BUILDINGS

I am a retired architect and I have been reading each and every report from the CCC to see how my skills can support the initiative to change how we pollute the planet with particular reference to the built environment. The urgency is daunting but the impact of the information is not as yet understood by most people I meet.

The report Behaviour-change-public-engagement-and-Net-Zero-Imperial-College-London attends to this subject. But it does not covey the current chat outside the school gate or over coffee. Most people are concerned but simply do not think anything can be done because big business never changes so why should we. Any way they want to continue flying off on holidays to see the grandchildren on the other side of the world. When the scale of household impact is pointed out then they start to think. However, most people will only make big changes if they see that the Government, Business and other people are investing in the costs. No one really wants to invest fruitlessly.

I aim in this response to connect what I know already with what I have recently linked to and how we might get the public to react effectively.

I have also shared this need with several schools of architecture, FMB, LABC, none of whom have come back with any response [to me]; NFRC, Energy Saving Trust and the RIBA all have. The RIBA assure me that they are hot on this task to you. The Energy Saving Trust current action is relevant. The NFRC are analyzing the potential for roofs to support solar panels CEO James Talman is very keen to get the nations roofs into the mix and is very active.

The Government have been doing some very good work with the Homes Fit for Habitation Act and this will give a route to insist that no one should live in a slum. The Local Authorities are all setting up systems to get landowners to pay for the enforcement in the rented sector. The Act allows for future raising of standards and could be expanded to cover all dwellings so that at Sale or New Tenancy all building fabric achieves a minimum EPC rated C.

The first step in achieving the Future Homes Standards consultation closes on 7 February 2020 and in responding to that I foresee the uplifting in design skills in the building industry a real struggle – this is technical stuff. Clear standards need to be set and this is the mechanism to achieve it. I am very concerned that in the drive to cut Local Authority staff we have lost the key skills and independency of the Building Inspectors and this will make enforcement very difficult. In the past Building Inspectors and Fire Brigade Officers were a tapped source of "how to do it" for many architects and designers – like the planning officers also now deskilled and mostly gone – these experts who used to know a lot kept the system working responsibly and linked knowledge to all. Privatizing these roles is not for the public good – Grenfell Tower for example lacked scrutiny in specification and construction. Training skilled workers is led by course take up [income to the college] rather than need. Weymouth College no longer teaches bricklaying or painting and decorating because local builders will not pay for apprentices in these trades. Skills are being lost, we also need to plan for **new** skills.

The NHBC have launched their new Standards 2020 1st Jan 20. NHBC is a key "how to build guide" for most housebuilders as they need to secure the NHBC warranty to sell the houses.
http://www.nhbc.co.uk/Builders/ProductsandServices/TechZone/nhbcstandards/

This new document is poor in terms of working towards zero carbon as the superstructure chapters do not attend to the construction consequences of significant increased insulation; see Chapter 7.1.11 details which are full of thermal cold bridges, Chapter 6.8 building chimneys to burn carbon. Chapter 8.2 is guidance on meeting low or zero carbon; good points in 8.2.4 about acoustics, 8.2.5 maintenance, location and wind loading are identified. Chapter 8.3 MVHR not heat pumps; it is gratifying to read 8.3.4 Noise with attention to condensation. Build tight ventilate right is still the best quote.
NHBC Building for tomorrow [Bft] is 8 conferences Feb – March 2020 around the country advising on the future I quote:
" Full access to Bft 2020 content, - Low rise stream – Part L update, 'Rethinking Construction' with FIS and maximising MMC and quality, - High rise stream – fire resistance and fire stopping, successful concrete repair, cladded framed buildings with masonry"
There is no indication that the changes needed to achieve real zero carbon are really understood – i.e the removal of gas for heating and solid fuel chimneys let alone the move to hydrogen.

The bigger longer-term issue is to translate the real embodied energy in our built environment into our decision making. All this "zero talk" is rather superficial. The built environment is a long term sequester of energy and potential future carbon capture. The UK does not lead the way with timber products. Scotland has some timber frame manufacturing. The UK should plan its new forests for both habitat renewal and for engineered timber production so that for instance new replacement triple glazed windows are made in the UK from UK timber. Importing the necessary engineered timber products to reduce concrete in construction needs to aim to reduce transport by home growing what we can. Like a supermarket knows how the weekly shop pans out the building industry product merchants need to look at the products we need for the future and start buying from UK so we manufacturing what we need in the UK for the UK.

On the whole it is better pick to stop thinking new buildings and to repurpose our existing built fabric. Employ our embodied energy better rather than waste it. Stop urban sprawl and reinvent the city as a place to live well in the centers. Carbon Taxing and the true cost of raw materials and transport and waste responsibility need to be factored in. Designing out waste as an architect or specify, is part of the responsibility, for instance if you specify sheep's wool for insulation you can zero waste but ridged board insulation of extruded foam generate huge quantities of unusable off cuts.

A big drive to get buildings renovated would be to change VAT so its zero rated for renovations and 20% or higher for new build and workable routes to zero-rated loans and grants. Subsides need to be without traps to lock people in to remaining in a property if they need to move.

Dorset Council declared a Climate Emergency in May 2019 and publish the measures that have already been put in place https://www.dorsetcouncil.gov.uk/emergencies-severe-weather/climate-emergency/what-are-we-doing-already-to-fight-climate-change.aspx
https://www.dorsetcouncil.gov.uk/emergencies-severe-weather/climate-emergency/climate-change-eap-13-september-2019.pdf
this is how they are talking to the people of Dorset online and through a free home delivered newspaper https://www.dorsetcouncil.gov.uk/emergencies-severe-weather/climate-emergency/climate-emergency-workshop-17-october-2019.pdf and if everyone read all these links we would be really getting somewhere.

https://www.dorsetcouncil.gov.uk/emergencies-severe-weather/climate-emergency/how-you-can-help-fight-climate-change-right-now.aspx

Key issues I wish to focus on are:

1. **Practical improvements Tasks to upgrade domestic building fabric by controlling heat loss [the most effective first principle] from drafts and increased insulation.** Firstly, how to make sure all dwellings are EPC rated and all the public understand the effectiveness and relevance of this task? This a Government leadership issue with sign posts to funding timed after newly trained skilled construction workers are there ready.
Both Tasks done ignorantly will cause interstitial condensation and rot.
Your report by Element Energy "Analysis on abating direct emissions from 'hard to decarbonize' homes" is very theoretical and the on the ground translation by local construction [and heating/electrical contractors/issues see item 2] will be very slow.

   https://energysavingtrust.org.uk/ I have objected direct to the Energy Saving Trust about their glib online encouragement to increase insulation internally as it really is not that simple as cold zones between floors and wall abutments need to be insulated too. The Energy Saving Trust directed me to http://files.sitefusion.co.uk/webfusion58199/file/2015_bristolsolidwallinsulationguidance.pdf if you go to any of the construction pages you will see how much change and therefore cost in involved. And where to find a trustworthy skilled worker who are available to do this work? There is a real skill shortage and an unwillingness to even price as they are busy enough as it is. If a small builder takes time to cost the job it is time wasted as without subsidy the homeowner is really not going to be able to afford the work.

   http://www.zerocarbonhub.org/sites/default/files/resources/reports/Zero%20Carbon%20Hub%202015%20FINAL%20REV%202910_WEB.pdf is a very good sign post to how to tackle the reality of the builders skills with the common faults. Compare to the NHBC Standards illustrations you will note how basic the skills are. issues and a convenient link to potential financial support. The Zero Carbon Hub know how it is in the building trade – low attention to detail, an undertrained workforce and very poor clerk of works supervision. Actually, I don't think Clerk of Works is a job that exists anymore. Certainly, schools of architect do not provide the skills necessary and since my experience ongoing from the 1970's never had – we who worked on site learned it from the old boys by on the job training. There are not enough building surveyors to go around so home improvements are relying on Check a Trade. Small building contractors work mainly with home owners and they are often family businesses. Taking on young trainees happens but time and time again young people fail to thrive and leave for easier lives.

   Walk round UK towns and look at up at the buildings. Upgrading brick or stone faced beautiful solid wall buildings is not going to happen externally without changing our value of heritage. Even single glazed listed buildings can be improved but not by much. A big task and impossible without changing the appearance of most. City Center upper floors are simply rotting from lack of use and maintenance.

   It is noteworthy that housing associations have already audited their properties and sold off all the dwellings that will be difficult to upgrade under the Homes Fit for Habitation. Redundant building fabric is being left to rot. Pension Funds are selling off their high street portfolios. No one who needs a profit wants the burden.
Historically in the 1980's cities like Portsmouth achieved renovation of large numbers of

slum private dwellings by easy to access, inspected, improvement grants aimed at young people to do the work themselves and by this measure they got housed and on the "housing ladder". Italy was reported recently for selling property for 1 euro to reinvigorate towns. Spain has ghost towns and France has rotting Medieval centers like Billom.
Recent Government legislation has made a loop hole for developers to convert buildings to dwellings with reduced performance criteria. Some Councils are using heat sensitive cameras to detect people living in sheds and garages to take action. Money is corrupting the issue https://www.theguardian.com/cities/2019/dec/19/it-feels-almost-like-prison-the-developers-building-homes-with-no-natural-light No one should be allowed to build/occupy energy inferior dwellings.

Relaxation of the planning system with larger permitted development rights has allowed huge sheds to be built in gardens complete with heating and light and absolutely minimal insulation. Summer houses or " home office sheds" are profligate users of energy.

How many people live in Mobile Homes on residential caravan sites? How many caravan sites rent to holiday makers who heat happily their tins rooms, the holiday patios, the sky? Council Tax data may be a way to locate dwelling types and become a registration of EPC performance? A maximum carbon usage tariff could be a way to force change and limit profligate behavior?

Overall it is my view that most owner occupiers have already upgraded their buildings as far is easy – lofts are insulated and cavity walls are filled and drafts stopped. Most have double glazing. Really convincing links to grants and incentives need to be posted.

2. **Practical improvements Tasks to upgrade Commercial building fabric by controlling heat loss [the most effective first principle] from drafts and increased insulation.**
For too long the U values and thermal performance of buildings have been much lower and more lax for industrial and commercial buildings.
For the polluter to pay all buildings must have EPC rating, not just larger businesses. All building fabric should be fit for purpose if its heated for people to work in then raising to level C by a fixed date too.

3. **Changing domestic heating to non-carbon.** Both the afore mentioned CCC reports and the Net Zero Technical Report focus on provisions of heat pumps, shared or district heating systems and hydrogen for heating homes.
Future, yet to be built, homes can be designed to benefit from all the passive energy opportunities [solar PV generating and carbon sequestration by timber] so that electric as the only top up heating can be achieved. No gas for new homes is a given.

   But for the general public gas has been the cheaper solution and homes heat with gas. How to make change happen and how to make it affordable and practical?
   Imagine if there was a Government Act which stated all new petrol and diesel cars will not be sold after 2030 people would plan ahead and buy the alternative electric car so as not to waste their money. Gas boiler need replacing all to regularly so if by 2030 you know you will not be able to buy a new one you will plan now. Obviously, you will also know about the need to simultaneously improve the fabric of your home.

   I have researched and refreshed my knowledge of heat pumps. The issue which is pertinent is the suitability. AWHP do not provide sufficient to cancel a separate source to heat water

[electric emersion?]. AAHP and GSHP all work with fans and pumps. The Db rating is given for all these services but the realization of the noise of a fan running is not often appreciated until it's there. Neighbors fans can drive you crazy. Vaillant Service confirm that the noise levels of the 15kw aroTHERM heat pump has a maximum noise output level of 65dB. An IKEA washing machine A+++ rated has a 54dB rating– this is something we can relate to and imagine sleeping with. A 10dB change is twice as loud. If background noise levels drop with electric cars etc then these fan noises with be a mental health issue. Located in a courtyard with multiple neighbours they will be a cause of trouble and distress.
Ground source heat pumps need access to suitable land to lay the heat exchangers. I had a vivid experience of a purveyor of ground source heat pumps manging to turn his ground into permafrost and never wanted to install such a system for my clients.

District heating to multiple dwellings ties people and purchasing together and it proves very difficult to control for comfort and finance/bill/future maintenance costs. British people like to be independent and never to be locked in financially. The U Switch competition has empowerment which most would never want to lose.
Building any new air polluting CO_2 emitting powerplant waste incinerators should be stopped and the ones functioning should be phased out. At least Landfill is a visible reason to cut down waste. Better bales of waste sitting in piles to be seen. Landfill can be controlled to tap methane and is carbon sequestration with the potential for remining in the future. This form of district heating is green wash and not to be tolerated.
Manufacturing should take responsibility for waste and move to a circular economy.

Hydrogen supplying to homes in place of Gas? All sounds very scary and how to convert?? I can't imagine it and I'm imaginative!

The only solution that works is to get so much electric produced renewably, with hydrogen as temporary storage to burn to generate for no renewable down time, that all homes can go electric [along with their car]. Safe, quiet and understandable. PV's will be erected by the able and pay-in tariffs need to encourage this. Every dwelling should get a capped supply at standard rate with a very expensive rate for the profligate. People will health issues could get a separate tariff.
I look forward to on-shore and off-shore wind turbines absolutely everywhere where there is wind with the only limit being noise disturbance to dwellings and land for growing food.

4. **Changing non domestic heating to non-carbon.** I see no reason why all of the built environment cannot be moved to non-carbon heating solutions so we need to work on the electric infrastructure.
If you ask an ecologist to support wind turbines, they reply "why not use of built environment to generate power?". I think we need all sources of power. With ample land for habitat to be secured.
The National Federation of Roofing Contractors CEO James Talman James Talman jct@nfrc.co.uk has instigated a review of a notional British city to see how many roofs are suitable to site PV panels or Solar Water heaters which can be extrapolated to access our capacity from urban roofs.
He also suggests freight transport lorry roofs for PV mounts. CCC already have the notion of EV being a storage capacity for the national grid. When vehicles are parked up they could plug in in locations sited for max sun. Anything and everything that can generate should be considered [criminal trade in PV might outstrip lead?]

Transport: Suggestions for policy changes

Public confidence is needed that electric vehicles are the way forward. This needs a realistic assessment of the supply of batteries. There is obviously a limited supply of Lithium in the world!!!! So if the public think it is pie in the sky they will not act. And if the role out charging points is not in place then they will not risk the change.

The SUV fashion has to be reversed.
SUV to have a very high road tax asap.
All domestic vehicles over 1.4litres to be phased out in 3 years.

All new diesel and petrol cars banned by 2030 or sooner.

All schools to register realistic and working green travel plans so that working parents can let their children walk to school safely. [in Glasgow very small children walk to school on their own!!]

Safe cycle routes – too many rural road don't have footpaths and are dangerous for cyclists.

Youth clubs need to run cycle maintenance programmes.

Waste – suggestions

Dog Waste and the waste route to disposal is complicated. I have tackled this with the Dorset Waste Partnership over a public route the Rodwell Trail where the littering is snack wrappers/drinks/dog. The response back so far has been:
<<I do have some further information regarding dog waste disposal and biodegradable bags from our commercial and waste strategy team which may be helpful.

They have said;

"Biodegradable bags are not helpful in this situation as a) they degrade (as you pointed out) so are not fit for purpose when containing unhygienic waste such as dog faeces, b) they are of no benefit to the environment in the context of the way they are disposed of (landfill or Mechanical Biological Treatment) and c) they are more expensive and more resource intensive to produce and purchase.

Litter bin and dog bin waste cannot go through an Anaerobic Digestion (AD) process as its inclusion would forfeit the PAS110 accreditation of the digestate they produce and also risk breach of their environmental permit in regards to emission of odour.

Even if the material could go through an AD plant, biodegradable bags are not compatible with that process and would be removed from the mix and disposed of as a contaminant.

As it stands the material from litter bins and dog waste bins goes through either landfill or an MBT plant depending on where the litter bins are located in the county.

If through MBT, the bag surrounding the waste would end up as part of a 'brick' that is then used to feed an energy from waste facility. The higher calorific content of the plastic bag makes it more desirable as a part of the fuel input than the biodegradable bag, which I believe is also more resource intensive to produce in the first place, so would have a negative environmental impact in this instance.

If sent to landfill, the absence of air (or low levels of) within it would mean the biodegradable bag emits methane, again making it environmentally less advantageous than the plastic bag in this environment." >>

To move dog waste to the organic recovery route the bio bags have to be compatible with the AD plants AND the accreditation and method needs to keep the route suitable to remove the odour problems. This must make more sense long term.

So we need:

1. better standardised biodegradable bags – even the household kitchen waste stream suffers from these.
2. All dog food manufacturers should be compelled to supply sufficient biodegradable dog poo bags for the food supplied
3. All plastic dog food bags to be stopped

ENERGY – EPC – rented accommodation

At a landlords meeting today I heard the complaint that if you take out a gas boiler and move to electric heating the EPC rating is negatively impacted.

So please get the EPC mechanism reviewed so that insulation and thermal performance of the fabric is the lead issue and electric is encouraged rather than new gas boilers being installed in existing properties.

INSHORE BRITISH WATERS

Portland Harbour and Weymouth Bay are very active marine environments busy with sailing events and leisure activities. Each time there is a national or international event the water fills up with sails in what might seem a low carbon activity. However each time there are attending safety boats rushing about all with huge petrol outboards motors. There is no appetite to move to electric outboard motors. Most of these events call for the boats to be trailered here from afar. A big shove is required for all our entire marine activity to take responsibility for emissions.

The marinas are full of petrol and diesel running engines sitting in the water with anti-fouled hulls.

The cargo ships that come in to bunker / off load cargo together with the cruise ships that arrive with ever more frequency all belch out fumes, wash out endless stream of water from bilges and are covered in antifouling on their hulls.

Shortly I will be anti-fouling my day sailing yacht will the most toxic of paint. This is probable my last year of sailing. When she comes ashore the toxic run off from removing this years coating washes through gravel but it is hardly a good solution. Portland Harbour has a floating testing rig for alternative anti-fouling materials we need to progress this research asap.