



Committee on
Climate Change

Independent advice to government
on building a low-carbon economy
and preparing for climate change

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UK housing: fit for the future?

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Contents

- CCC housing report
- Current state of UK homes
- Research projects
- Report conclusions and recommendations

The UK Climate Change Act 2008

Mitigation:

- Legal target to reduce UK greenhouse gas emissions by 80% from 1990 levels by 2050
- Requires Government to set carbon budgets as a pathway to get to the 2050 target (five so far, up to 2032).

Adaptation

- Requirement for Government to publish a UK climate change risk assessment every five years
- And then a National Adaptation Programme that addresses the risks

The Act also set up the Committee on Climate Change and its Adaptation Committee.

- The Mitigation Committee advises the government on what each carbon budget should be, and scrutinises progress on meeting the 2050 target.
- The Adaptation Committee gives advice to the Government on the Climate Change Risk Assessment, and scrutinises progress of the National Adaptation Programme.

The Adaptation Committee of the Committee on Climate Change

Statutory roles in the 2008 Climate Act:

- **To provide independent, expert advice** on the UK climate change risk assessment (advisory role)
- **To report to Parliament on progress** with implementation of the NAP (England only - scrutiny role)



Baroness Brown
of Cambridge
(chair)

Prof Mike
Davies



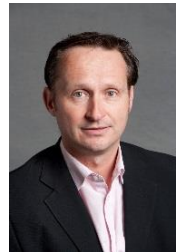
Ece
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Prof Richard
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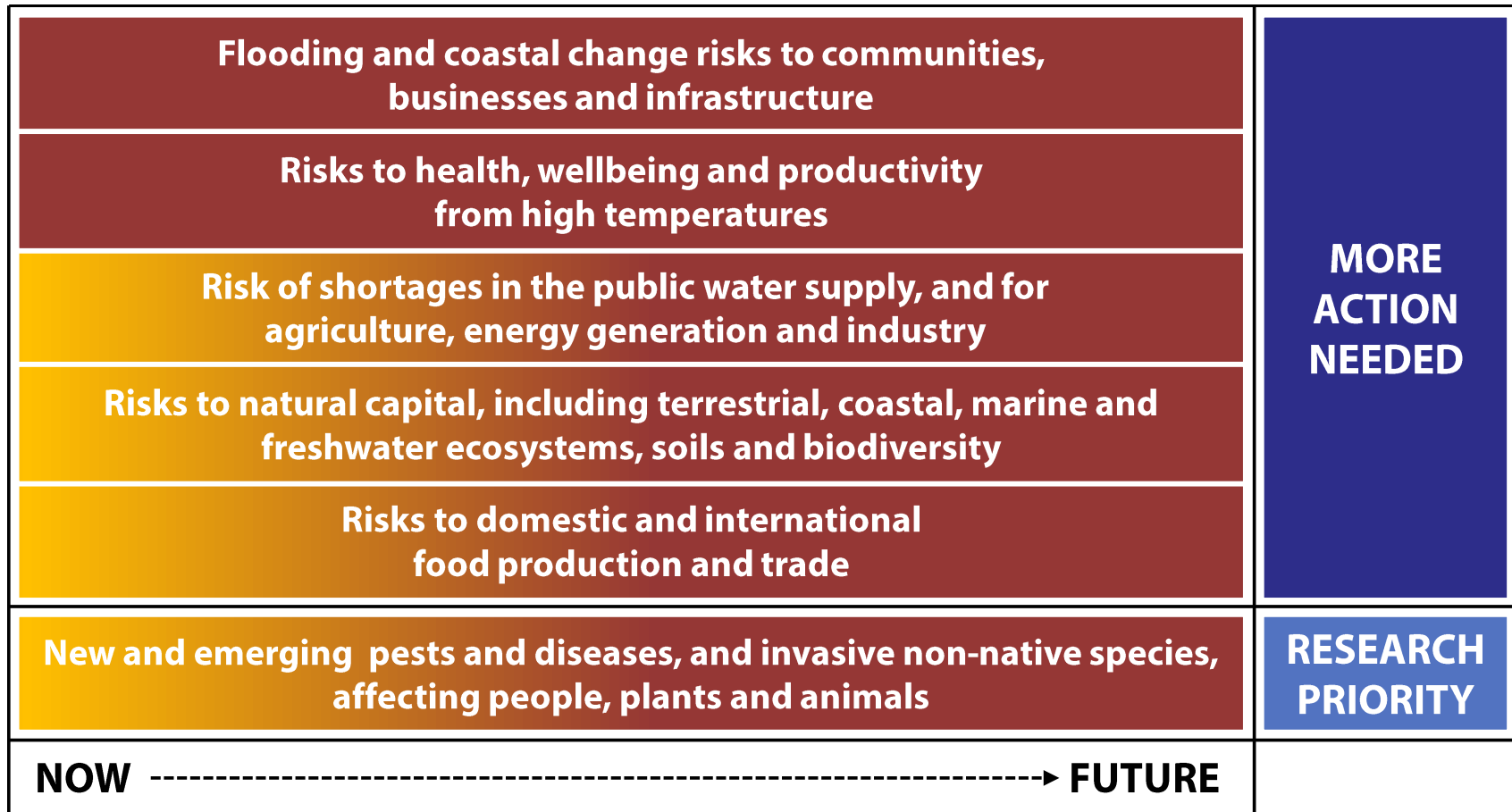
Prof Dame
Georgina Mace

Rosalyn
Schofield



Why a report on homes and climate change?

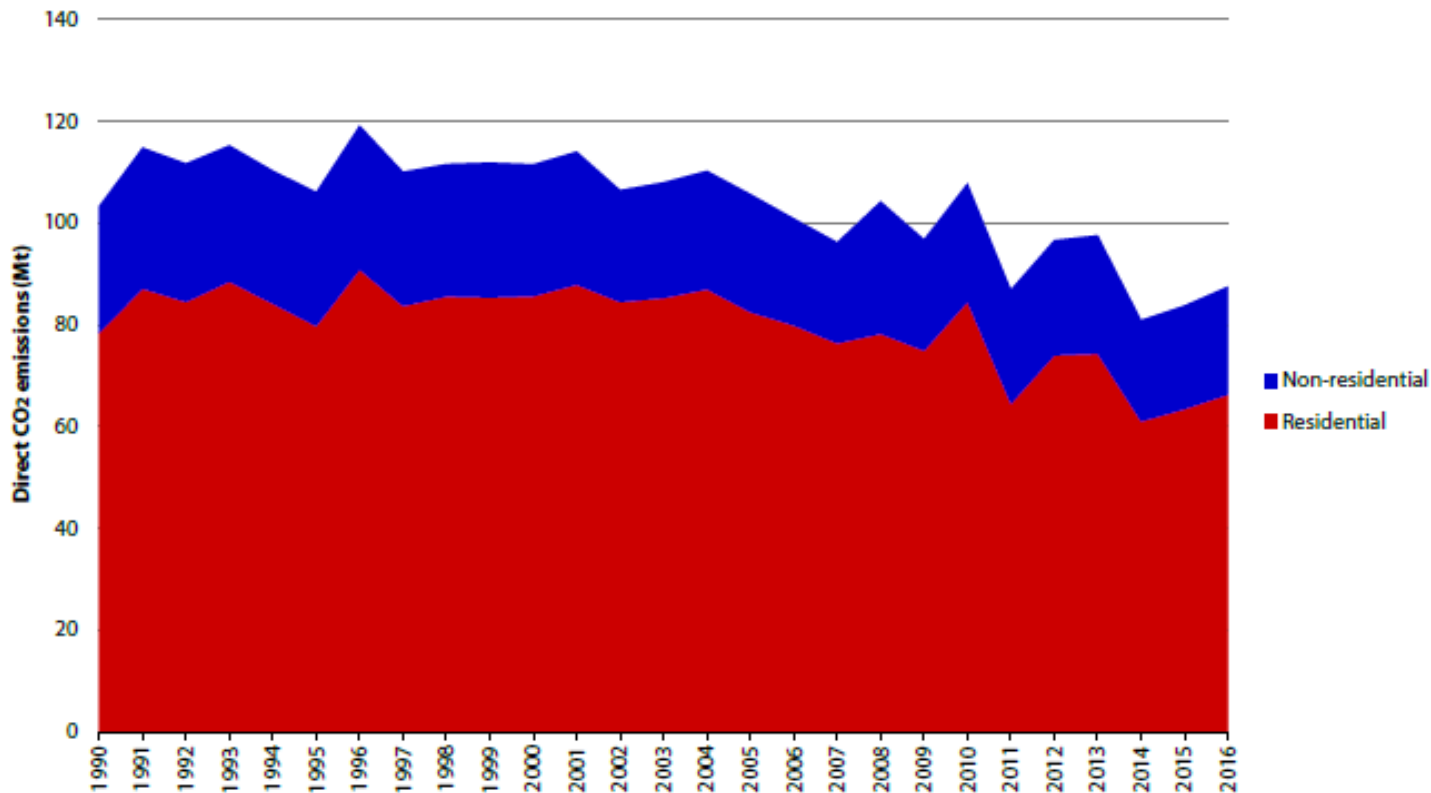
Top key climate change risks facing UK are related to housing



RISK MAGNITUDE: **LOW** **MEDIUM** **HIGH**

Why a report on homes and climate change?

Greenhouse gas emissions from UK housing are not falling fast enough



Direct CO2 emissions increased for the second year running in 2016. Adjusting for annual variations in winter temperatures, emissions rose by around 2% (CCC 2017 – Progress Report to Parliament)

UK housing: fit for the future?

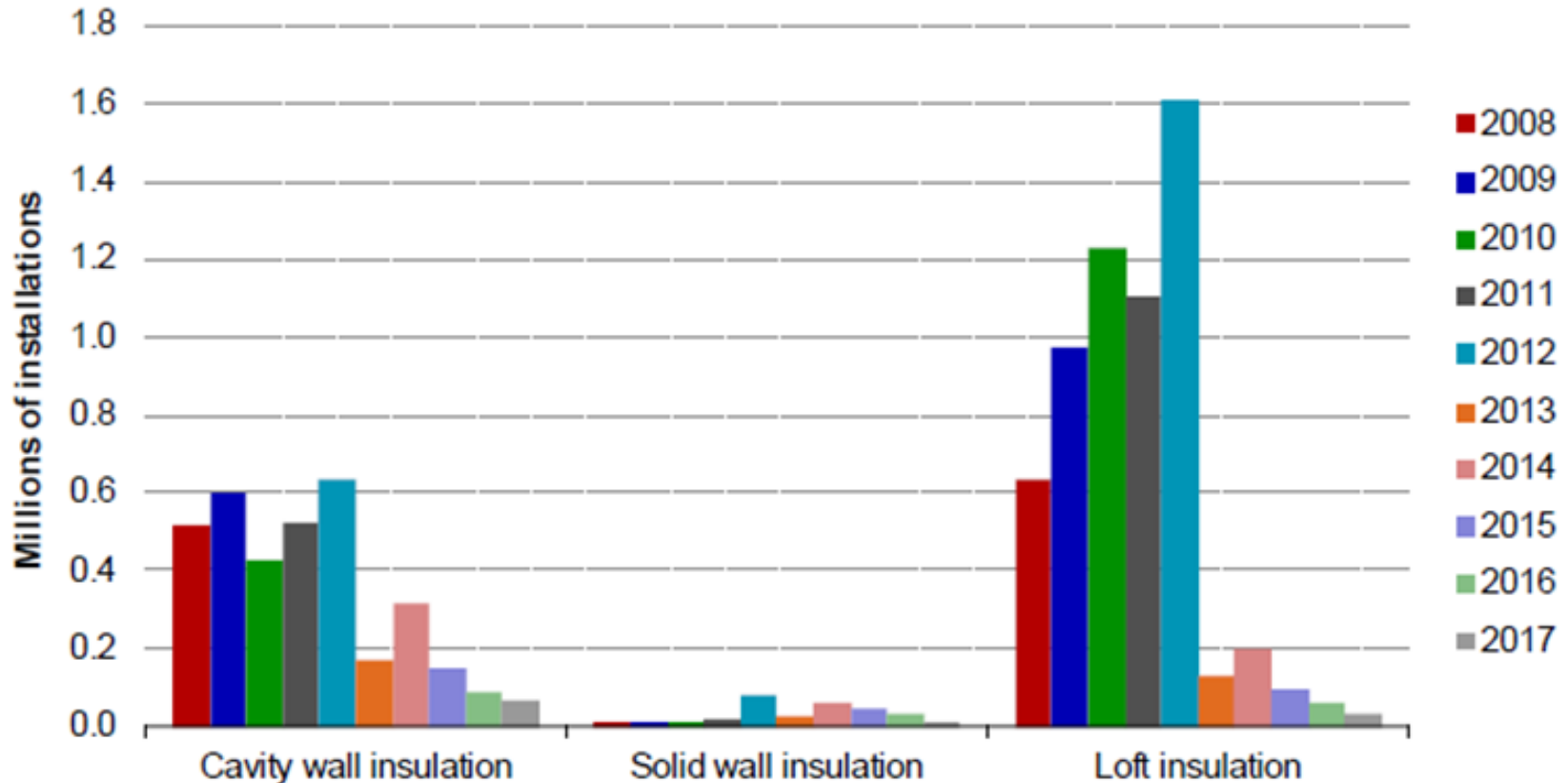
Published 21 February



- UK wide - joint mitigation and adaptation
- Assesses current state of UK housing (30 million homes)
- Identifies barriers and gaps to effective mitigation and adaptation action
- Recommends where improvements are needed – to support climate objectives *and* improve health and wellbeing

State of UK homes – issues

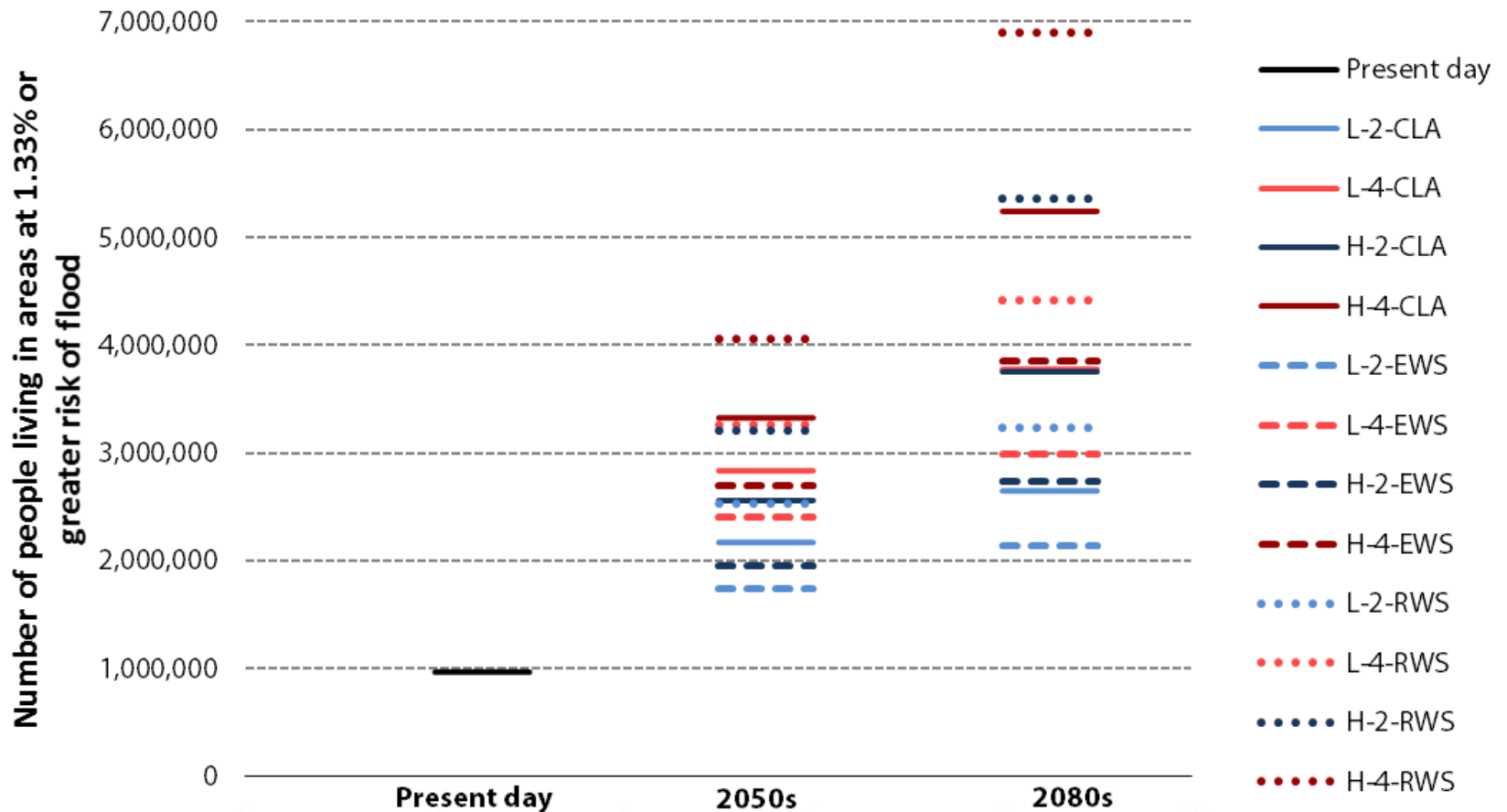
Energy efficiency improvements have stalled and uptake of low carbon heat is low



Annual installation rates of loft insulation, cavity wall insulation and solid wall insulation (2008-2017)

Homes aren't adapted to rising climate risks such as... flooding

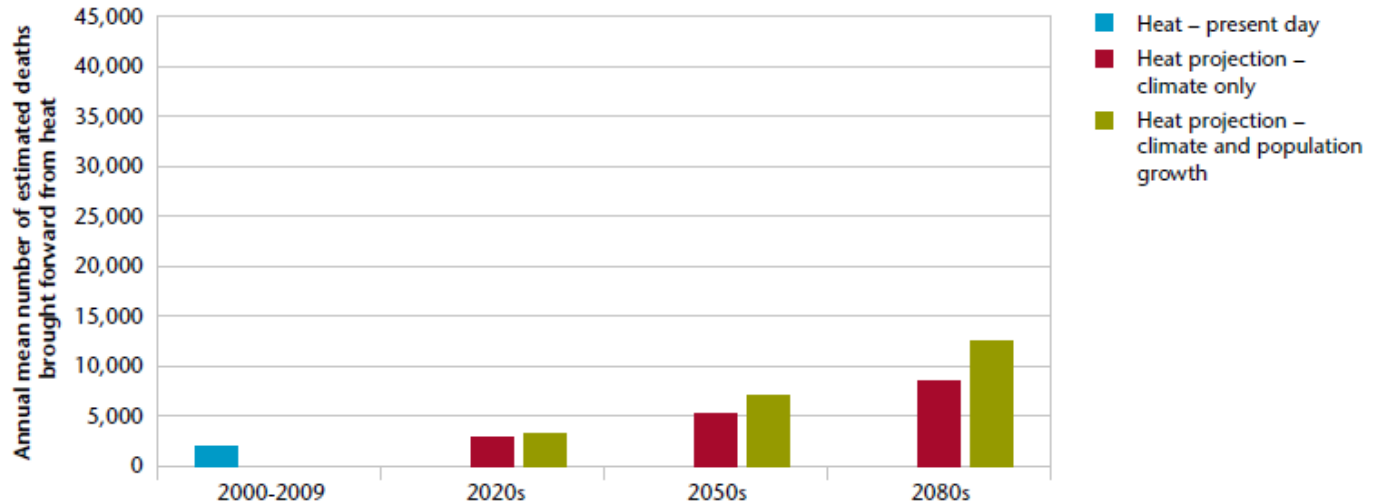
Not cost-effective to build community flood alleviation schemes to protect all properties at risk



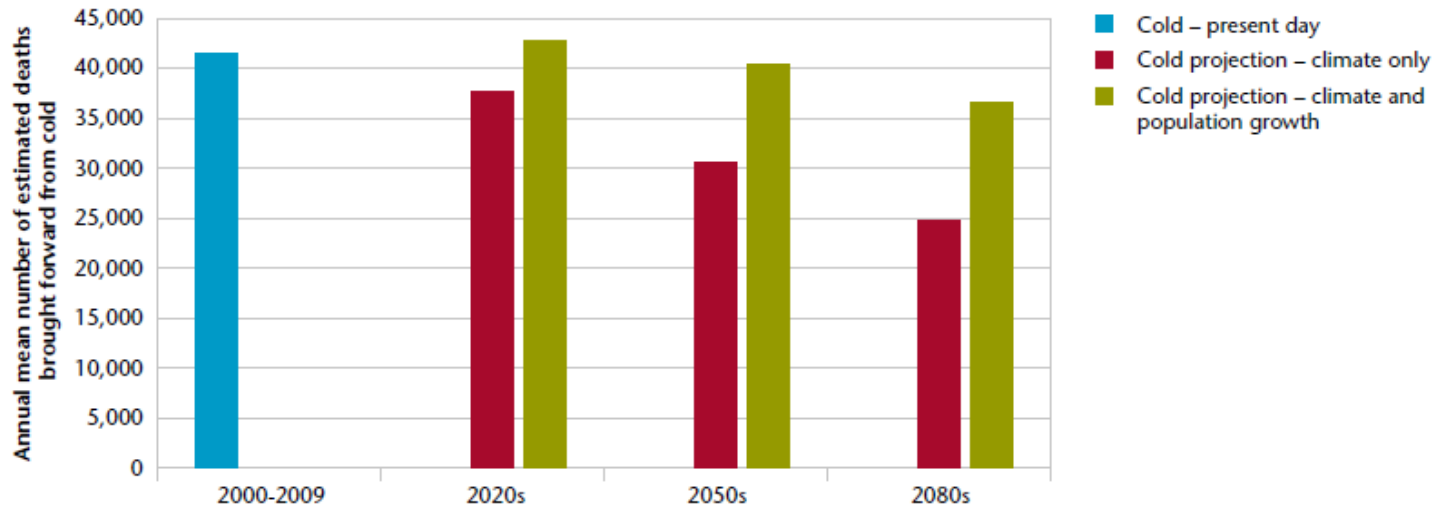
20% of
current
homes
overheat

All new
build
homes at
risk

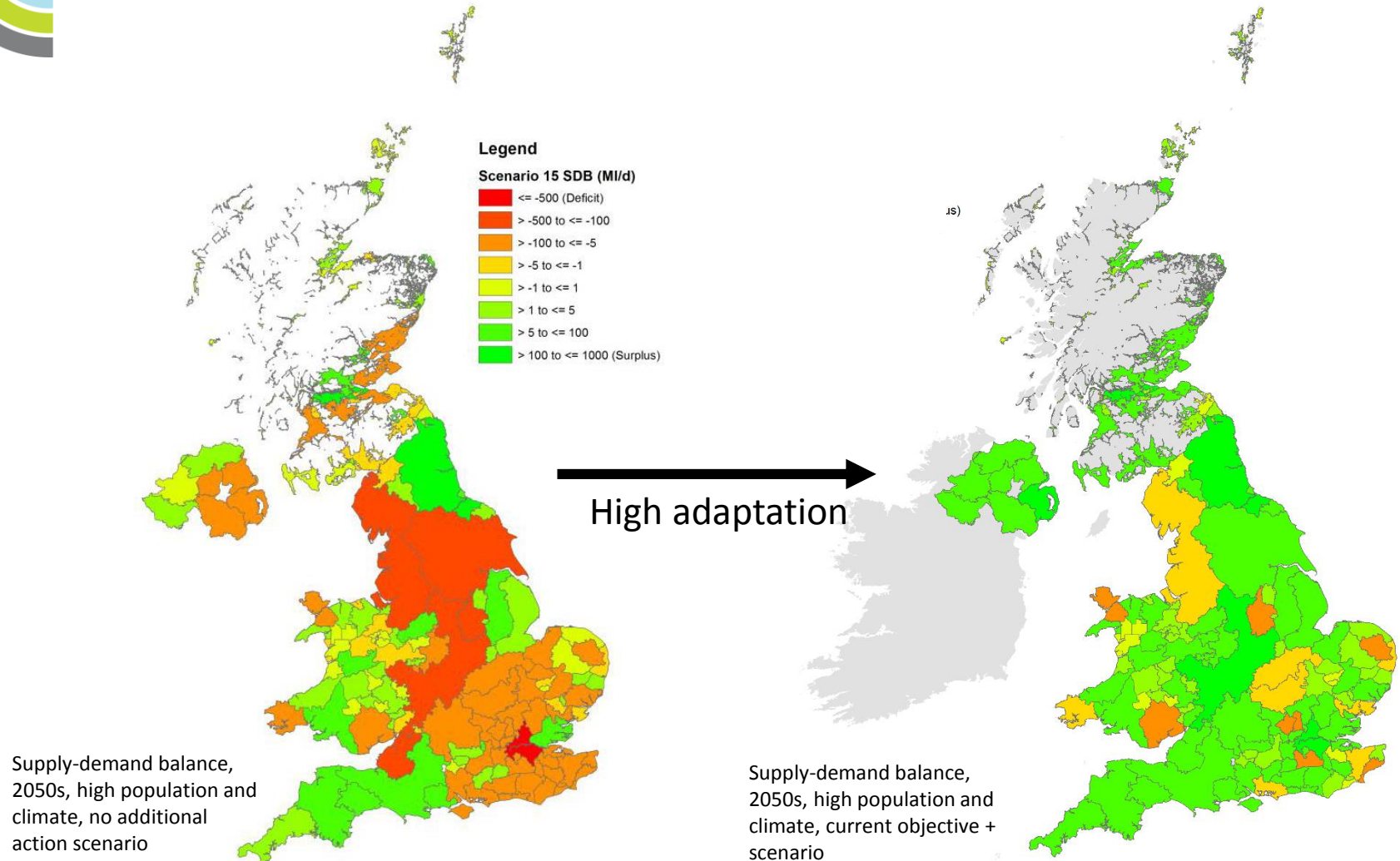
Projections of heat-related mortality with climate change (UK)



Projections of cold-related mortality with climate change (UK)



.....and water scarcity – but additional action can make a big difference



Housing report research projects

Housing report evidence included:

1. Review of previous findings in CCC reports
2. Research projects:
 - a) The costs and benefits of tighter standards for new buildings - *Currie & Brown and AECOM for the CCC (2019)*
 - b) Updating an assessment of the costs and benefits of low-regret climate change adaptation options in the residential buildings sector – *Wood Plc et al. for the CCC (2019)***

In existing homes:

- Dual flush WC, low-flow showers, washroom and kitchen tap replacements
- Flood resistance packages (e.g. 'fit and forget' measures) and basic flood resilience packages (including design and placing of appliances) during a repair
- Improved ventilation (e.g. ability to open windows), curtains, solar reflective walls, internal blinds.

In new homes:

- Water efficiency packages to get consumption down to 105 l/p/d by 2030
- Flood resistance and flood resilience (changes to building fabric, design and placing of appliances) packages
- Improved ventilation (e.g. ability to open windows), curtains, solar reflective walls, internal blinds plus external fixed shading and shutters.

Report conclusions and recommendations

Doing things right at the new build stage is much cheaper than retrofitting later

Measure	Cost (£) – new build	Cost (£) - retrofit (equivalent outcome)
Building a home with an air source heat pump and ultra-high levels of fabric efficiency (equivalent to a space heat demand of 15 kWh/m ² /yr) ¹	4,800	26,300
Passive cooling measures package ^{1,2}	2,300	9,200
Water efficiency package of measures ²	300	3,300
Flood resilience and resistance package of measures ²	1,500	3,100

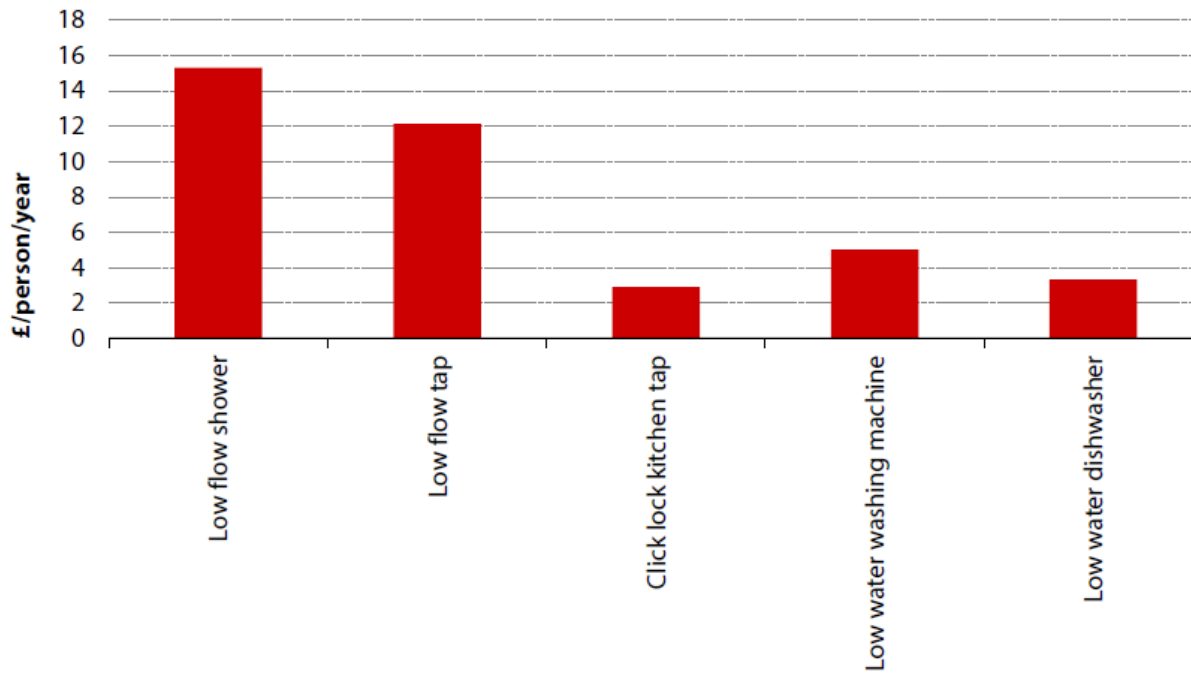
Solutions – need to be considered together in both new builds and retrofit



1. **Low carbon heat** (heat pumps) (no new homes on the gas grid by 2025)
2. **Ultra-energy efficiency, passive cooling and ventilation** together in Building Regs and retrofits
3. **Whole-life carbon** of homes (wood in construction)
4. **Water efficiency** targets
5. **Property-level flood protection** increase
6. **Sustainable Urban Drainage** as standard in new homes
7. **Urban greenspace** targets
8. **Sustainable, low carbon transport** integrated into housing design

Solutions have win-win-wins: saving money, improving health and the wider environment

Estimated bill savings from water efficiency measures



- Cost to NHS of conditions exacerbated by poor housing is £1.4 – 2.0 billion per year in England.
- Closing the performance gap could save between £70 – 260 in energy bills per household per year.

Over 30 recommendations, around five themes

Our recommendations to Government

The Government needs to take action in five areas NOW to improve the UK's housing stock and help achieve long-term emissions reduction targets. This includes:

- 1 Enforcing standards, ensuring compliance with those standards and closing the 'performance gap'
- 2 Delivering a step-change in construction skills
- 3 Retrofitting existing homes so they are low-carbon, energy efficient and resilient to a changing climate.
- 4 Ensuring new homes are low-carbon, ultra energy efficient and climate resilient, with sustainable transport options
- 5 Addressing urgent funding needs



There is an opportunity NOW to get homes right; 2050 is not far away, reviews of building standards don't come around that often, Government recognises need for policy development to deliver Clean Growth Strategy.





Recommendations for Government departments (HMT, BEIS, MHCLG, DHSC, Defra), DAs, local government, industry, regulators

What can householders do?




What householders can do today

There are number of practical, easy and cheap steps that householders can take now to adapt their homes, and reduce their bills and carbon emissions:



1 Improve home energy, heating and water usage and efficiency

-  Install low-energy lighting, hot water tank insulation, low-flow shower heads and draught-proofing
-  Turn off the lights/other electricals when not being used
-  Turn taps off when brushing teeth, have shorter showers, check pipes for leaks and water gardens only as needed
-  Install water and smart energy meters to manage water and energy use and help identify water leaks


2 Is the heating system working correctly?

-  Check your boiler annually and ensure your heating system is operating at no more than 55°C
-  Install heating controls like timers and room thermostats
-  Turn your thermostat temperature down to 19°C

3 Reduce the risk of overheating in summer

-  Opt for thick curtains or blinds (close them during the day), plant trees to provide shade and open windows at night
-  Use fans for bedrooms and living spaces (as long as temperatures are below 36°C)

4 Flooding

-  If you're in a flood risk area sign up to flood warnings and devise your own household plan to prepare for possible floods





Contact us

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What does a low-carbon, sustainable home look like?

Current technology, and measures aimed at preparing for the impacts of climate change, can help new and existing homes to become low-carbon and ultra-efficient as well as adapted to flooding, heat and water scarcity.

Existing homes

Improving existing homes can help existing house-holders meet the challenges of climate change

- 1 Insulation**
in lofts and walls (cavity and solid)
- 2 Double or triple glazing with shading**
(e.g. tinted window film, blinds, curtains and trees outside)
- 3 Low-carbon heating**
with heat pumps or connections to district heat networks
- 4 Draught proofing**
of floors, windows and doors
- 5 Highly energy-efficient appliances**
(e.g. A⁺⁺ and A⁺⁺⁺ rating)
- 6 Highly water-efficient devices**
with low-flow showers and taps, insulated tanks and hot water thermostats
- 7 Green space (e.g. gardens and trees)**
to help reduce the risks and impacts of flooding and overheating
- 8 Flood resilience and resistance**
with removable air brick covers, relocated appliances (e.g. installing washing machines upstairs), treated wooden floors



New build homes

New build homes can and should meet even more ambitious standards in some areas

- A High levels of airtightness**
- B More fresh air**
with mechanical ventilation and heat recovery, and passive cooling measures such as openable windows
- C Triple glazed windows and external shading**
especially on south and west faces
- D Low-carbon heating** and no new homes on the gas grid by 2025 at the latest
- E Water management and cooling**
more ambitious water efficiency standards, green roofs and reflective walls
- F Flood resilience and resistance**
e.g. raised electricals, concrete floors and greening your garden
- G Construction and site planning**
timber frames, sustainable transport options (such as cycling)

24%
REDUCTION
NEEDED
IN DIRECT CO₂
FROM HOMES
BY 2030, FROM
1990 LEVELS

15%
REDUCTION
REQUIRED IN ENERGY
USED FOR HEATING
EXISTING BUILDINGS
BY 2030 THROUGH
EFFICIENCY
IMPROVEMENTS¹