

Episode 191

Key decisions that impact on the sustainability of a house build - with Lloyd Alter from Treehugger.com

The show notes: www.houseplanninghelp.com/191

Intro: Building your own home involves a myriad of decisions, but which ones are the most vital to consider when it comes to ensuring the sustainability of your house? Lloyd Alter has a wealth of experience in architecture, property development and environmental blogging and he returned to share his advice on what we should be prioritising as 21st century self-builders. I started by asking him what he had been up to, as he gets away quite a lot.

Lloyd: Oh, I do. It's a joy. I was just in Copenhagen at this wonderful design awards where they give the awards for sustainability.

This is the third time they've brought me over, every two years, and it's really a highlight because they treat me nicely and they show me wonderful things and I get to come to London afterwards.

Ben: When you do your travelling, I'm imagining you're picking up lots of things. I often see your tweets. What is it you like about Copenhagen?

Lloyd: The main reason I like it is that I've become really serious about low-energy transportation, about how good a bicycle is. Not just for getting around but how good it is for your health.

Where I live, in Toronto, they're putting in bike lanes and a lot of people my age who are not very fit, a little bit older perhaps, say 'you can't take out the parking spots. I can't walk that far. I need to park in front of a store.' And then you go to Copenhagen or Malmo and you see people of all ages walking around, you see them of all ages on their bicycles, you see them out there so much more fit.

I recently read a Guardian article where they mentioned that 50% of Britons over the age of 40 don't walk more than ten minutes consecutively in a month. Which means all they're doing is walking from their parking spot to their car and from their car to the office, and that's the only exercise that they get in a month.

This is something that we radically, radically that we have to change, or we're just going to be in a crisis. We're not going to be able to stay in our homes, we're not going to be able to get around, we're not going to be able to live.

There's a huge population boom that's getting older all at once that has to be dealt with.

Ben: I think today's discussion could go in a few directions. I'd like to centre it around my experience of going through the preparation for a house build and talking about some of the key decisions. Very specific things that can carry more weight than a lot of the other decisions.

We haven't fleshed this out fully and I'm just going to fire a few of these at you and we'll see where we go.

The first one being size, how important is that?

Lloyd: I think it's the single most important decision that has to be made. Everything relates to size. Obviously, the cost of the building is directly proportional to the size. So, the budget that you've got, the time you get to build, everything relates to the size.

There is another side to the size issue though that's really problematic. Once you find, for instance, with certain contractors, they don't want to get out of bed for a contract less than a million dollars or whatever. They've got a fixed income that they want to get.

So in fact, when you go to a builder and say, 'I want to build a hundred square metres,' you find that when it starts getting bigger, to 1,200 and 1,500 square metres, you've already paid for the bathroom, you've already paid the architect's fees, you've already paid for the kitchen. So you just think, 'it's just air that I'm really adding. So I can make it bigger.' So people do make it bigger.

I don't know if it's the same in Britain but in America, there's this disease I call 'squarefootitis', that everybody is obsessed with the cost per square foot. So, they look at houses and they say, 'wow, this house is only \$200 per square foot.' But the house is 50% bigger than the one that cost \$300 per square foot.

So people are buying more than they need, they're buying poor quality because they're using completely the wrong criterion to measure value. Price per square foot, or I guess in Britain, pounds per square metre – I'm not sure how you measure them these days – is not a criterion that's useful at all. In fact, it's dangerous.

The point is that it will cost you more per unit of area to build smaller but the aggregate, it will still cost you less. And when you factor in operating costs and maintenance costs, they are all going to be less with the smaller dwelling.

Ben: Here's an aspect for you. Again, it may change around the world. But I have discovered that actually, the size of the house is something that the piece of land dictates.

Lloyd: Well, yes. That is the case in many municipalities where there are zoning by-laws that militate against building small and efficient houses. Where I live, they have minimum square footages set in their by-laws because they want to get a minimum tax base which is based on the value of the building.

I've gone to the authorities saying, 'this is a summer place and they're only going to be using it and only want to build 90 square metres and the by-law says you have to have a minimum of a hundred square metres,' and they throw you out. They just don't want to know about this.

Everybody's so concerned about the tax assessment and the look and feel, that they say, 'that's too small.'

I think that's really problematic. I think minimum square area requirements should be illegal because people should be allowed to build as small as they want on a given property.

Ben: There's also the economics of it though, that if you do build small, you are taking the hit yourself because you're paying the money for the land – this is what I've found – and although I'm building a much smaller house than the land had permission for, I've got to make it the right value.

I've seen this before where people have built great houses and actually, they've lost money when they've come to sell them.

Lloyd: This is absolutely a factor as well.

First of all, when you buy the property, when you put in the services – I don't know if you have on-site septic or whether you're connected to the mains in the community – when you bring everything in, it costs the same whether it's a big house or a little house.

The house itself becomes a much smaller proportion of the overall cost of the project than you think it's going to be, and then when you do go to sell, what people care about is the house. They don't

care about how much the plumbing cost, how much the architect cost. So, you make a valid point that if you build too small, at some point down the road when you want to sell, there might well be a problem.

But as you've seen just in a house that you've shown me today in one of your wonderful videos, houses don't seem to last forever anymore either. Going around London and from most of what I see in North America, houses have almost become disposable. People are buying for the land and they want the latest new thing. It almost militates against building a really good quality house because they don't seem to be building them forever anymore.

Ben: Obviously, it's not going to be everywhere but it's the land that really has the value, not the building?

Lloyd: Yes. I would say so.

Ben: Interesting one. Closely tied into that is location. We've already mentioned Copenhagen and bicycles. But I tried to buy land in my town because I knew I had some great facilities there. It was just difficult.

A lot of the time, the few scraps of land that turned up either had thirty people putting in bids for it, including developers who could wade in with experience or perhaps they knew the people selling the land – you just never know – or redeveloping a house. It just didn't work out that way, that I got a piece in my local town. So, I've had to go further out into the countryside.

Lloyd: Unfortunately, I think this is universal in the self-build trade. Most of the land is controlled by developers, most of the land closer to towns is hugely expensive and everyone I know who's done it or when I practiced as an architect twenty years ago, it was always a case that unless you were extraordinarily wealthy, that's what you had to do to build your own house.

It's a contradiction. It's a problem. One of the greenest people I know, who runs a big, green website, Building Green, Alex Wilson, in Brattleboro, Vermont, ended up building his house nine kilometres away from the town. He said, 'this is way too far, I know. But I drive a Prius when I drive. My wife and I have got serious about cycling and we bicycle to town, even though it's nine kilometres, and we're very, very careful about our shopping, to make as few trips as we possibly can. We never order from Amazon and have their trucks coming all the way out from here and there.'

So, they've restyled their life to accept the fact that, 'yes, I know this was not what I should be doing, living out this far away, but I didn't have a choice. So, I'm going to do everything else I can to actually mitigate that.'

And building passive houses, as you are doing, is, of course, one of the best things you can do to mitigate your other energy hog things.

I lead a very green life. I bicycle everywhere, I keep my house at incredibly low temperatures, but every time I go to put something into a green calculator to figure out my footprint, I get just completely blown out of the water because I love travelling and coming to England and getting on aeroplanes.

I know absolutely that I should say, for living the kind of life that I want to live, I shouldn't be getting on aeroplanes, but we all have to make some compromises and exceptions and have dirty little green secrets.

Ben: What about slow travel? Isn't that a concept? Where you've come to London, you stay here for a year now.

Lloyd: Oh, yes. I've written about that. It would be absolutely wonderful.

Ben: It just doesn't work.

Lloyd: Yes. Well, it depends on your circumstances. I was in Copenhagen with a young man, Mike, who is the editor of a big, green website called Inhabitat. He's the editor-in-chief of it, but because it's an entirely internet-based business, he's come over, he's now going to go and sit on a beach in Portugal for the next month and write his website from there.

Being single and being flexible, he can do that. He in fact says he has his entire life in his backpack. That would be a nice, low impact way to go.

Slow travel is a wonderful idea. I wish I could do it.

Ben: Let's move on then. We'll get back to some of these key decisions. Are there any other key decisions that pop into your mind that are critical in a project build, that will affect the sustainability? I've got lots more if you want me to throw one in?

Lloyd: I was going to say something that you might have on the tip of your tongue.

I used to practice as an architect and it was hard. It was very hard to work with people, particularly couples, and get them to make decisions and to go in the right direction. I often thought, 'this is a terrible, terrible job. I don't want to be a marriage counsellor, I want to design houses.' But what I found is that in a sense, there has to be someone independent. There has to be someone with a base of knowledge.

I remember once going to a seminar with a brilliant Canadian writer who was hired to speak to a big architectural conference. Not about his house renovation but about some other technical thing. Of course, knowing he was talking to architects, he stood up and said, 'I'm so happy to be talking to architects. I just renovated my own house. I didn't use an architect. It was an old stone house in the countryside and I put seven inches of polyurethane foam on the inside wall', and everybody at the place just rolls their eyes because in the Canadian climate with really wide freeze-thaw cycles, if you put seven inches of polyurethane on the inside, the stone is never going to get warm, the moisture is going to get in and freeze and the house is going to crack apart. My next-door neighbour and expert on heritage buildings said, 'well, he's just destroyed that house.'

So for many different reasons, whether you've got the independent adjudicator working with families, whether you've got the technical expertise to do it right, whether you can plan it right, one of my by-words that I talk about all the time – in fact, my motto, if you look on TreeHugger – is that the key to sustainability is living with less and the key to living with less is to have it designed properly. If you have a crappy plan with millions of corridors, bends and wasted space and things like that, you're paying more for a poor living experience.

This is why I think an architect is so useful, in that they can help you get to the essentials and put the essentials together in the most efficient, satisfying and beautiful way, that most people can't do themselves.

Ben: This does fall onto my list in some way because this is just such a big decision, selecting that architect. Any tips on how you might do that, or a builder?

Lloyd: It's really, really hard. I don't know what to say.

I think it's easier than saying, 'I'm going to choose a kidney surgeon.' It's something that you can, as a layperson, judge. You can't go and say, 'he did a good job on that person's kidney' but you

can look at somebody else's house and say, 'I really like that house.'

Obviously, experience and looking at what they've done and whether you like what they've done is really important.

Of course, when I was a young, starving architect, I complained, 'no-one will give me a chance or an opportunity because I haven't done enough for them to see and judge. I want them just to trust me and give me a chance.' Which is why I think most architects end up designing houses for their parents. That's the only way that they actually get a start.

It's very hard but I think the two most important things are: 1) going to look at the work they've done; and 2) spending enough time talking with them and drinking coffee with them that you like them and you think they understand you. Because there are many architects that people go to because they say – it's the old Ayn Rand Howard Roark thing – 'I'm an architect, I'm a genius. You hire me and you get what I give you.' This is a very, very small proportion of architects but they exist.

The important thing, I think, is it's a subject where unlike the kidney doctor, you can do your homework, you can go and see what they've done, you can talk to them and you should be able to understand what they're saying. If you read architectural magazines, you can't understand a word that architects write because there's this whole architectese language that they use among themselves to impress. But when you're a client, you shouldn't have to deal with that. You should be able to understand what they're saying.

Ben: When I started my podcast, I set myself the challenge of building a house before I turned 40 in August 2016. I failed spectacularly having not even got a piece of land at that stage.

But on reflection, it was time all well spent. Luckily with the work I do, going out and filming, I've visited probably over a hundred different houses, I've bumped into these people at conferences, so that when I did get the land, things could just move quickly. I knew the people that I got on with, the designs that I liked, the quality of workmanship and all those sorts of things.

So, I do think if you're in that situation, it helps to just spend that time getting to know people. Open houses is another great one.

I've got a couple of other things on here. What do you think about simplicity? I've put a question mark next to this one. I find it very

difficult these days, having done all this learning over the last five years, to understand when things get too complicated. Maybe I'm just too into Passivhaus, but what are your thoughts on that?

Lloyd: This is a subject that I get worked up about.

A few years ago, in fact it's still going on, is this whole concept of the smart home, where people are putting solar panels on their roofs that are controlled by their Nest thermostats which talks to the furnace which comes on when it detects from your smartphone that you're a couple of blocks away. All of this complexity where your dishwasher is talking to your stove which is talking to your smartphone again. Houses get very complex. In The States, you can get smart vents because they have hopelessly bad forced air furnaces that drive air through noisy ducts, that close and open the ducts. All of this "smart home" is so popular.

My attitude is I like a dumb home. I've always been saying "in praise of the dumb home". I use the Passivhaus as a real example of a dumb home. A smart thermostat, for instance, goes on when people are coming home. It turns up the heat. It turns down the heat depending on the occupancy. It adjusts the heat. Because in a crappy home, the heat changes really quickly. In a Passivhaus, a smart thermostat would be bored stupid. It would have nothing to do because the house retains the same temperature inside thanks to all of the insulation. You don't need a smart thermostat. In most cases, you don't even need a thermostat. So, the house takes care of itself.

It's the same with complex systems like solar panels connected to the grid, going in, going out. Are you buying your power? Are you storing your power? To me, the answer again is the Passivhaus routine, which is to use less power. To not worry about how much electricity I'm getting from the solar panels but to think about how little electricity do I need at all.

When you look now at LED bulbs that use almost nothing, lighting load has ceased to be existing as a problem. In a Passivhaus, heating load is pretty negligible. So, what you've got then are really the things that you use yourself. Your stove, your fridge, your vacuum cleaner and your iron are the things that are using electricity and those are all things that don't need to be very smart. You turn them on when you need them, you turn them off when you don't.

Simplicity to me is one of the critical things that should be designed into the house in the first place.

There's a whole theory out there in open buildings, that things last different lengths of time, different periods. So your land will last forever; the frame of your house could last 500 years; the cladding, 200 years. But certain things like windows, it might be a hundred years; plumbing might be 50 years; electrical, 20 years, the technology changes; and mechanical systems may be as little as ten. So, houses have to be designed in a simple way that you can get at these things, that you can fix them to have as few systems as possible in your house at all.

I was looking at a house a few years ago and something that I think everyone should plan for now is to make sure that if you're building a house now, that your electric wiring is all accessible. Maybe you design it so that it all runs behind the baseboards. So that you can pull off the baseboards in ten years and replace the wiring. Because I guarantee you, the high voltage electric current that you're using now, with LEDs, your computers, your smartphone, everything running on low voltage DC wiring, in not too long, all our houses will be running on DC.

You have to think about these future changes and keep it all simple. Put as little of it as you need in. Because at some point, you're going to have to redo it anyway.

Ben: Lots of things that you've brought up in there. Let's touch on one first, while it's in my head, renewables.

Do we have a duty to generate on our schemes at the end? I know we've done all that stuff beforehand, haven't we? We've reduced all the energy we're going to need.

Lloyd: I think absolutely not. I think that it's fundamentally wrong to be saying that every person in Britain has to be generating their own electricity, because what it does is it disproportionately favours people who have nice, south-facing roofs.

It's not fair to people who live in multiple family housing, for instance, where the proportion of roof to the number of people below is much lower. There's not enough roof on a multiple family dwelling. If you build a really tiny house that's vertical, or again a multiple family house, it's not fair or reasonable. If you live with your cousin and you have six kids running around the house and your energy use is higher, it's not fair to them in a sense.

The key is to reduce our consumption as much as possible and to not favour those people who happen to have roofs on their houses

that face south and can generate this electricity and live in a part of the country that gets enough light.

What happens when we do this, when we try to have everybody self-reliant on electricity, is that they're getting their money back from the government and those feed-in tariffs that they still have, but the poor person who doesn't have the roof or can't afford the solar panels, they're going to be paying more for their electricity.

So, it's not fair to the people with less money when the whole thing is structured as, 'oh, I'm rich, I've got a solar panel on the roof.' Because somebody has to pay for the grid, somebody has to pay for the distribution system.

It's got to be fair and equitable for everyone. And what's fair and equitable for everyone is for everyone to be living in houses that are built to a higher standard and use less energy.

If you look at the amount of energy that's used for transportation, if you look at the amount of energy that's used for building roads and infrastructure for cars and you compare it to what we're saving by having people have a few solar panels on the roof, it's inconsequential. We should be going after the big things. And that's efficiency, not solar panels on the roofs.

Solar panels on the roofs also add complexity. They have problems of their own. A neighbour of mine who had solar panels on the roof had to bring in a whole truck with a crane and a guy and a basket to go on the top to remove all of their solar panels because squirrels had moved in underneath. Panels are sitting three inches above the roof, it was a perfect squirrel habitat. They ate through the shingles and got into the roof. I said, 'didn't anyone think about this?' What are we adding to our houses when we're doing this?

I get in a lot of trouble with this all the time because I say, 'no, net zero carbon is not a reasonable target.' I used to joke that I could make my tent zero carbon by putting enough solar panels on the roof. As long as I'm generating the energy, it's okay. Well, it's not okay. We have to use less, period. Even if we're trying to offset it with energy from sun or wind.

Ben: I feel we're getting close to wrapping things up. That was almost a good place to leave it, but I still have a couple of things that I want to mention that are on my list, the other being whatever build system you use to construct your house.

Are we at that stage where we're almost favouring some methods of building or will there always be a complete range? A bit like we

said about sometimes you want to fly, well sometimes you want to build in this particular way.

Lloyd: I teach sustainable design at Ryerson University in Toronto, Canada. It's really hard because on a lot of courses, if you're teaching history or mathematics and that, it doesn't change that quickly. Things change over time, but in the sustainable design building, it can change every year.

Ten years ago, I would be talking about insulate, insulate, insulate and I loved foam. I loved spray foam that you put in and it seals it. It's great and isn't this wonderful? You get such good efficiency. Of course, now we've learned what goes in to making foam, we've learned that it's full of flame retardants that are bad for us, that certain foams like polyisocyanurates actually don't work below three degrees Celsius, there's something in it and they said, 'oh, we didn't know that.' We've learned so much that now, the hot trend that everybody's doing is insulating with essentially shredded newspaper, the lowest carbon thing you can use.

I'm still not a hundred percent comfortable with cellulose insulation and prefer rockwool, but it's always evolving what it's going to be. So, I don't think you can say, 'this is the way to build, that's the way to build.' Some people like structural insulated panels and I say, 'you've got particle board that's glued to Styrofoam and that's your whole wall? What will that look like in 50 years?'

I worry about that. As an architect, I don't think my liability lasts that long but still, I worry about experimental techniques, new techniques, I've become very conservative as I've gotten older.

Ben: You've talked about thermal mass as well, in one of your posts that I read a while ago, which I think is another interesting point because I'm building with brick and block and I quite like this idea of having a little bit of thermal mass. I know you've had a complete turnaround in thoughts on that. So, I'm thinking that way and could be completely wrong.

Lloyd: I had a line that ten years ago I wrote in an article with the catchy headline, 'you don't need to go to church to celebrate mass', because I was just so into this idea that it would hold the heat in the day and release it at night. Which works fabulously if you live in the high Arizona desert, where it's hot in the day and it's cold in the night.

But when you get to a climate like the UK or Canada, where the temperature between night and day isn't that different, then you're

not getting those kinds of cycles where the thermal mass is as useful as it is in the south where people built out of adobe and now they might use that.

I worry with your brick and your concrete, about the carbon dioxide that goes into the mortar and the firing of the bricks and all of that, which is giving you a big carbon dioxide hit before you even start your construction, and I worry that if you're insulating on the inside, which I'm assuming you are?

Ben: It's a cavity.

Lloyd: So, you're insulating between the blocks. Well, I'd have to take a moment to think about the effect of the thermal mass there. In fact, I don't have any response at all to that situation.

I was going to say that if it's on the outside then I don't think the mass is doing anything, and if it's the inside with 200mm of cellulose insulation or whatever it is, it's not doing anything either. It's the insulation doing the work. If you put it in the middle, that's a whole other kettle of fish that I don't know the response to.

Ben: One more thing that I wanted to bring up, this is the importance of who is developing this project. For me, sustainability is a key driver but I'm not the only person in this. I have my wife, who is also a very good project manager and makes decisions very quickly and writes back emails before I can even get myself prepared.

So, I think that's an interesting one that a lot of people perhaps don't think about, that building as a couple, with some things I'm very pleased that I never said right at the beginning, 'I'm going to build the greatest house', because there have been a lot of things that have happened where I thought, given a bit more time, maybe I could've done better.

Lloyd: I think that the biggest problem with much of the sustainability movement – and that's a holdover from the hippy movement and the stuff that we were building back in the seventies – and for the early years of this sustainability movement starting, 10 or 15 years ago, is that a lot of people think that if you're going to be green, you have to suffer. That you have to give something up. So, your car's not going to go as fast or your shower heads are going to dribble a little bit of water instead of being a comfortable shower, or that it's going to be uncomfortable. All of these things.

I think that the movement has evolved enough that what we're selling now, what people should be selling, is it's not about energy

and it's not about carbon dioxide. Those are nice benefits. But what we're really looking for is comfort and happiness.

If you say, 'this house is going to be incredibly comfortable and even. You're going to be able to sit by the windows in any weather and enjoy them. When the electricity goes out, the house is going to be warm for a week and you're not going to have to worry about it', well, people who don't give any care at all about energy or carbon are going to say, 'well, that's a nice feature. I can live with that. I can accept that.' If you tell them that the air quality is going to be fantastic and they're not going to get asthma or hay fever because the filter and the simple air system is going to filter it all out and they're really going to be healthier because of it, no-one's going to say, 'no, I really want crappy air in my house', you know?

The problem with the movement is we were always selling self-righteousness and better-than-thou-ness, instead of saying, 'I want to be warm and comfortable and not have to worry about things.'

I think with any spouse, in any discussion, if you said, 'we're not doing this because I care about green, we're doing this because I want you to be happy and comfortable', it's an easy sell.

Ben: I think on our project at least, that's something that I'm hoping we have got right. It's a good conclusion.

Is there anything else that you feel, to round us off today on these discussions, major decisions during a project that impact on sustainability? We've covered a lot of ground.

Lloyd: Well, I think that things are going to be changing in the next few years in our society. We're going through a lot of political turmoil everywhere.

I think that a word that people really should think more about when they're doing these things is 'resilience'. What are you thinking about in terms of when the power goes out? How long will you comfortably last? Do you have room for some storage? I used to say do everything small, small, small, small, small, but perhaps there should be room for storage of water, of food, of things like that.

In difficult times, it's nice to think that your home is safe, secure and resilient. So, look at your plot if you're self-building. Make sure that it's high enough and not in the middle of a flood plain. Think about what you do when the electricity goes out. Think what you do if you have to bicycle to the nearest store to get a quart of milk, that you can actually do it. Because that's what a home is supposed to be. A

place of security and comfort. That's what we should all be striving for.

Ben: Lloyd, always fun to catch up with you. Thank you.