



SUSTAINABLE TRADITIONAL
BUILDINGS ALLIANCE

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A Response to HM Government's Heat and Buildings Strategy

The [Heat and Buildings Strategy](#) (BEIS Oct 2021) has been a long awaited one. Its title and importance had the sector waiting with bated breath to see what the direction of travel would be for the retrofit industry in the UK.

Maybe it is easier to start with the positives. The STBA welcomes much of the document, there is an absolute need to move towards a net zero carbon future and this does entail a lot of the work set out in the strategy. Heat pumps are, in the long term, the heat source of the future, and absolutely hydrogen (green) and bio-gas both have a large part to play in terms of alternative fuel sources. The planned efficiencies around consumables and the appreciation of the wider benefits to green jobs, fuel poverty, health and wellbeing etc are all good to see within the document. BEIS' priorities for energy efficiency for example are laudable as they wish to:

- *reduce upfront costs*
- *improve and develop retrofit solutions*
- *reduce the space requirements for energy efficiency solutions*
- *tackle the low levels of awareness*
- *improve financing options*

There also appear to be reassuring phrases used like '*no- and low-regrets' action'*', '*whole house approach'*', '*practical, cost-effective and affordable'*' and '*different approaches ..for different buildings'*'. These words give hope that a risk based whole house approach will be taken to enabling a net zero carbon future and that this '*fabric-first'*' approach, as per PAS2035, will be one of the key foci in the strategy.

Indeed, the Strategy includes a lot of justifiable statements and indeed some fine aims, to give some examples:

We have tailored our policy to drive and enable improvements across the UK building stock, including:

- *future-proofing new-builds*
- *upgrading housing*
- *trailblazing a whole-building approach for public sector buildings*
- *initiating a performance-based rating system to begin decarbonising large commercial and industrial buildings*

Improving energy performance is also an investment in health and wellbeing, as it leads to warmer, more comfortable buildings with better air quality, when paired with adequate ventilation. In the long-term, energy performance improvements also provide benefits such as increased productivity, longevity, and higher life satisfaction.

For domestic buildings, improving energy performance therefore supports the government's broader ambition of smarter, healthier, cleaner and greener homes. These ambitions are even more critical to achieve when increasing numbers of people are currently spending more time at home due to COVID-19. Reducing energy demand also helps to directly address fuel poverty by lowering energy costs for households.

So to a certain extent the Strategy has a lot of the right ideas at its heart, however there are some major concerns to this including its unerring ability to:

1. ignore the needs of 25% of the UK's housing stock,
2. use inappropriate energy focused definitions of well-known phrases,
3. show a lack of appreciation of the issues around retrofit,
4. rely on EPCs.

Overall, one is left with the feeling that there was a political driver behind this that finds reality a bit of a hindrance, so chooses to ignore this and plough on with 'big statements' at the expense of the truth.

The result is a narrow focus on heat pumps, heat networks, hydrogen etc and very little in terms of recognition of the works required in order for these options to be successful. It is well known in the industry that buildings cannot just have a heat pump installed without making the property 'ready' for the associated lower heat intensity of the system. This 'fabric first' requirement is touched upon, but in a really understated manner. It is almost as if there are several frustrated and knowledgeable civil servants, who understand the complexities of retrofit, who desperately wanted to ensure that there was something in the document that at least references issues around 'whole house approach', but that they were over-ruled / ignored by decision makers further up the command chain.

Without the detail on how one is going to arrive at the place where heat pumps can be widely installed, the whole document becomes relatively useless apart from for those businesses trying to sell them.

To take the STBA concerns in turn:

1. Needs of 25% of the UK's Housing Stock

The STBA was hoping that the document would focus on this 'enabling works' for a low carbon future, but it just glosses over this with nice generic words that are ill defined and unenforceable. For us, the real disappointment is the complete lack of the term 'traditional' in terms of construction type. There is one 'historic', a couple of 'hard to treats' and three 'worst performing buildings'. Even here 'hard to treat' refers to 'hard to heat' rather than treat, as the solution to them appears to be simple: use '*higher temperature heat pump systems, with 65°C flow temperature.*'. The 'worst performing buildings' are to be tackled by local governments using funding like ECO targeted at the

fuel poor. Even 'historic' is only used in reference to planning protections: *'there are many types of buildings within the UK, with different uses, owners, sizes, locations, fabric efficiencies and heat sources. The most effective way to decarbonise will be dependent on all of these factors. It will also depend on the building structure, and if there are any protections in place (historic or listed buildings).'*

For comparison there are 32 x 'Affordable', 104 'EPCs' and 319 'heat pumps'!

So 25% of the UK's stock, which is deemed by EPCs to be some of the worst performing, are not explicitly represented in the strategy at all. This is despite one reference that states *Buildings with poor thermal efficiency, where excess cold, dampness and mould growth are present, create significant direct (health and NHS treatment costs, higher energy bills) and indirect costs (opportunity costs, e.g., underperformance at school, lost working days, lost business opportunities, lost property value, lack of wellbeing)*, the specialised enabling works that will be required in order to adapt it to make it net zero carbon heating ready, is not explicitly represented in the strategy at all. This is essential if the fabric improvements are to keep up with, and in advance of, the heat pump roll-out.

2. Inappropriate energy focused definitions of well-known phrases

It might be expected that solace be found in some overarching tenets, like the encouraging terms used in the 5 'Core Principles' like *'no-and low-regrets action'*, *'whole house approach'*, and *'different approaches ..for different buildings'*. However, the reader is left stranded by their subsequent 'definitions'. The focus on these promising terms is almost completely focused on energy related factors rather than 'fabric first' approaches. For example *'We need to take a whole-buildings and whole-system approach to minimise costs of decarbonisation - We will consider the heating system in the context of what is most appropriate for the whole building, as well as considering local and regional suitability and how best to manage system-level impacts.'* So nothing here about PAS2035 and the true Whole House Approach to retrofit, just the 'costs of decarbonisation'. There are so many potential co-benefits to good retrofit, as set out in the STBA [Retrofit to Regeneration paper](#), that could have been addressed including the issues around embodied carbon.

There was a little more hope with the statement: *no- and low-regrets' action now - Prioritising action to: improve buildings with low energy performance and high-carbon emissions, futureproof new-builds to avoid the need for later retrofitting, adopt a fabric-first approach to improve building thermal efficiency, increase the performance of products and appliances, ensuring climate change resilience by mitigating risks of overheating and poor air quality, build the market by developing our technical expertise, growing the workforce, and expanding the UK's manufacturing capacity and capability.* The missing element is again how this will be achieved. No reference to PAS2035 is given in this 'policy approach'.

'Different approaches for different buildings' appears in the same policy approach section and states: *We will balance certainty and flexibility to provide both stability for investment and an enabling*

environment for different approaches to be taken to address different buildings - We will provide long-term signals to investment by setting requirements and embedding flexibility in how they are achieved, so businesses and the public can prepare to decarbonise in a way that suits them and maximise the opportunities this presents'. Again no reference to a standard that businesses can latch onto to achieve this policy aim. However, further reading of the document highlights that what BEIS considers to be the main 'differences between buildings' is based upon their:

- (Sector) Domestic / Non-domestic (commercial and industrial, and public sector)
- Ownership and tenure
- Size
- Proximity, density and location
- Heat sources and energy efficiency (based on EPC only)

So nothing in there about different property types requiring different approaches to enable different heat or fuel sources. So phrases like *'we need to build-in flexibility to allow for .. solutions tailored to building types'* becomes fairly meaningless in terms of preparing the actual stock for a net zero carbon future. A trick missed one thinks.

The 5 core principles therefore are not providing any sense of protection against high risk retrofit options being taken. The focus is really on decarbonisation of heat with little regard on how to enable this or to consider all the pillars of sustainability including culture.

3. Lack of appreciation of the issues around retrofit of traditional buildings

The risk levels are raised further for the traditionally built stock because the *common sense no- or low-regrets option* is to address the *'worst performing buildings'* first. So headlong into insulating the traditional stock then. The known moisture risks are therefore in for a field day, especially when realise that the strategy identifies the main risk to moisture as being *'wetter winters'*. Regional variations and the Wind driven rain index are side-lined as it states *'As the UK is effectively one climatic zone, .. buildings throughout the UK are impacted in similar ways by the climate. Affected buildings will therefore benefit from similar mitigations, such as double glazing and improved insulation alongside appropriate ventilation.'* Much of PAS2035 is built on the context of the buildings and this is nullified if we take this approach. Have the Government not read their own, and many others, reports on moisture risk and lessons from retrofits past?

The emphasis from this strategy appears to be based on the concept of *'whole-house energy performance'* rather than a ['whole house approach'](#) to retrofit. This is confirmed by the whole building approach given on p.75 *'Taking a whole-building approach:*

We will need a mix of efficient products, low-carbon sources of heat and electricity, and smart and flexible technologies to reduce peak energy demand and keep us on track for Net Zero. In some buildings smart technologies and flexible systems may be more cost-effective than some fabric efficiency improvements and may offer similar benefits (such as decreasing energy bills). Though the

specific technologies installed differ between buildings, given the diversity of the UK building stock (for example – those most suitable for a rural heritage property are likely to be different to those suitable for an urban low-rise 1950s flat), we maintain that most buildings will require a combination of energy efficiency improvements, a low-carbon source of heat and smart and flexible use of energy. In order to reduce the overall costs of heat decarbonisation, energy efficiency and flexibility improvements should be made prior to or alongside the installation of a low-carbon heating system, wherever possible.'

Whilst there is nothing ostensibly wrong with this, but there is a clear emphasis on technology (presumably the much talked about heat pumps) and it glosses over the complexities associated with fabric efficiency improvements. In fact the document goes on to naively state that there *'are many simple yet effective ways to insulate buildings, which can significantly reduce heat loss while lowering heating bills'*

The list of examples given Insulation options include:

- *Draught-proofing:*
- *Loft and floor insulation:*
- *Insulating heating systems:*
- *Insulating walls:*
 - *Cavity walls*
 - *Solid walls*
- *Windows and doors:*

Solid wall insulation is explained *'solid walls .. need to be insulated on the inside or the outside of the wall. Though this typically costs more than insulating cavity walls, it delivers bigger energy and bills savings, as more heat is lost through uninsulated solid walls.'*

Many civil servants in BEIS recognise that solid wall insulation is not that simple. In one example given within the strategy this was hinted at, but not explicitly stated. On p.37 it states whilst referring to number of potential 'green' jobs: *'One of our whole-house retrofit projects (WHR-104) is estimated to require the equivalent of over 50 FTE to retrofit 100 homes by March 2022. This covers a variety of specialisms, including project management, production and construction, as well as any ongoing maintenance needs.'*

Despite this printed example implicitly indicating that retrofit is labour intensive and complex and requires on-going maintenance, none of this is explored in the document. One telling statement, sums this up:

Improving the thermal performance of buildings before transitioning to low-carbon heating will further reduce energy demand. This is because, once the building is more energy efficient, a smaller heating system can be installed. This reduces operating costs and enables low temperature systems to operate more efficiently and effectively.

So it is all about cutting costs by putting in smaller heating systems with their associated lower operating expenses (assuming that electricity will reduce relatively in price in the longer term and that heat pumps will deliver their promised CoP figures)

4. EPC cost metrics rather than carbon ones.

The overwhelming driver / measure in the strategy remains the EPC and its associated MEEs. The targets are all based around EPC Bands by specific dates. This is because BEIS believe that *'this allows us to predict the energy a building will use, and the carbon it will emit. By setting minimum energy performance standards across tenures, and increasing these over time, we can improve building performance across the stock. For the longer-term we will consider whether, when and how to ensure that all homes meet a Net Zero minimum energy performance standard before 2050.'*

This is, of course, slightly caveated by the reliance on the 2020 EPC Action plan to deliver on the 35 actions required for an *accurate, reliable, and trusted EPC*.

So the strategy is based almost entirely on a monetary metric rather than a carbon one. How can we cut carbon and measure our effectiveness by using £. Surely it is time to use carbon metrics to measure carbon. The differences between the EER and EIR of the EPC is not explained at all during the document and so no-one is any wiser as to how this will work in practice. £ per kWh is unknown and unpredictable (the last few months have taught us that), whilst CO2 intensities have been mapped out with a large degree of certainty up to 2050.

The [STBA and wider industry know that EPCs are not an accurate measure](#) for individual properties and hence using them to make improvement plans for them is very risky (hence the emergence of PAS2035). So this brings into doubt the sensibility of using arbitrary 'standards' to underpin this strategy. It also brings up the welcome caveat for the industry where measures are allowed to be *'feasible, affordable, or cost-effective'*. This 'get out of jail free' card needs to be used appropriately and unfortunately there is no reliable measure for it as yet. EPC predicted savings are certainly not to be relied upon.

Conclusion

There are lots of great sounding and easy words to write in a strategy, but it needs to be set out how these will be achieved. The document has lots of pleasing statements and indeed aims, for example the statement that this strategy *'presents an opportunity to ensure our buildings provide healthy environments'*. This is true, we do have this opportunity, unfortunately this strategy does not tell us how the Government plans to guide the industry in how to get there. Without explicitly saying something like 'PAS2035 will be used as a process to ensure that all retrofits are completed in a risk managed manner to ensure that all appropriate properties are 'as good as they can be' and ready for a net zero carbon future. Once 'net zero carbon ready' they will be fuelled by a mix of renewable

energy predominately in the form of electricity delivered through heat pump technology, or via blended hydrogen and bio-gas’.

It is clear that the intention is get heat pump technology over the line and to grab some headlines rather than the actual approach that is needed, where we need to improve the stock first so that it is ready to take heat pumps. The burying the head in the sand approach where one assumes that the fabric first approach is an easy one, and that we just need to use EPCs to guide us there, is irresponsible and naïve. No doubt there must be BEIS civil servants who are scratching their heads as to how their department published this strategy.

If the government were serious about tackling the supposedly ‘hard to treat’ and the ‘worst performing’ buildings (according to their favoured EPC metric) they need to get serious about how we do in a risk managed manner. The STBA do have many of the answers here for the traditional stock, but Government appears to prefer listening to ‘industry’ rather than reason.

Until we, as a society; represented by our Government, start to address the real issues of net zero carbon by using carbon metrics and by learning the lessons of the past by embracing wider sustainability factors we shall fail in our goal. We need Government show leadership in the climate change fight by focusing on carbon in all its’ forms not by fixating on industry profits and financial spreadsheet bottom lines.

The sustainability of the planet, the UK construction industry, the UK’s dwellings and all those that live in them is not going to be solved by deliberately vague strategies like this, even if they do have the right intentions. We need clear, unambiguous, structured and logical direction based on real world experiences and knowledge. This is an opportunity missed.

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November 2021