



Achieving Fairness in Carbon Emissions Reduction: The Distributional Effects of Green Fiscal Reform

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About the Green Fiscal Commission

The Green Fiscal Commission is an independent body and is not affiliated to any political party or government. Its membership includes experts from business, leading academics, senior MPs from all three main UK political parties, three members of the House of Lords, and representatives from consumer and environmental organisations.

The Commission's aim is to assess the social, environmental and economic implications of a substantial green tax shift, such that 15-20 per cent of tax revenues come from environmental taxes. The Commission has reviewed and collated the existing evidence on the implications of a green tax shift as well as conducting new research. The results from this work have been placed in the public domain to stimulate debate and, we hope, action on this agenda.

This briefing is one in a series of briefings intended to cover the main issues associated with green fiscal reform. Other briefings have already been published on topics ranging from 'Public Opinion on a Green Tax Shift' to 'How effective are green taxes?'. These are available on the Green Fiscal Commission website: www.greenfiscalcommission.org.uk

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Summary

An important consideration in the introduction of environmental taxes and green fiscal reform is fairness. This Briefing looks at the distributional issues involved in green fiscal reform, in particular how this measure would affect households on relatively low incomes.

The UK is committed to reduce its emissions by 80 per cent by 2050. Household energy use and transport will need to play their parts in that reduction. Householders will need assistance to improve the insulation of their properties, but there will also need to be obligations and financial measures to ensure that the improvements are made.

Since increasing incomes and improvements in energy efficiency lead to greater demand for energy services, there is a case for a carbon tax to be introduced to make the use of carbon-based energy more expensive. Because household energy use is regressive (it rises much more slowly than income), taxing household energy is politically controversial. In fact, the revenues can be recycled to households such that most low-income households would gain. The problem really lies in the effect on those low-income households in energy-inefficient homes. A scheme to identify them and improve the thermal efficiency of their homes would be required to make the carbon tax politically acceptable.

Similar distributional issues arise for the taxation of motoring but they are less severe. Increasing fuel duty is progressive overall because most low-income households do not have a car, but there is concern about the impact on low-income motorists, particularly in rural areas. The issue can be addressed through appropriate recycling of the revenues and by the adoption by rural motorists of fuel-efficient cars and driving methods.

There are few genuine distributional concerns about increasing taxation on air travel because most leisure flying is by the wealthiest 20 per cent of the population and those on low incomes fly very little.

Fairness demands that rich societies like the UK do their utmost to mitigate climate change. This will require energy prices to rise. The approach described here could enable this to be achieved without unfair impacts on vulnerable households.



Introduction

Climate change is not fair. It is hitting and will hit hardest those alive today in the poorest countries, and those in future generations, who have done least or nothing to contribute to it. Fairness therefore requires that societies, especially relatively rich societies like the UK, do their utmost to reduce the extent of climate change. To signal its determination on this issue, the UK Government has put in place a statutory commitment to reduce the UK's emissions of greenhouse gases by a minimum of 34 per cent by 2020 and 80 per cent by 2050 from a 1990 baseline.

Both home energy use and transport will need to make a significant contribution to emissions reduction if the targets are to be met. The work carried out by the Green Fiscal Commission suggests that green fiscal reform has a major role to play in reducing carbon emissions from energy use. This Briefing describes the distributional effects of a green fiscal reform; in particular the effects on vulnerable households, and the complementary measures that will need to be introduced if vulnerable households are to be treated fairly by such a policy.

Household energy

Reducing carbon emissions from household energy

Commentators are generally agreed that meeting the 2050 target will require at least the same order of percentage reduction of carbon emissions from the UK housing stock (e.g 80 per cent) as from other sectors in the UK. The only way that this can be achieved while maintaining the warmth of housing in winter is through a massive refurbishment of existing housing to achieve a great change in its energy/thermal performance. The scale of the necessary programme is huge. Raising the energy efficiency of existing housing to the necessary level could cost an average of around £10,000 per home, or about £250 billion for the entire UK housing stock, if it were carried out through a bespoke programme. It would cost much less if the necessary work was carried out when homes were being refurbished or redecorated anyway.

Energy efficiency and conservation work seems simple, but the level of energy-saving envisaged is actually technically difficult to achieve. Any programme would have to be carried out by skilled workers and carefully monitored. Current levels of expertise in this area in the UK building industry

are nowhere near adequate, and monitoring of energy upgrades is very rarely carried out.

There is strong reason to believe that nothing like enough people will upgrade the energy performance of their buildings to permit a purely voluntary programme to build to the necessary scale. Both stronger incentives and obligations will be required for this. A legal obligation could require both householders and contractors to do the necessary improvements when other work is being done.

Fuel poverty

The government also has a target to abolish fuel poverty 'as far as reasonably practical' by 2016 and among 'vulnerable groups' (households with children, over 60s and disabled people) by 2010. Fuel poverty is defined in terms of what a household would have to spend to achieve a standard heating regime defined as 21°C in the living room and 18°C in other rooms 8 hours a day on weekdays if everyone in the household goes to work or school and 16 hours



a day otherwise. If the cost of that and other expected energy services is greater than 10 per cent of income then the household is considered to be in fuel poverty (Boardman, 1991). The rationale for the choice of 10 per cent as the threshold was that at the time Boardman defined it the average household spent 5 per cent of its income on energy and 10 per cent was twice as much. It had no scientific basis (Healy, 2004). Energy bills accounted for a declining proportion of average household income until 2003, but they have now returned to about 5 per cent of income, as they were when Boardman originally defined fuel poverty.

Fuel poverty fell dramatically in the years between 1996 and 2003. The reduction in the numbers of households in fuel poverty was attributed by DWP (2007) as:

- 61 per cent to extra income,
- 22 per cent to lower fuel prices,
- 17 per cent to energy efficiency measures.

Due largely to rising energy prices, the number of fuel-poor households in England increased from 1.2 million in 2003 to 3.5 million in 2008, more than the 3.4 million households in 1998. Energy prices have been falling in recent months, but declining supplies of North Sea gas and increasing reliance on imports from Russia and the Middle East are likely to lead to rising gas prices in the medium term, particularly with the recent formation of the Gas Exporting Countries' Forum, a cartel of gas-producing states including Russia and several members of OPEC.

A recent study (Moore et al., 2008) found that a considerable number of low and zero-carbon (LZC) technologies and insulation measures would be required to alleviate fuel poverty. However, there will still be a hardcore group of fuel-poor – about 30 per cent of them – that cannot be

lifted out of fuel poverty by current technical measures alone. That is due to a combination of low incomes, high fuel prices, under-occupancy and inherently inefficient housing. The proportion remaining would require either improved income or a change in circumstances – such as the householder moving to a smaller, more affordable property. Their modelling assumed *perfect targeting* of fuel-poor households with all possible measures to take households out of fuel poverty or alleviate it as far as possible. They found that £9.2 billion would take 71 per cent of the 2.5 million fuel-poor households in England in 2006 out of fuel poverty and alleviate it in the other 29 per cent.

In reality, much more would have to be spent to achieve those results because of imperfect targeting. Because households move, their incomes rise and fall and fuel prices fluctuate, attempting to target the households in fuel poverty is not going to be completely effective and that reinforces the case for attempting to improve the energy efficiency standards of the housing stock generally.

Moore et al. (2008) project that with expected rising energy prices and despite current anti-fuel poverty programmes, fuel poverty – far from being abolished – will actually increase over the period to 2016.

Boardman (2007) states that the 20 per cent of households with the lowest incomes spend about £500 a year on fuel. If they were to be adequately warm in their unimproved homes, it would be at least twice this amount. Tackling fuel poverty by increasing incomes would be very expensive

The DTI calculated in 2004 that a SAP rating¹ of 65 was needed for a household with minimum income to be able to avoid fuel poverty. Boardman (2007) states that with higher fuel

¹ The Standard Assessment Procedure (SAP) is the Government's recommended system for energy rating of dwellings.



prices than in 2004 even SAP 65 will be too low. The equivalent in 2007 would have been SAP 80. She sets an objective to increase the average of the entire housing stock to 80 and the minimum to 50 by 2050 in order to meet the objective of an 80 per cent reduction in emissions from housing by that date. It seems that dealing with fuel poverty at the level of the housing stock will require raising the efficiency of the sort of dwellings that low-income people live in to at least SAP 80, assuming that energy prices are at roughly 2007 levels. The cost of that (as already noted) could be about £250 billion for the entire UK housing stock, or less if the necessary work was carried out when other work was being done in the home.

Ideas for radically improving housing energy efficiency

A number of ideas have recently been put forward for encouraging or facilitating people to improve the energy efficiency of their homes.

1. Pay As You Save

A financial mechanism will need to be provided to enable people to undertake the necessary work on their buildings. The most promising model so far proposed is a Pay-As-You-Save scheme (UKGBC, 2009) that involves no upfront cost to the householder – the cost of the works would be paid back through their energy bills. The cost would stay with the home's energy bills, so the householder would not have to continue to pay if they moved. That is important because some insulation and other energy measures take ten or twenty years to pay for themselves in savings and householders are often unwilling to pay for them because they fear they will not stay there long enough to benefit financially.

2. A council tax incentive

British Gas has been operating a scheme with local authorities for the last few years where householders are

given a one-off council tax reduction of £125 if they have cavity wall insulation installed. British Gas funds the scheme as part of its Carbon Emissions Reduction Target (CERT) activities. The scheme started in Braintree, Essex, but 64 local authorities now participate. It has been found to be quite effective at motivating people to get insulation because they dislike council tax so much. A similar scheme could be implemented nationally, but covering other types of insulation as well. The idea received overwhelmingly positive responses at the Green Fiscal Commission's deliberative events. (Further details of these events are contained in Green Fiscal Commission Briefing Paper 3: Public Opinion on a Green Tax Shift).

3. Area-based schemes:

There are a number of programmes to improve the energy efficiency of dwellings on a street by street basis, some of which include the installation of low-carbon technologies such as solar water heating. The Warm Zones programme was set up in 2001 in order to target energy-efficiency programmes on the fuel-poor. An evaluation in 2005 (EST, 2005) found that the programme had taken around 8,000 households out of fuel poverty (about 7 per cent of fuel-poor households in the five areas covered) at a cost, exclusive of the energy efficiency measures, of about £1,000 per household, i.e. the cost was for the administration and targeting of the households. This gives some idea of the difficulty of reducing fuel poverty.

In September 2009, following consultation, the government launched the Community Energy Saving Programme, which has a budget of £350 million and "promotes a 'whole house' approach i.e. a package of energy efficiency measures best suited to the individual property. The programme is delivered through the development of community-based partnerships between Local Authorities (LAs),



community groups and energy companies, via a house-by-house, street-by-street approach. ... Around 100 schemes are expected, benefiting around 90,000 homes and saving nearly 2.9m tonnes of CO₂ emissions. CESP is expected to deliver annual average fuel bill savings for those households involved of up to £300."²

4. Regulation of private landlords

Tax incentives can motivate owner-occupiers to undertake improvements and the Decent Homes standard introduced by government has been effective at forcing local authorities and housing associations to make improvements. However, existing tax incentives for private landlords have been ineffective. The energy performance of the private rented sector has been improving only very slowly. It is difficult to motivate private landlords to make these improvements unless they are subsidised by at least 100 per cent of the cost. Energy Performance Certificates (EPCs) make tenants aware of the running costs of a home and may lead to landlords taking more action, but the most effective approach would be regulation. It would be relatively simple to require landlords to undertake all the basic insulation measures recommended in their EPC before they could rent out a property. Of course, landlords would also be covered by a general obligation on house-owners to improve the energy efficiency of their buildings to required levels when they were carrying out other building or decorating work described in more detail below.

5. Regulation of all householders

At present houses need to be rated and receive an Energy Performance Certificate when they are built, sold or rented out. Owners could be required to meet a particular standard before the home could be resold or re-let. The standard required could increase over

time. Alternatively, this certification process could be extended to all homes, with the requirement that householders carry out cost-effective energy efficiency improvements within a prescribed period of time.

6. A revenue-neutral carbon tax

Energy use is fundamental to all kinds of economic activity and therefore will tend to increase with increasing economic activity and income. Improving energy efficiency alone will not be sufficient for meeting carbon targets as, although it will reduce the consumption of energy for the delivery of any given service, it will also increase the demand for energy services overall. An example is the way that double glazing of conservatories has led to the heating of conservatories that would have previously been unheated. This, combined with the continual creation of new energy service demands through innovation, will overwhelm particular reductions in consumption from the efficiency improvement.

The only change in economic circumstances that has been shown systematically to reduce energy consumption is an increase in energy prices. Increasing the price of energy appears to be the only policy that contributes to all three possible options for meeting the carbon reduction targets: stimulating low carbon investment, increasing energy efficiency and decreasing demand for energy services. The great ancillary advantage of governments raising energy prices through green fiscal reform (rather than this occurring through world market price movements) is that they can reduce other taxes in compensation and, by stimulating greater energy efficiency in this way, make the economy less vulnerable should world market fuel prices rise in the future.

² Quote from http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/saving_energy/cesp/cesp.aspx



Although richer households tend to use more energy than poorer ones, the difference is nothing like as great as the difference in incomes. By itself, therefore, a carbon tax on household energy would be regressive, in that the tax payments would tend to be a higher proportion of the income of poorer than of richer households.

However, if there was a carbon tax imposed on domestic energy and the revenues were recycled to each household as an equal lump sum, for example a flat-rate discount on council tax, then it would be progressive because about 75 per cent of the poorest 20 per cent of households would gain and only about 25 per cent would lose. That is because despite the regressive nature of household energy use, most of the poorest households use less than average energy.

Alternatively, the carbon tax could be returned to households as an 'ecobonus' in the form of a flat-rate income tax reduction, tax credit or benefits increase based on the number of adults and children in the household. It would be distributionally the same as that of a personal carbon allowance scheme where each person was given a tradable quota for their carbon emissions that could be bought and sold (Fleming, 1997; Hillman, 2004), but administratively far simpler.

About 74 per cent of households in the bottom two deciles would gain and 26 per cent lose out if there was a carbon tax on domestic energy and motoring recycled through this ecobonus (Dresner and Ekins, 2004b). Only a few per cent of low income households would lose more than £1 per week if the tax was set at £10 per tonne of carbon dioxide. That is actually slightly better than the effect of carbon taxes on domestic energy (Dresner and Ekins, 2004a) and motoring (Dresner and Ekins, 2004b) if the revenues are recycled entirely through benefits and tax credits with

normal levels of uptake. The results would be slightly more progressive still if aviation was also included (Dresner and Ekins, 2004b). Recycling through the benefits system is only better for low-income households if higher rates of benefits uptake are assumed. An ecobonus would also be politically more popular as it offers something to all households, rather than only returning money to households on benefits.

There could also be a programme to identify those low-income households that would still lose out and insulate them before the introduction of a carbon tax. Other measures to help vulnerable households could include a five-year grace period during which those on benefits could have their carbon tax refunded, to allow the energy efficiency programme to get fully established, or restructuring of Winter Fuel Payments to contribute to the energy efficiency loan repayments of vulnerable households.

The need for a new policy approach

Current government policies on home energy are both dominated and constrained by concerns about fuel poverty. As already discussed, the level of fuel poverty as presently defined derives from a complex combination of and interaction between a number of factors: incomes, energy prices, home energy efficiency, building occupancy and the norms of the 'standard heating regime'. The main result of political commitments to reduce or 'abolish' fuel poverty have in practice been government attempts to keep home energy cheap. This has undermined parallel government efforts to persuade householders to improve the energy efficiency of their homes, and reduced the impact of the energy efficiency measures that have been implemented because of the inexorable rise in the demand for energy services as general incomes rise and energy use becomes more efficient. It is very unlikely that the



required improvements in home energy efficiency, and reductions in overall home energy use, will be delivered if this approach is maintained. Such systematic improvements will require a systematic, substantial and sustained increase in the price of home energy.

This is not the place to lay out a new policy approach for energy efficiency in any detail, but if the government is to be able to raise home energy prices (through green fiscal reform, so that other taxes are simultaneously reduced) in order to help meet its carbon dioxide reduction targets, a new policy approach to energy-use by low-income households is required. A political commitment that vulnerable people should not have to be cold in an affluent society like the UK does not require a political commitment to 'abolish' fuel poverty, which is probably unachievable on its current

definition, as discussed above. Rather government could guarantee to facilitate the necessary improvement in the energy efficiency of the homes of *all* vulnerable householders, through a scheme with the elements set out in Box 1 (overleaf), some of which have already been touched on. Where the problem of excessive heating costs is more related to the size of the property and its under-occupation than to its thermal inefficiency, government could provide support for vulnerable householders to enable them to move to more suitable accommodation.

While the programme in Box 1 clearly needs much refinement on the basis of detailed analysis, it is unlikely that carbon emissions from buildings can be reduced by the required extent by 2050 without all these elements being present in some degree.

BOX 1

Elements of a possible Household Energy Efficiency Programme to achieve radical reductions in emissions without adverse effects on vulnerable households

1. Mandatory energy efficiency certification for builders (comparable to the CORGI and now Gas Safety Register scheme), with training provided by the government. Now, when the industry is in a downturn, would be a very good time to initiate this. This would reduce the need for a separate Energy Efficiency Advice Service, as builders would provide this (as they do for all sorts of other building work).
2. A 'Contractor Obligation', to apply to builders and decorators, to ensure that mandated energy efficiency work is carried out on all buildings whenever they were called in to do other work. They would only be required to carry out work in those areas of the house where they were working anyway. The extent and nature of this Obligation would need to be carefully defined.
3. A 'Householder Obligation' to have energy efficiency work done on their home whenever other building work was being carried out (again, the extent of this would need to be carefully defined), or at the point of re-sale.
4. A 'pay-as-you-save' financing mechanism, with zero-interest loans which stayed with the house if householders moved and which were paid back over 15-20 years through energy bills. There would therefore be no upfront cost to householders of carrying out the energy efficiency work they were obliged to do.
5. Installation of smart meters on an accelerated schedule (and certainly every time energy efficiency work was carried out) to make energy use more transparent. This would need to be complemented by far more transparent and informative billing requirements.
6. A carbon tax imposed from 2012, perhaps at £40 per tonne CO₂ on gas and other fuels used for heating and rising to £100 per tonne CO₂ by 2020 (this would amount to about a 50 per cent increase on current gas prices), to provide a further incentive for people to get the work done (e.g. to do the whole house when they might only have done the minimum). A number of complementary measures (in addition to the energy efficiency programme) could cushion vulnerable households against this increase, as discussed above.
7. Monitoring of energy use post-installation of measures in a representative sample of buildings in order to ensure proper delivery of improved building performance.



Motoring

Similar distributional issues arise for the taxation of motoring as for household energy, but they are less serious. Everybody needs to heat their home, but wealthier people are more likely to own a car, tend to drive it further and tend to have a bigger car. The majority of the poorest households do not have access to a car at all. For these reasons the taxation of motoring is progressive, not regressive.

Fuel duty

Distributional concern is focused on low-income households with cars and in particular those in rural areas, who are felt to have a greater need for a car than people in urban areas. That was stated in the public attitude work of the Green Fiscal Commission as one of the main reasons for opposition to the fuel duty escalator that operated in the 1990s to gradually increase fuel duty in real terms.

Another very important reason that was given for opposition was that the fuel duty escalator was a 'stealth tax', quietly increasing the tax burden on households. However, analysis by the Green Fiscal Commission (see Briefing Paper One: 'Lessons from Two Green Tax Shifts in the United Kingdom') has shown that during the 1990s under both Conservative and Labour governments the additional revenue raised from the fuel duty escalator in some years was almost exactly balanced by reductions in the rate of income tax collected.

Vehicle Excise Duty and car purchase tax

Graduation of Vehicle Excise Duty (VED) based on carbon dioxide emissions was introduced in 2001, following the end of the fuel duty escalator in 2000, for cars registered after that date. Initially, the differential was insignificant, but it has increased over the years. Graduating VED has the weakness in respect of reducing emissions that it does not do anything to discourage unnecessary use.

From 2010 there will be a different rate of VED in the first year for brand-new cars. This rate will be much higher for the vehicles with the highest emissions (Bands H-M), but zero for vehicles with the lowest emissions (Bands A-D). (See Briefing Paper Six: 'Reducing Carbon Emissions Through Transport Taxation' for details)

The effect of these measures on low-income households is small because they are less likely to own cars with high fuel consumption and rarely buy brand-new cars.

A revenue-neutral carbon tax

In the previous section on household energy, the effect was described of an ecobonus in the form of a flat-rate income tax reduction, tax credit or benefits increase for each household based on the number of adults and children living in it. If the revenue from a carbon tax on road fuel was recycled in that way, about 85 per cent of the poorest 20 per cent of households would gain and about 15 per cent would lose, so the effect would be strongly progressive overall.

Congestion charging

Congestion charging was successfully introduced in London in 2003, but it has not yet been implemented elsewhere in the UK – referendums in Edinburgh and Manchester rejected the schemes that had been proposed. There is considerable interest among policy-makers in the potential of a national congestion charging system using satellite tracking technology.

A revenue-neutral congestion charging system offset by a 12 pence per litre reduction in fuel duty could actually increase road traffic in England by nearly 7 per cent and increase carbon dioxide emissions by 5 per cent. The effect of a charge offset by lower fuel duty would be to make urban motoring more expensive, but it would make rural motoring cheaper. Roads in rural areas would experience a significant



growth in traffic. By contrast, a revenue-raising charge would, according to modelling carried out, lead to a nearly 7 per cent decrease in total traffic and an 8 per cent decrease in carbon dioxide emissions from traffic (Foley and Ferguson, 2003).

If the revenue was recycled through tax cuts elsewhere (instead of by reducing fuel duty) then congestion charging would still have an environmentally-beneficial effect. Low-income rural motorists, who usually drive on uncongested rural roads, would generally gain, but a significant number of poorer urban motorists who drive at peak times would instead lose.

Aviation

Aviation currently benefits from a number of tax advantages

- Aviation fuel is exempt from fuel duty,
- There is no VAT on air tickets and Air Passenger Duty (APD) is generally less than what VAT would be,
- Tax-free shopping at airports is a significant benefit which allows higher rents and subsidises airport charges.

The majority of air travel by people from the UK (including most travel on low-cost airlines) is by people in the richest 20 per cent of the population. The average income of air passengers is £48,000 a year (CAA, 2006).

Because people on low incomes fly very little there are no serious distributional concerns about ending aviation's tax privileges. Because with a green fiscal reform additional taxes on aviation would be offset by tax reductions and tax credits elsewhere, a person who flew once a year on a short-haul flight as far afield as Spain or Italy would roughly break even. It would be those who flew more or further than that who would lose, while those who do not fly at all would gain.

An emissions charge on airlines

Aviation fuel's exemption from duty is guaranteed by the Chicago Convention, but it would be possible to introduce an emissions charge on airlines that would be equivalent. There is a case for replacing APD with an emissions charge that would incentivise airlines to use their planes more efficiently.

VAT on airline tickets

If APD were to be replaced with an emissions charge, there would be a case for also ending the zero rate of VAT on airline tickets.

Abolition of tax-free shopping at airports

Decisions about tax-free shopping at airports are a European Union power, so the UK Government could not abolish it unilaterally.

While those attending the deliberative days organised by the Green Fiscal Commission to discuss green fiscal reform (see Briefing Paper Three: 'Public Opinion on a Green Tax Shift' for more details) showed net support for such reform in general, and for increased taxation on home energy use, road transport and aviation to make it possible, there was greatest support for the proposed tax increases on aviation.



Conclusions

It is not controversial to say that the imposition of environmental taxes in general, and the introduction of green fiscal reform in particular, must be 'fair'. The disagreements come in determining precisely what that means.

Fairness to poor people in other countries and to future generations requires that the UK drastically reduces its greenhouse gas emissions that contribute to climate change. The UK Government has adopted challenging emission reduction targets to that end. In order for those targets to be met, energy prices, including energy prices paid by householders, will have to rise substantially.

The fairest and most efficient way in which this can be achieved is through a green fiscal reform that reduces other taxes, with special complementary provisions for low-income and vulnerable households while environmental (especially carbon and energy) taxes are

being increased. In relation to home energy use, an additional essential complement to green fiscal reform is a thorough programme of home energy efficiency improvement such as that suggested above.

Government needs to sign up to a commitment that no-one needs to be cold in the transition to higher home energy prices and a housing stock of vastly greater energy efficiency than at present, and then put in place the necessary mechanisms to deliver on that commitment. Many of the mechanisms are either in place or have been proposed. They now need to be implemented in a robust and joined-up way so that vulnerable people can be affordably warm even with higher energy prices, and emissions from the housing stock can begin a sustained fall towards the reduction of 80 per cent or more that is required by the middle of the century.

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