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## Consultation response

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25 August 2023

### A flexible Grid for the future

The UK Green Building Council is an industry network with a mission to radically improve the sustainability of the built environment by transforming the way it is planned, designed, constructed, maintained and operated. As a charity with over 700 member organisations, we span the entire sector from some of the largest property owners, managers and developers, manufacturers, multidisciplinary advisory and engineering firms, energy providers and distributors and banks through to public sector bodies including the NHS, MOD and many local authorities as well as many SMEs.

#### Background

This Energy Security and Net Zero (ESNZ) Select Committee inquiry is here to look at how the grid develops, whether there is a need for one size fits all solution or whether more local solutions might deliver quicker benefits. The inquiry is likely to touch on planning, devolution of decision making, the potential for new pricing that reflects more local solutions, and REMA.

The call for evidence - <https://committees.parliament.uk/work/7831/a-flexible-grid-for-the-future/>

#### Overview

UKGBC welcomes this inquiry from the ESNZ Select Committee. We also recognise the opportunity the Committee will have to integrate the findings of this Inquiry with the work the Committee has instigated to look at *'Heating our Homes'* and *'Keeping the power on: our future energy technology mix'*.

There is also scope to engage with the Environmental Audit Committee (EAC) on their emerging thinking from the two current Inquiries *'Enabling sustainable electrification of the UK economy'* and *'Heat resilience and sustainable cooling'*.

We intend to invite members of both Select Committees to an event in October to consider these issues in the round, and the systemic implications for homes, buildings and the whole energy system. Taken together they will inform the imminent and strategic choices the UK needs to make on the future of domestic energy supplies and technologies.

We note the need to mitigate emissions, eliminating and switching away from fossil fuel uses; to adapt to future needs, be they climate impacts, such as extreme weather; to reflect an increasingly digitised world and the associated expectations of smart technology; and to protect the UK economy from future global energy price shocks. Developing greater resilience is a common factor among these forces and drivers.

There is also a balance to be struck between how much of the solutions are led by user and domestic considerations, and how much by energy system considerations.

In the early 1970s the UK made a national decision to switch from town gas to 'natural' gas. This we could characterise as a system led choice, the availability of new and then cheaper fossil fuel supplies from the North Sea reinforcing a switch from 'town gas', it becoming more expensive to produce. The privatisations of the 1990s increased the relative importance of consumer choice, yet that constrained by a focus on choice within a retail energy market more than choices in domestic energy set-up.

This lack of choice in domestic energy set-up can be seen to be changing as EV penetration is giving home owners the opportunity to create home-based energy systems that support their EV, with a much cheaper running cost than public or third-party charging points, i.e. fitting domestic solar PV to capture electricity for self-supply, with smart controls and a battery to store the solar for overnight charging. In some cases, such set-ups can provide support to the local distribution grid, passively as they reduce peak and overall demand and actively when they export electricity. We note the current values for the Smart Export Guarantee (SEG) tend to incentivise self-supply over system support.

Of the existing 28-29m homes in the UK some 40%, ~10+m have off-street parking capability, supporting user led EV charging and self-supply – at scale this has significant potential to impact on overall and peak electricity demand, reducing the amount needed to be supplied by the grid.

This impact has in part been recognised by Ofgem and BEIS (as was) in the 2021 Smart System and Flexibility Plan 2.0, which highlights the £billions of potential savings to be made if the demand side of the energy system is flexible, to mirror the variability of the renewable supply side. While this requires a smart more digitally capable demand side it reduced the need for and cost of grid upgrades and lowers the peak generating capability needed at any one time, saving on generation costs.

Securing these cost savings and realising the potential of such a flexible, optimised energy system, requires smart, digitally capable homes with designed and built-in energy storage, integrated with appropriate home-based EV and solar technologies. What we do enable and thus lock in at the home and building scale in turn enables, or constrains, the ability of the wider system to be flexible, to be lower cost, and in turn to be less dependent on fossil fuels. This in turn frames both the future energy technology mix the UK will require, and the nature and capabilities of the grid going forward.

In the context of the Inquiries of the Select Committee we have therefore started with a consumer led lens, which in turns points to a homes and buildings starting point, i.e. this submission to the *A flexible Grid for the future* Inquiry follows on from our submissions to the *'Heating our homes'* Inquiry and the *'Keeping the power on: our future energy technology mix'* Inquiry response.

A customer, user led lens would ensure that homes and buildings are capable of supporting user needs today and into the future, noting mitigation, adaptation and digital forces and drivers above.

In adopting a consumer, user lens, our expectations of the (distribution) grid should be that it supports as much distributed and domestic flexibility as possible. Suitably rewarded this would also provide a consumer incentive to use energy more effectively and to potentially part fund other energy improvements.

A major opportunity to do this will be to **set a modern Standard for new build** that prompts design and build of smart energy capable homes and buildings. Such a standard would look to ensure thermal comfort (winter warmth, summer coolth), energy efficiency and capability, water efficiency, digital connectivity; with measurement, mitigation and minimum standards for embodied carbon. UKGBC's five tests for a net zero and climate resilient future Homes Standard can be accessed [here](#).

For developments of a large scale, we recommend they should be required to follow the dynamic thermal modelling approach (TM 59) which will help take into account overheating risk for a location.

While **existing homes and buildings** have been planned and built to different expectations of performance, reflecting expectations of stable weather patterns, evolving building technologies, designs, and planning policies, they will inherently underperform and be less resilient or adapted.

All future programmes to retrofit or upgrade homes should take account of location, ideally look to take an area based approach where possible (enhancing affordability and allowing scale solutions that suit the location) and ensure overheating is considered as part of a rounded approach to thermal comfort. This could form a part of local planning, be included in local area energy planning (LAEP).

To take into account individual home and building owner action overheating /thermal comfort should be included in building regulations and planning permissions for extensions and significant renovations.

The National Adaptation Plan (2023) should do more to take account of what is need for, and the potential of, adaptation measures for homes and buildings (<https://ukgbc.org/news/action-to-tackle-overheating-in-our-homes-is-largely-missing-from-the-national-adaptation-programme/>)

Key to greater resilience is the nature and function of the home, and those other buildings we use for offices, to provide public services and for in-door leisure activities. With today's understanding of the interaction between the fabric of a building and its environment, and of the ways in which homes and buildings place demands on utility infrastructures, it is possible to design and build for resilience in the face of expected climate impacts.

It is therefore essential that we urgently adapt and update our planning, development and building policies to reflect the capabilities that we want new buildings to have in the future. It is simply untenable that new homes and buildings could still be built to designs and with technologies from the 20<sup>th</sup> century.

In updating these policies, we can also release other benefits, including greater infrastructure resilience, local jobs, and improved quality of life; not least when recognising that no building is an island – each is part of a wider system of connected infrastructures that when well-planned can add value to each other.

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## Terms of reference questions

### 1. Does the current national and DNO grid deliver the capacity needed for the future and, if not, what are the solutions?

The size of grid needed will be driven in large part by the demand for heating and lighting buildings. On current trajectories, the grid will be significantly undersized and will be vastly expensive to extend to meet the needs of one of the oldest and most leaky building stocks in Europe. Perhaps the most important solution is to reduce demand from the existing and new building stock as the transition is made away from gas and oil heating, particularly at peak times of demand and lowest times of renewable energy generation.

This means introducing a national retrofit strategy to scale up public and private investment into energy efficiency. It also means that all new homes and buildings need to be built to genuinely modern standards. In energy terms this requires:

- due regard to siting and orientation of new build
- high energy performance standards, to include both energy use and energy capability. This would include
  - A thermal energy demand limit /cap
  - More effective fabric performance standards (and building control to ensure compliance)

- Inclusion of solar PV, battery storage and associated energy system controls to support flexibility

All of which is best supported by dynamic demand modelling. UKGBC supports the [Future Homes Hub's Contender Specification 4](#) alongside other measures to help deliver water security, manage climate impacts such as flooding, overheating. We believe this is the only Contender Specification capable of avoiding huge unnecessary grid costs over the coming years. It will also provide for local economic benefits in upgrade jobs, and energy returns to home and building owners.

Neither the regulatory regime for the grid, nor the DNOs fully recognise the potential of such homes, not what they can and should do to support them, not least because they will contribute to reduced constraint, and peak and overall demands seen by the system (As the Ofgem/BEIS Smart Systems and Flexibility Plan 2.0 highlights this could deliver billions of pounds of savings over the coming decades).

Such homes change the nature of what will be required from the DNOs. Many EV owners are moving to develop home solutions that include solar PV, storage and smart controls to support self-supply to their EV. Some 10+m homes (~40%) have off street parking that could support such innovation, of sufficient scale to change the macro picture of demand and capability required of distribution grids.

Work of the Active Building Centre Research Programme (White Paper, The role of active buildings in the transition to a net zero energy system<sup>1</sup>) highlights how widespread deployment of grid capable homes can enhance renewable penetration, save curtailment costs as well as reduce system costs for all, reflecting some of the Ofgem/BEIS analysis).

## 2. Has the organisation of the National Grid proved a barrier to the installation of renewable energy sources, and if so what could be done to remedy this?

Nothing to add here.

## 3. Should there be more innovation and devolution in the development of the Grid?

Yes, the ubiquity of renewables is driving decentralisation, while existing building stock varies regionally if not even more locally – greater devolution, such as Ofgem's proposed Regional Energy System Planner, as well as a formal adoption of Local Area Energy Planning will help optimise local solutions, making the most of local assets that may not be recognised or seen to add value when viewed at a national level.

While all homes and buildings have the potential to be energy assets, how they best do that will in part depend on local circumstances, for example buildings could offer EV charge points just to owners and occupiers, with an appropriate local arrangement they could also support public charging.

## 4. What changes should be made to the planning system to enable it to increase the use of renewable energy?

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<sup>1</sup> <https://abc-rp.com/wp-content/uploads/2020/11/Active-Building-Centre-Research-Programme-White-Paper-The-role-of-active-buildings-in-the-transition-to-a-net-zero-energy-system.pdf>

We would note that a key issue for the energy system transition has been, and to some extent continues to be, the lack of transparent and forward-facing energy system planning; over and above any issues of planning consents under the TCPA or NPPS regimes. Some areas are now grid constrained, e.g. west London for housing, following significant data centre development; an issue of an approach that is first come first served, and where DNOs have tended to avoid expenditure ahead of need.

Some changes are coming into play, DNOs moving to a first ready, first served, increased deployment of LAEPs – yet neither create a formal, transparent and engaging planning process for energy – which slows the ability of the grid to connect; and may affect how TPCA/NPPS planning process play out.

In those domains the Energy NPPSs need to be updated, while a modern future Home Standard would enable energy capable homes to come forward more immediately.

UKGBC is calling on the Government to align England’s planning system with the Climate Change and Environment Acts to give clear legal priority to decisions necessary to meet those commitments. This would end the inconsistency, barriers and delays to strategically critical low-carbon infrastructure including grid development. The Government has a major opportunity to do this through the Levelling Up and Regeneration Bill currently in its final stages in Parliament.

## **5. Is our planning system able to deliver more rapid development of new local infrastructure?**

See above, energy needs an energy system planning process to be in place before RII03 (~2026/8) to ensure business plans and licence conditions enable the necessary infrastructure.

## **6. Would regional, or nodal, pricing of energy facilitate a more flexible development of Grid infrastructure?**

Not in the absence of a regulated energy planning process; risks driving a different form of reactive grid response. It could inform an energy planning process.

## **7. What can be usefully learned from power transmission systems in other countries?**

Nothing to add here.

**For further information, please contact Louise Hutchins, Head of Policy and Public Affairs at [Louise.Hutchins@ukgbc.org](mailto:Louise.Hutchins@ukgbc.org)**