, then you need some additional heat. It was quite interesting. The same study looked at a number of Victorian houses, and one house never got as warm as 16°. Goodness knows what that was like to live in.” (interview comment, Paul Early)

Early also did a comparison with his neighbour who has a similar house and at the time they had very similar heating patterns. Early found that during a rather cold February – both houses were monitoring heating cycles as well and the temperatures within the living rooms – he was using about a third of the energy that his neighbour was using (interview comment, Paul Early). While Early was confident that they would “reduce the energy usage quite a lot” with the retrofit, it has been difficult to estimate how much energy they have actually saved as the way that Early uses the house has changed over the years – from initial two adults to a family (interview comment, Paul Early).

“When we did the renovation with two people, going to work every day. Now the house is occupied pretty much all the time, because we are now a family and there’s almost always somebody here. It’s quite a difficult thing to compare.” (interview comment, Paul Early)

Early and his family use the solar thermal system for domestic hot water and for around five months of the year, from May until September/October, all their water heating demands are met with solar (interview comment, Paul Early). In winter, the solar thermal system provides a reasonable addition to their hot water heating demand, and on *“some days, even in November, it might provide us with all our hot water needs”* (interview comment, Paul Early). However, soon Early found out that the wood burning stove was providing much of their domestic space heating needs, especially in a well-insulated house.

“We very quickly found that we didn’t really need to put the central heating on, because you would come in, make a fire. The fire would get hot and after two or three hours it would warm. Not only would the living room be warm but some of the heat would have gone round the house. We found that was sufficient. Then in the morning, because we changed the nature of the house from being a house that just poured heat out of cold walls. We’ve now got this reservoir of heat in the walls, and actually, you could come back in the morning and it was warm enough not to have to put the heating on for the half hour, or hour or so it took us to leave the house.” (interview comment, Paul Early).

The sufficient heating from the woodburning stove was a welcome, albeit an unexpected psychological benefit to Early as it showed how warm the house stayed even without the use of conventional central heating (interview comment, Paul Early). In July 2016, Early’s house was consuming around 2,260 kilowatt hours per year (kWh/y) of electricity and 5,200 kWh/y of gas, and the wood burner was using an additional 500-700 kilograms of dried wood each year (interview comment, Paul Early). In comparison, the average household energy consumption was 12,962 kWh for gas and 3,938 kWh for electricity in 2015¹⁰.

After having lived in the house for the first year, Early’s expectations were exceeded in relation to the *“comfort that we did enjoy and continue to enjoy today”* with the house having *“a nice, comfortable and even temperature”* throughout, which seems to be a common benefit from retrofits (interview comment, Paul Early).

“That’s quite a common theme in houses that have been renovated, or newbuilds. When you go to somebody’s house and it’s -2 outside, you go into the house its generally pretty

comfortable. It's quite an even temperature, in comparison to, say, my next-door neighbour where you'll be just subconsciously, you probably won't even articulate it, but you'll want to stay away from the outside walls." (interview comment, Paul Early).

5.2. Choice of materials

With the materials for the Wichelo Place retrofit, Early wanted to choose natural and low impact materials where possible. If Early was to do the project again, there are a few things he would consider doing differently, going *"down the passive house type of route"* and considering technologies such as triple glazing and mechanical heating and ventilation (interview comment, Paul Early). However, materials that he chose, like the limewash on the external wall in the front of the house *"has been reasonably robust"* and even though it needs redoing, it has *"lasted for eight years without having to have anything done, which is probably comparative to a painted finish"* (interview comment, Paul Early). Overall, Early completed his retrofit project at a time when certain materials were only starting to enter the UK market.

"The world was moving on as we were doing the project. When we started the project to when we ended, there were different products already on the market then. There are far more products now... Things like the external insulation, the stainless steel mesh for the render cost more than the render and the installation put together. It was horrible stuff to put on and now you can get products that already have your render mesh integral to the insulation." (interview comment, Paul Early).

5.3. Project management

Another learning for Early from the Wichelo Place project was the need for sufficient project management, especially in relation to ensuring adequate extra time in case of delays, and working closely with all parties to ensure smooth operation of the project.

"Because we were using different materials, there was a bit of a learning curve for the builders. There were always issues with supply. Some things were very easy to get hold of, other things, like the windows, they took longer to deliver. We knew we were going to have a bit of a delay, it was going to take a bit longer but we'd not built-in enough time." (interview comment, Paul Early)

If Early was to do a similar project again, he would ensure a list of long lead times and plan thoroughly timings for different deliveries (interview comment, Paul Early).

5.4. Sharing learning with local community

The Wichelo Place retrofit project has provided many learning opportunities, not only for Early but also for those who have visited the house as part of Eco Open Houses Brighton & Hove event. Eco Open Houses has been organised since 2008 by the Low Carbon Trust, Brighton Permaculture Trust, and Brighton and Hove City Council to showcase sustainable buildings across the city. Early has taken part in the event six times and initially got involved as he knew the organisers through his local networks. Opening the doors of Wichelo Place to the public between 2009 and 2015 has provided an opportunity to showcase all that Early has completed, and learnt, while doing the retrofit of his house.

“We’ve had hundreds of people come round over the last, I think we’ve probably done 5 or 6 out of 7, the last seven years. The discussion has swung round from people just being nosy, and just looking round people’s houses to quite thoughtful questions where they’re going to do their own project or maybe they’re already on with their projects and they’ve got similar houses.” (interview comment, Paul Early)

One learning that Early has been keen to share with others during the open days has been how retrofitting a home should be more than just about how much it costs and what the potential payback times are, and instead people should consider increased comfort and environmental benefit, something that are not easy to monetise (interview comment, Paul Early).

“What I say to people is that, “It’s a very narrow way of looking at life, financial payback. In fact, financial payback seems to me psychologically about not doing something, rather than doing something. Because you don’t pick your car, or most people don’t pick a car, on payback. They pick it by the way it drives, and the way they like the colour, they like the brand. It’s the same with houses, we do the same with houses. We like the house, we buy the house, we tend to put double glazing in because the people down the road put double glazing in.” That tends not to pay itself back either. That to me, is something that I always try to get over to people, that in terms of comfort payback, it’s really high. That’s something that you can’t easily put a price on. I’d like to think of it in the way that I’m getting comfort, and I’m doing less damage to the environment. I’m not actually paying a lot of money for it if I life

here the 20 years, and it's not costing huge amounts of money.” (interview comment, Paul Early)

Since 2013, Early has also been active in local Hanover Action¹¹ community group, which promotes sustainability via various activities such as film screenings, workshops and talks, much of which takes place in the local community centre, the Hanover Centre¹². Early has spoken about his retrofit experience at the Hanover Action events for example.

“I certainly know we’ve influenced people locally, in the way that they were going to do their project. Whether or not with actually inspired anybody to just go and do a project, I don’t know... I’ve certainly spoken about how and what and why we did, what we did when renovating the house.” (interview comment, Paul Early)

However, availability of funding is key for groups like Hanover Action but *“with the general environment at the moment, there’s just not a lot of grant money around”*, which is the case for local councils especially, while *“the government is rolling back on its environmental commitments”* (interview comment, Paul Early). Early has noticed that the environmental and sustainability agenda has *“cycles of keenness”* – for example he himself was quite involved last time it was peaking in the mid-2000s (interview comment, Paul Early).

“I’ve seen about three cycles of where I really think it’s all going to take off, and then it goes back down again. It feels, I might be wrong, but it feels like were going through the trough at the moment. Perhaps a new generation will be really keen, and push it forward again, you’ll see us go back up the other side. Go back to another peak again.” (interview comment, Paul Early)

In Early’s view this has not been helped by the fact that the UK hit a financial crisis in 2008 and *“environmental considerations were no longer at the forefront of policymakers”*, or on the minds of other people for that matter (interview comment). Early sees that retrofitting the UK housing stock should be a national priority, undertaken by local and national governments, with similarities to other national infrastructures such as the sewage or electricity systems, especially as getting people to retrofit their homes on their own can be a challenge (interview comment).

“It’s really a national and local governmental level of initiative. Similar to when we got rid of outside toilets or we introduced running water to houses, or we insisted on electricity provision to houses. Those initiatives took an awful lot of effort and money, in terms of regulatory powers and encouraging, and almost forcing people in some cases, to be part of it.” (interview comment, Paul Early).

However, at present the UK *“government is not leading by example”* (interview comment, Paul Early). While, communities like Hanover Action can *“keep the flame alive, it’s difficult for us to make the shift that’s needed, just through community action”* (interview comment, Paul Early). Large-scale retrofit projects such as Wichelo Place require financial support, especially if they were to be done at community scale.

“It takes really, really serious money and engagement with the community to make a big difference. Doing a bit of draught proofing and a bit of insulation is fine, but it’s only the first tentative steps. You really have to go quite a long way, in terms of renovation, before you’re going to really see a marked difference in energy performance. You’ve got to go a long way to do that and that costs a lot of money, and there’s a certain amount of disruption for the householder.” (interview comment, Paul Early)

Therefore, Early sees that for the time being, projects like Wichelo Place *“seem to be still stuck at the enthusiast level”* (interview comment, Paul Early), with people like Early driving them forward.

6. Summary

Inspired by interest in environmental issues and MSc studies at CAT, Early embarked on retrofitting his cold and damp Victorian house. Planning the retrofit project took around a year, which also gave Early an opportunity to live in the house before starting the project. Working closely with a local architect, whom Early had got to know through his ‘green’ networks, and a builder who was keen to learn sustainable retrofit methods, Early sourced natural and low impact materials to create a home that is both energy efficient and comfortable to live in. Keen to share his experience with others, Early has opened the doors to his home several times during Brighton & Hove’s Eco Open Houses event, and he

has been active in local community group Hanover Action, which aims to create a One Planet Living Community in Hanover.

Data Sources

The case study history is based on one digitally recorded and transcribed in-depth interview, carried out in person. It also draws on background material such as Eco Open Houses archives².

References

- ¹ BRE, Standard Assessment Procedure (SAP 2012): <https://www.bre.co.uk/sap2012/page.jsp?id=2759> [Accessed 30.08.2016]
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