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Issues and the cutting edge of the energy transition

Heat and buildings strategy

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Heat and Buildings Strategy

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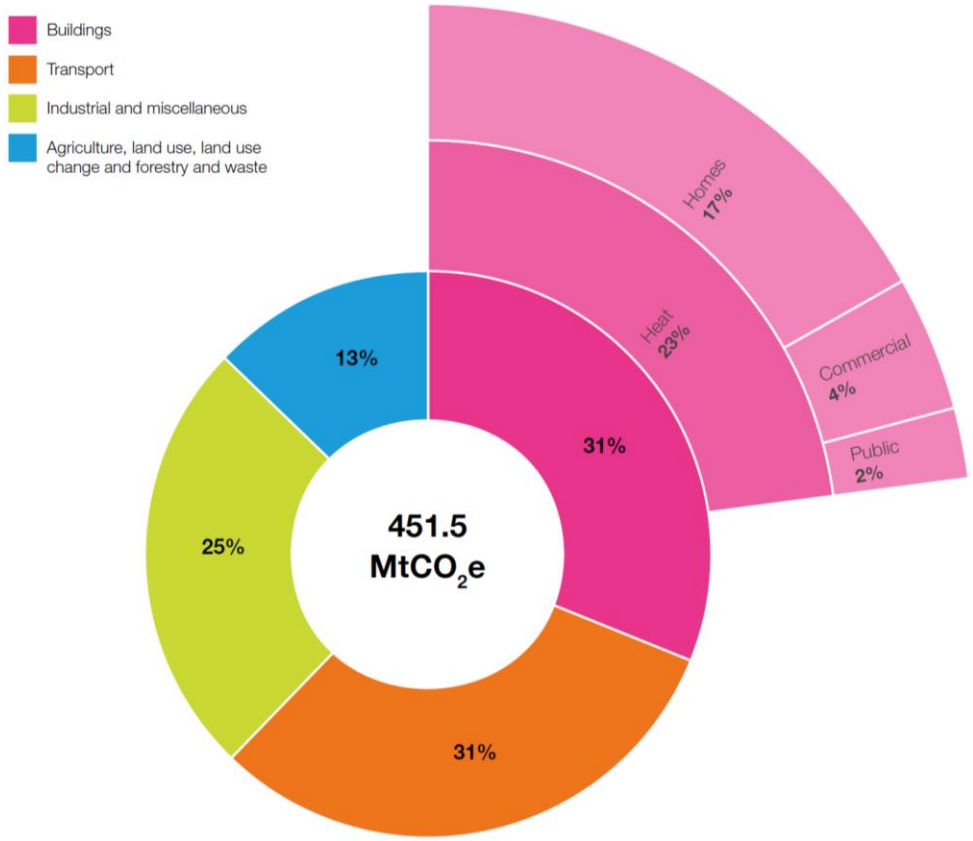
Specific areas of focus on heat & buildings

- Buildings currently make up around 31% of UK emissions. To reach Net Zero by 2050, the sector needs to be almost completely decarbonised.
- To be on track for Net Zero, we need to take a number of near-term actions, including:

1. **Make homes energy efficient** EPC C by 2035, where cost-effective, practical and affordable.
2. **Growing the UK heat pump market** 20-fold to support 600,000 annual installations by 2028 (up from ~30,000 today)
3. **Expanding use of low carbon heat networks** especially where there is waste heat and density of demand
4. **Undertaking a robust R&D programme to test the safety and feasibility of hydrogen for heating**, including through trials and pilots
5. **Enabling strategic decisions on the future of UK heating** by the middle of the decade



Challenges and resulting principles for decarbonisation

- Due to the capital costs of purchase and installation and to develop the market for low carbon heat, a mixture of **private investment and funding to support consumers** will be required to ensure that all of society can decarbonise their heating.
- **Growing energy efficiency and low carbon heat supply chains** to deliver the economies of scale in production that will help bring down their upfront costs will need to be developed to help ensure the transition is accessible to all consumers
- It will be critical to **develop the skills that are required** to carry out installations and maintenance to support the transition while ensuring that this translates to **green jobs that benefit every region** in the country.
- The approach to decarbonisation must be **fair and just** to ensure that the costs of transition do not fall disproportionately on any sections of society. These issues will change as we progress to 2050
- The mass decarbonisation of the buildings, transport and industry will bring about **a cumulative impact on the whole energy system** presenting a significant challenge to how we can decarbonise all sectors at the same time.

- We have established a number of principles to guide the development of the future framework, which include:

1. Take whole-building and whole-system approaches, and
2. Drive no-regrets action that will be needed in any future scenario
3. Target the fabric of buildings and worst cases first
4. Support the most vulnerable throughout the transition

Drive action that will be needed in any scenario

- We don't yet know what the optimal mix of heating technology will be in 2050 or how best we can get there. But we know there are actions which would be beneficial for all paths to net zero. These include:
  - **Improving the energy efficiency of the fabric of our buildings** will be crucial to addressing the three strategic objectives for heat and buildings and will need to focus on preparing building stock to for the transition to low-carbon heating, to ensure we:
    - Reduce emissions to meet our Carbon Budgets 4 & 5 – look at short at long term carbon reductions
    - Invest in skills to put us on a credible path to deliver net zero by 2050 and
    - Meet fuel poverty statutory targets by 2030.
  - **Targeting the worst performing buildings first** will ensure that fuel poor households are early beneficiaries of the transition to low carbon heating and the potential for significant bill savings more likely realised.
  - **Supporting the growth of essential supply chains** for energy efficiency and low carbon heat to deliver the economies of scale in production that will help bring down their upfront costs.

Action in the 2020s

The HBS will set out our policies and plans for the 2020s, demonstrating how they work together to ensure we are on track for net zero by the end of the decade

We will minimise disruption and maximise consumer choice by using natural trigger points, like replacement cycles, transitions in building use and tenure, and building works

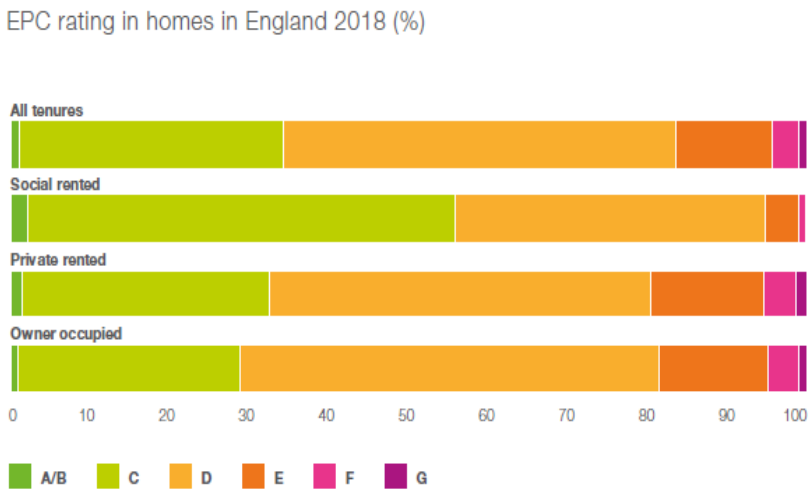
We will continue to drive progress through minimum standards, with a view to phasing out unabated fossil fuel heating and preparing buildings for installing low carbon ready systems by the mid-2030s

We will prepare the market, growing proven technology markets (such as energy efficiency, heat pumps and heat networks) so that these technologies can be deployed at scale in the 2030s and 40s

We will lead by example in the public sector, delivering carbon savings and supporting supply chain growth

Energy efficiency and retro fitting existing buildings

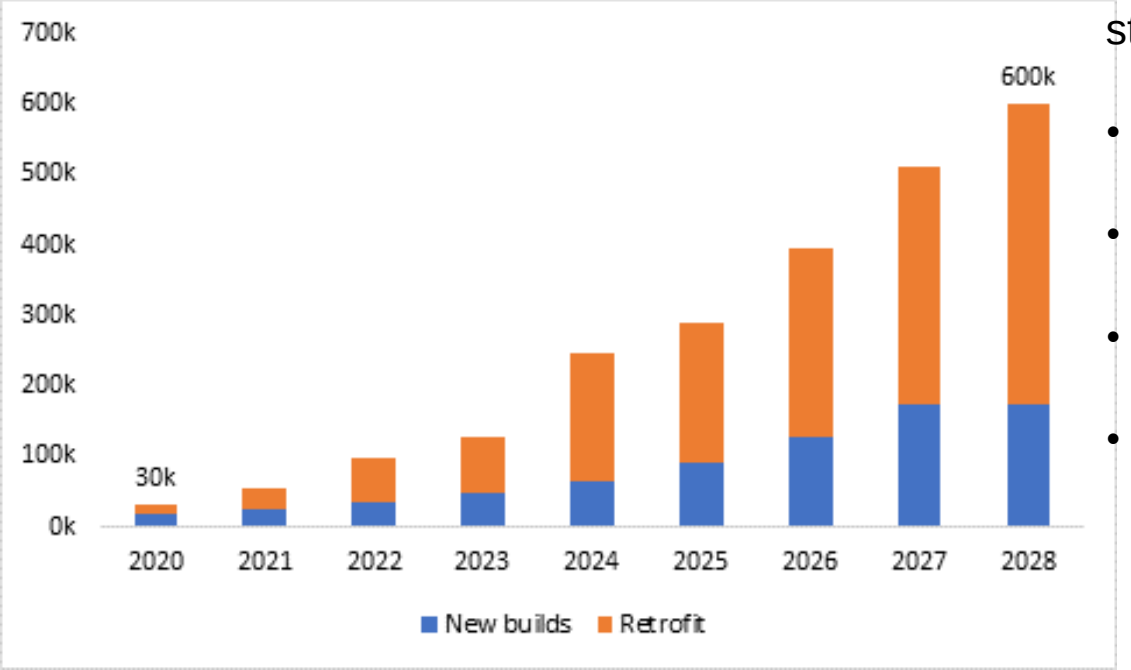
- There are approximately 17m properties currently below EPC C, of the UK's 27 million homes, most or all of which will need to be treated between now and 2050.
- To put us on a cost-effective path to 2050, as many existing properties as possible will need to be retrofitted to reach EPC C by 2035, wherever practical and affordable, and as a minimum reach a level of thermal performance so as to be of "low-carbon heat ready", to enable a smooth roll-out of mass decarbonisation.



- Wherever possible the fabric of buildings should be improved before the switch to low carbon heat.
- In some cases it may be possible for a whole house retrofit to be undertaken, where an opportunity for a deep retrofit will improve the fabric of the building, there is a switch to low carbon heating source or an upgrade of any of the in-building heat distribution system.
- In all cases we will work with the grain of the market to reduce cost, minimise disruption and help ensure consumers get a good deal.

Scaling up to 600k heat pumps by 2028

We have identified a **minimum market capacity for net zero** of **600,000 heat pumps per year by 2028,** in readiness for further market growth beyond that if needed



We are **putting a comprehensive policy framework in place to support this transformation** of the heat pump market, featuring a balance of regulatory, public investment and market-based policy measures as well as action on a range of key enablers.

Within this, we are targeting no-regrets areas first and investing strategically, including:

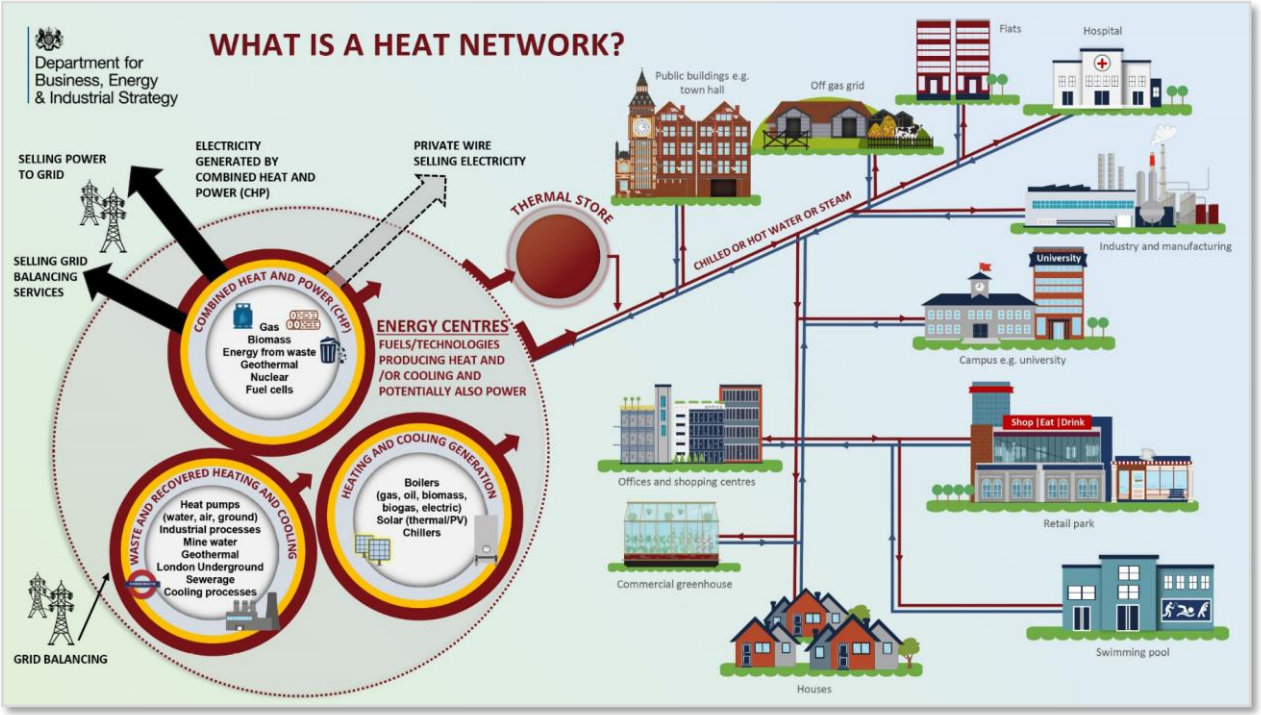
- Ensuring new buildings are low-carbon through the **Future Homes Standard** and **Future Buildings Standard**
- Consulting on phasing out the installation of new fossil fuel boilers **off the gas grid**
- Introducing measures to improve the incentives for industry to invest in the **heat pump supply chain**
- Supporting low-income households and other consumers to take up a heat pump through local delivery and social housing delivery funding schemes

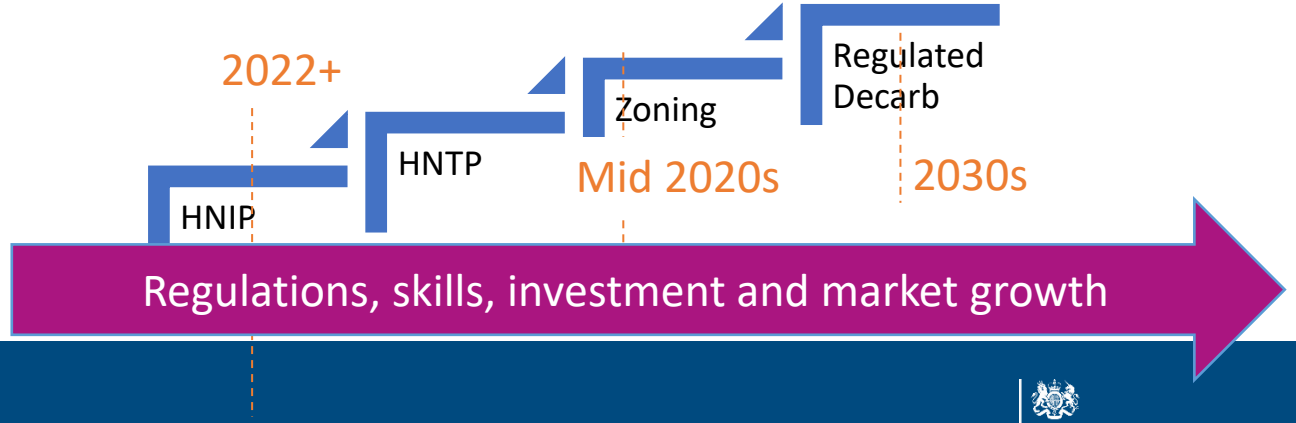
Expanding the use of heat networks

Current situation: supply around 2% of the UK's heat supply.
Future situation: Committee on Climate Change projects an 18% share and an investment of £17.5 billion in heat networks by 2030 for cost effective deployment.

The **Heat Network Transformation Programme** is a step change in the heat networks ambition bringing together a number of inter-related projects that will jointly deliver:

- increased volumes of low carbon heat
- the creation of new, regulated and more efficient heat networks and heat sources
- investment and jobs growth in the heat network manufacturing and technology
- creation of a more capable professional heat network sector with increased delivery capacity





Trialling the feasibility of hydrogen heating

- We know that **hydrogen has an important role to play in net zero** - it will have uses including in industry and heavy transport. We are carefully considering the mix of different low carbon heating technologies across the different pathways.
- First **hydrogen-ready boiler prototypes** unveiled last year as part of **Hy4Heat** research programme. Testing is ongoing at the 'HyStreet' testing site at RAF Spadeadam.
- We are funding two **demonstration buildings in Gateshead** to showcase use of hydrogen fuelled appliances in a realistic domestic setting. (Project: **Hy4House**). Opening summer 2021.
- The Ten Point Plan set out an ambitious vision to test potential: Hydrogen **Neighbourhood by 2023**, Hydrogen **Village by 2025**,.
- We will continue to **work with industry** to evaluate the potential for hydrogen to heat our buildings, informing **strategic decisions around the mid-2020s** over its long-term role.

System Transformation

Consumer trials[1]

Testing[2]

Image sources: (1) Gateshead, Baxi, (2) Spadeadam, HVP Mag.

Longer term strategic decisions

The ban on petrol and diesel cars has been successful in transport – we know we will need to completely move away from natural gas boilers no later than mid 30s, in order to utilise natural replacement trigger points.

- Determining the future mix of low carbon heat in the UK **requires setting direction on the relative roles of hydrogen and heat pumps** in decarbonising heating on the gas grid. Desk-based studies cannot answer this question
- We will use the **next five years to invest in the technologies and develop the markets** on the basis that either electrification or hydrogen will be the dominant solution
- No-regrets is not low change over the next five years – we need to **grow the HP market** by 20x (in 7 years) and undertake **large-scale trials for hydrogen**
- We are working on the best way to take decisions in the middle of the decade