



# FUTURE READY HOMES

12 things our homes need for net zero strategies to be achievable



# 12 THINGS OUR HOMES NEED FOR NET ZERO STRATEGIES TO BE ACHIEVABLE

This paper sets out 12 practical actions that need to be at the centre of Government strategies for heat decarbonisation, electrification and home energy efficiency for a practical, 'no-regrets' pathway to net zero. The key is to make our homes ready for the future so that they can connect to, and benefit from, the new energy infrastructure.

The UK has just 30 years to meet its target of net zero emissions by 2050. Over that period, 28 million existing homes, plus millions of new build homes will need to be ready to use energy in a very different way.

Our homes need to be:

READY FOR LOW  
CARBON HEATING

READY FOR  
ELECTRIFICATION

READY TO CONTRIBUTE  
TO GRID FLEXIBILITY



Essential activity to insulate and improve the energy efficiency of homes is already underway, but wider improvements are needed. Homes will still use energy in 2050, yet much of the infrastructure needed for a low carbon energy system – such as a hydrogen network and a flexible electricity grid – may not be ready for years or even decades.

Time is not on our side. As the future energy infrastructure emerges, our homes must be ready to connect to it. This paper shows how we can make our homes ready, through actions that will also deliver benefits in the short term, making homes more efficient, more liveable, and cheaper to maintain.





# HOMES READY FOR LOW CARBON HEATING

Nearly 90% of UK homes have a 'wet' heating system<sup>1</sup> where heat is distributed by pipes and radiators. These systems can be used by either hydrogen boilers or heat pumps.

System enhancements are needed for these low carbon heating technologies, and these same changes will provide immediate energy saving benefits.



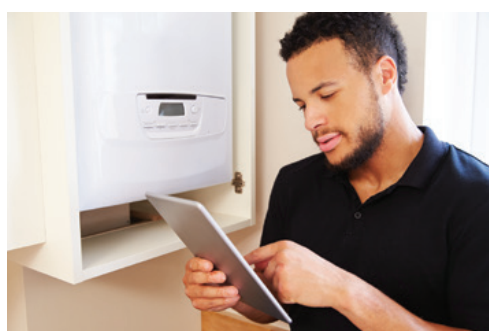
## Best practice heating controls

- The efficiency of current heating systems can be increased significantly.
- Less wasted heat means less heating infrastructure is needed.
- Future low carbon heating appliances require optimal systems.



## Heat emitters upgraded for low temperature operation

- Larger radiators or underfloor heating mean lower running costs now and in the future.
- Older radiators tend to be less efficient.
- The cost of future heat pump installations will be reduced.



## Correctly designed heating systems

- Properly sized boiler replacements and emitters ensure system efficiency now.
- Sizing information will help future low carbon heating choices.



## A rethink of hot water provision

- Hot water cylinders are rapidly being removed from homes without considering longer term needs.
- Hot water storage is needed for heat pumps and offers the potential for renewable hot water and thermal energy storage.

<sup>1</sup> Data extrapolated from English Housing Survey 2017-2018, Scottish House Condition Survey 2017, Wales Housing Condition Survey 2017-2018, and Northern Ireland Housing Condition Survey 2016.

# HOMES READY FOR ELECTRIFICATION

Electrification of heat is a major part of the solution to achieve decarbonisation.

To manage this objective there needs to be a parallel consideration of the effects of subjecting increased electrical loads upon the existing electrical distribution systems in residential properties. Upgrading the current electrical distribution system in properties will support the introduction of technologies to ensure safe installations and make buildings more energy efficient.



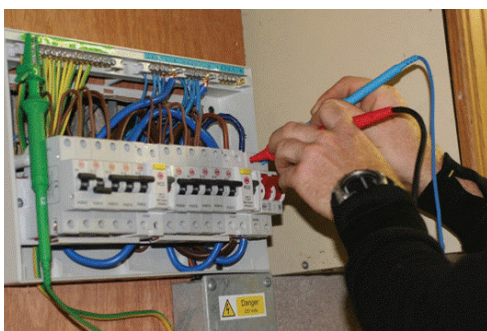
## Mandatory electrical safety inspections

- Make sure homes are ready for changing electrification needs.
- Reduce current and future fire risk.



## Consider three phase electrical supplies to new homes

- Develop a rapid charging infrastructure for electric vehicles.
- Enhance suitability for heat pumps and other electrification.



## Consumer units upgraded to a 'Domestic Energy Centre'

- Facilitate homes with renewable generation, battery energy storage, electric vehicle charging, increased levels of home automation and surplus electrical energy flowing into the grid.
- Ensure extra connection points and the associated circuit protection to accommodate the new functions.



## Accelerated heat pump installations in suitable homes

- Drive standards and consumer acceptance.
- Raise awareness of the beginning of heat decarbonisation.
- Develop skills and technologies for hybrid applications.
- Define opportunities for efficient electric heating in highly insulated homes.

# HOMES READY TO CONTRIBUTE TO GRID FLEXIBILITY

From 2020 there will be a growing number of domestic flexibility marketplaces, emerging particularly in places of high grid constraint.

Smart technologies that offer this domestic flexibility will enable increased penetration and utilisation of low carbon power generating sources. We need to ensure that homes are ready to offer this flexibility through deployment of prime enabling technologies.



## More homes with broadband WiFi

- Empower more households to access the benefits of smart technology and system flexibility services.
- Ensure that less advantaged households, including the fuel poor, don't miss out.



## SMETS 2 meters plus in-home displays fully rolled out

- Clearer communication to consumers and better targeted solutions and services.
- Unlock the potential for domestic, distributed flexibility.



## In-home or local energy storage capability

- Enable homes to use smart tariffs and participate at scale in the flexibility market.
- Engage consumers in using and providing flexibility from and to the grid.
- Enhance connections to on-site or local renewable energy generation.



## EV charging as a natural part of the home system

- Install private EV charge points in homes where possible.
- Increase the rate of installing public charge points on streets, in hubs and at destinations.



# OTHER ELEMENTS OF FUTURE READY HOMES

Net Zero is not the only reason to make significant upgrades and changes to UK homes. Consistently applying the solutions listed above will benefit the health and wellbeing of the people who live in them and will enable other products and services that will improve lives.

The elements below are a reminder of other principles that should be reflected in policy as we accelerate towards energy efficiency, heat and transport decarbonisation, and grid flexibility.

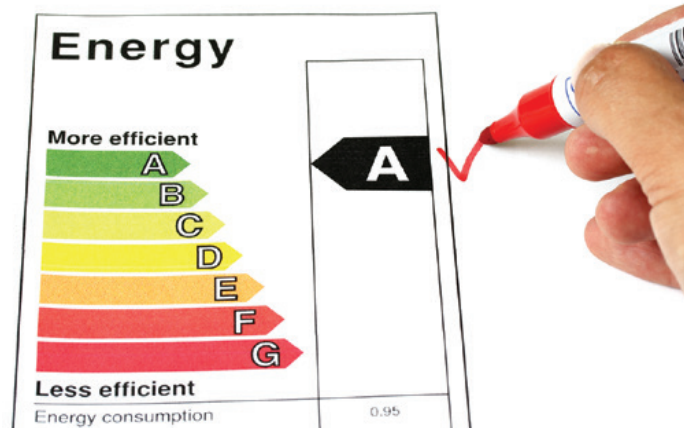
## Make homes healthy and safe

- Develop plans for retrofitting that take a holistic approach to maximising health and wellbeing.
- Continue to improve regulatory standards for ventilation to ensure that homes have good indoor air quality.



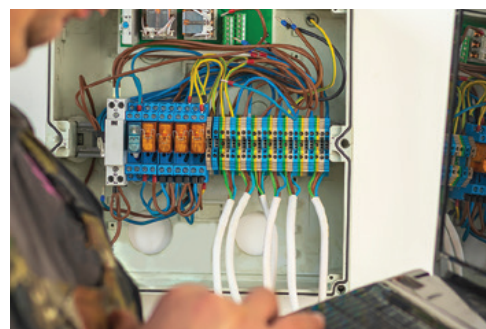
## Prioritise all energy saving measures

- Ensure consistent compliance with and enforcement of the regulatory requirements that contribute to efficiency (e.g. balancing and water treatment of heating systems).
- Require heat recovery wherever possible (e.g. for ventilation and hot water).
- Provide a clear path for the incorporation of innovative energy saving technologies into regulation.
- Ensure that product standards and requirements drive consumers towards efficient and truly smart products.



## Help installers on this journey

- Skills need to reflect new technologies and their integration.
- The context for developing skills needs to be broadened beyond, for example, a traditional heating installer role.
- The need for skills can become a huge opportunity for long term 'green jobs.'





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