Submission: Comprehensive Spending Review (Sept. 2020)

Organisation: The Energy Saving Trust
Contact: Naomi Baker naomi.baker@est.org.uk

Summary of EST recommendations

The Energy Saving Trust welcomes the opportunity to respond to this consultation. We have proposed investments on upgrading the fabric and decarbonising heat in homes

The first main proposal is for a £7.8bn (2021-24) investment into an ambitious programme to upgrade (by 2030) the 16 million homes in England with inadequate energy inefficiency. This is a capital programme worth £80bn, three quarters of which would be funded by private finance. A further £10.1bn of public investment (from 2024-2030) would be required to deliver the full programme. The second main proposal is for a £1bn clean heat grant fund to build the heat pump supply chain.

All our proposals would contribute strongly to the government's strategic objectives of:

- Economic recovery
- Levelling up
- Public services (reducing NHS costs relating to the health impacts of cold, damp homes)
- Scientific super power

Investment here offers greater scope for related exports, thereby also contributing to the further objective on strengthening the UK's place in the world.

1. Energy efficiency in homes

The government's existing target (from the Clean Growth Strategy, 2017) for improving the energy efficiency of homes by 2035 is based on the UK's previous target of an 80 percent reduction in emissions by 2050. It is not sufficient for the current legal target of net zero by 2050 and risks both slowing and increasing the cost of the transition to low carbon heat. Imperial University, for example estimates that decarbonising heat without first reducing demand sufficiently could add £6bn per year to the system operating costs that are ultimately borne by customers.

This week the Energy Saving Trust have launched a new campaign calling for this target to be bought forward to 2030 and a new programme to improve up to 16 million EPC D-G homes in England by 2030. This would build on the £2bn funding from the Green Homes Grant (GHG), requiring a further **£7.8bn** in this parliamentary term[1] and a further £10.1bn from 2024-30. There is a further break down of these costs in the EEIG's new report available from end September here.

If accompanied by a programme of appropriate regulation, finance and support for households, this additional £17.9bn of public investment would stimulate over three times this level of private finance, generating a total capital spend of around £80bn+. The programme to retrofit up to 16 million homes, at an average of £5,000 per home, by 2030 would generate and sustain 150,000 jobs.

[1] This would bring the total additional invested in this parliamentary term to £9.8bn - £0.6bn higher than the £9.2bn set out in Conservative manifesto. This is due to the lower leverage of stimulus-focussed GHG

Each household would benefit from an average of £400 per year in avoided energy costs – a total of £6.4bn going back into people's pockets to be spent in local economies across the country.

We do not think that this scale of change is viable without new regulation to ensure that when homes are sold, let or undergo major refurbishment, they meet the required level of energy efficiency (or achieve this within a reasonable period post-sale). We would strongly welcome the use of mortgages as a lever for change but highlight that the proposal will not affect homes owned without a mortgage (which account for around a third of the stock).

The use of a mortgage lever combined with appropriate regulation and a package of incentives and support for homeowners, would drive the market and ensure that that people's investment (in time, money and 'hassle') to improve their homes is rewarded in enhanced capital values.

The public finance would be needed to fund measures for low-income households, to subsidise more expensive measures as well as to fund consumer incentives (tax breaks such as LESA for landlords, stamp duty breaks etc.) and enabling support such as low-interest loans, household advice and engagement. Our campaign document explains more about the approach we recommend here.

Funding proposal: £7.8bn

2. Heat pumps

The UK's net zero by 2050 target means that we need to almost completely decarbonise heating in the domestic sector. Given the average 15 year lifetime of gas boilers (used in 85 percent of homes), this suggests that replacement fossil fuel heating should cease by 2035 at the latest. Continuing beyond this point risks having to make reductions in other, potentially more costly sectors (or replacing heating systems before the end of their useful life).

The role of heat pumps versus hydrogen

We fully support on-going research into hydrogen's role in heating but are concerned that a focus here is detracting from necessary progress with energy efficiency and electrification.

Decarbonisation heating is likely to require a range of solutions – heat pumps, low carbon gas and heat networks in different combinations in different parts of the country. It is important that progress is made on all fronts.

The Committee on Climate Change (CCC)'s assessment of hydrogen's potential role in home heating (Hydrogen in a low carbon economy[2]) was that it was likely to have more of a back-up/ niche role: *'Our assessment is now that heat pumps, powered by increasingly low-carbon electricity, offer the potential to provide heat efficiently for most of the time, with hydrogen boilers contributing mainly as back-up to meet peak demands on the coldest winter days'.*

Hydrogen could make a valuable contribution by:

i) reducing the amount of overall and peak generation plant required

ii) avoiding expensive work to reinforce electricity grids especially in urban areas where the cost can be up to three times as high (CCC, 2019)

iii) providing inter-seasonal storage (through the pipework and existing storage facilities)

[2] https://www.theccc.org.uk/publication/hydrogen-in-a-low-carbon-economy/

Barriers to a more widespread use of hydrogen in heating

Barriers to hydrogen playing a more dominant role in home heating include availability, cost and residual emissions.

Availability: This modelling[3] of a gas-led heat transition modelling carried out by Imperial University for the Energy Networks Association (ENA - the body that represents the gas transmission and distribution network operators), suggests that it will not be feasible to use low carbon gas as a direct replacement for natural gas due to the higher cost of the gas, its lower availability and residual emissions. It proposes hybrid electric/ gas systems as the dominant technology for homes connected to the gas grid, with hydrogen boilers deployed in clusters close to areas with hydrogen production, and pure electric heat pumps in off-grid homes.

Carbon budget: The modelling commissioned by the ENA suggested that half of the low carbon gas available in 2050 would be 'blue hydrogen' (produced from gas with the carbon dioxide emissions captured and stored with Carbon Capture and Storage technology), and a further quarter biomethane. Whilst 'blue' hydrogen is a low carbon gas, it is not zero carbon – providing '*lifecycle emissions savings of 60-85% relative to natural gas use in boilers'* (CCC, 2019). This makes widespread deployment more challenging under a net zero target. The CCC say here: *'If hydrogen from gas with CCS is deployed in very large quantities, the emissions savings may be insufficient to meet stretching long-term emissions targets'*. (CCC, 2019).

Since the CCC published their report, new evidence (in the journal, Nature) suggests that the methane impacts of fossil fuel extraction could be up to 40 percent than previously thought (methane is roughly 30 times more potent as a heat-trapping gas than carbon dioxide). This would reduce the savings from 'blue' hydrogen still further.

'Green' hydrogen (hydrogen made from splitting water using renewable electricity) would avoid this issue. However, it is currently prohibitively expensive and whilst cost reductions look likely, the cost of renewable electricity will remain a constraint. The CCC suggest that this would need to fall to around 10MWh for 'green' hydrogen to compete on a cost basis with 'blue' hydrogen.

This is feasible but would take time to get this cost reduction and for electricity generation to scale up sufficiently. This may not be compatible with a net zero by 2050 target. Also, whilst a significant drop in the price of renewable electricity would make 'green' hydrogen more affordable, it would have the same impact, but to a greater degree, on efficient electric heating (heat pumps produce around 3 units of usable heat from each unit of electricity whereas heat from 'green' hydrogen fuelled boiler would produce less than one unit).

This does not mean that low carbon gas cannot play a useful role – but highlights that, from a cost perspective, it should be used selectively.

Cost: Current estimates seems to suggest that the cost of hydrogen from gas (SMR with CCS) would be two to three times the current unit price of gas. This from the CCC, for example, suggests 2.5 times higher. As an organisation that works to reduce both fuel poverty and carbon emissions, the Energy Saving Trust would welcome greater transparency about these potential costs. We are particularly interested in how proposals will affect running costs for households and how these costs would be socialised throughout society. Until there is greater clarity on these costs, the likely impact on consumers and how these costs will be distributed, we would advocate for a prudent approach to investment especially where this would be borne by consumers.

The role of heat pumps and the need to scale up: Whilst there could be an important contribution from low carbon gas, we would expect (for reasons of consumer cost, availability and carbon

[3] https://www.energynetworks.org/gas/futures/pathways-to-net-zero-report.html

reduction) for heat pumps to make up a large part of the solution (whether this is in a pure electric or hybrid electric/ gas form).

If the sector is to be able to meet this potential demand by 2035, there is an urgent need for it to scale up. In 2019, less than 30,000 heat pumps were installed, compared with 1.7 million gas boilers. The strategic need (the risk of missing the legal net zero target and/ or increasing consumer costs) supports the use of public finance to support the sector to grow. Whilst heat pumps are a relatively mature technology with less scope for cost reduction (the CCC estimate a 30 percent reduction is feasible by 2030), a heat pump sector deal approach that focusses on facilitating innovative retail offers ('heat as a service' for example) and valuing the grid services that heat pumps can provide (for example, demand shifting) has the potential to move the technology from a niche product to a mass market technology that is competitive with other heating solutions.

Our recent blog here (and Clean Heat Grant consultation response) sets out our recommendations' for building the supply chain, focussing support initially on the 'no-regrets' area of off-grid homes (3 million homes, 85 percent of which are likely to be suitable for a heat pump). An early focus should be the 1.5 million homes currently using expensive and high-carbon fossil fuels such as oil, coal and LPG.

We propose that the Clean Heat Grant run for a 4-year period with a fund of £1bn (rather than for 2 years with a £100 million fund). A start date of April 2021 (rather than 2022) would build on the interest generated by the Green Homes Grant. If supported by regulatory changes (to promote and better value demand shifting), tax changes (to rebalance/ reduce the levy payments on electricity and gas) and support in skills and training this could transform the market.

Funding proposal: £1bn Clean Heat Grant scheme

3. Advice

Improving the energy efficiency of 16 million homes and moving away from fossil fuels in home heating will require public finance, innovative finance for those self-funding and regulation. It will also require the participation of almost all households. There is currently a low awareness that heating contributes to climate change and far less awareness of the changes that will be required to get to net zero.

In order to 'bring people along' with this change, there needs to be an investment in both public communication (for example a government-backed campaign along the lines of the digital switchover) and in a consumer-focussed service to listen to householder concerns, provide expert and impartial advice, ensure that people know what to do and how, and promote confidence that adequate reparations will be made if anything does go wrong.

If people aren't comfortable in acting, because they don't know how or because they fear risks to their property, then they won't act, even with financial incentives and regulation.

Whilst technical advice has been built into the PAS quality framework (which requires a Retrofit Advisor and Coordinator for whole house retrofits), and there is shift towards Green Passports (both of which we warmly welcome), there remains a gap in the Each Home Counts Review (and the proposed customer journey) that is not covered off by a static website such as Simple Energy Advice.

The Review makes it clear that: *'Impartial advice and engagement play a central role in overcoming the barriers to a well-functioning market for energy efficiency and renewable energy measures: it drives the uptake of measures at a faster rate than will be achieved by the market alone'.*

This role is vital in both encouraging compliance with a minimum standard (especially for low-income groups) and for encouraging self-funding households (especially early adopters) who, with additional reassurance may go further, faster.

The Energy Saving Trust's work for the Scottish Government (see here) highlights that with sufficient customer hand-holding, a proportion of households will retrofit to a very high standard where they access sufficient support (advice on what measures are appropriate, how to manage the process) and finance. Whilst regulation (minimum energy standards at sale and rent) and incentives (green mortgages, stamp duty reductions etc.) will be required to drive the scale of change, a programme structured to maximise this group of households can reduce government costs elsewhere (on heat transition, on demonstration programmes).

Funding proposal: We would be happy to provide further information here.

4. Tax

VAT: Reducing VAT for all relevant energy and carbon improvement to homes alongside a widespread retrofit programme (as advocated above) would increase the overall VAT revenue whilst reducing the cost for consumers.

Distribution of energy environmental/ social levies: A major barrier to developing a mass market for electric heat pumps is the large price differential between gas (as the main heating fuel) and electricity.

This is exacerbated by the lack of any carbon price on gas (whereas electricity generation is taxed upstream via the EU Carbon Trading Scheme and Carbon Floor Price with the costs passed down) and the imbalance in how environmental and social levies are distributed between gas and electricity.

Levies accounted for just 1.6% of the gas unit cost in 2019 compared with over 20.4% for electricity (see our blog on this here). When combined, these factors results in an implicit subsidy for gas use. Whilst any change must be done in a way that does not reduce the ability of low-income groups to heat their homes, we would like to see this reviewed.