Balancing act

The implications of transferring policy levies from electricity to gas bills

citizens advice

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Executive summary

The way we heat our homes has a significant impact on our greenhouse gas emissions. Housing accounts for nearly a fifth of all carbon dioxide emissions in the UK, and the main source of this is the use of gas for heating and cooking.

Low carbon alternatives exist, such as the use of electrically powered heat pumps. But the take-up of that technology has been slow, and is discouraged by a range of financial, informational and practical barriers. One of the biggest of these is that it is typically more expensive to run a heat pump than a gas boiler due to the relative price difference between electricity and gas - though customers on innovative tariffs may already be enjoying lower running costs.

Currently, a range of social and environmental policies that seek to encourage low carbon power generation, improve the energy efficiency of homes, and subsidise bills for fuel poor households, are paid for through levies on electricity bills. The Government is considering whether there is a case for moving those levies to gas bills instead, in order to make the electrification of heat more attractive.

Our analysis suggests that such a change would be enough to alter the relative economics of heat pumps versus gas boilers, such that the former would be cheaper to run than the latter. But there would be significant distributional impacts associated with this, as access to the gas grid is less universal than access to the electricity grid.

Around 85% of the population are on the gas grid, and these households would see their bills increase slightly (by around £22/year on average) in order to fund the costs of those off-gas grid users who were now exempt (and saving around £123/year on average). The impacts on fuel poverty are potentially complex, as around four times as many fuel poor households are on the gas grid as off it, but the severity of fuel poverty is deeper in households that are off the gas grid.

As more and more households move off the gas grid, the costs of policy would be spread over the increasingly small number that remain on it. This may not be politically or socially sustainable.

Moving levies from electricity to gas will have knock-on impacts on the relative economics of other low carbon technologies. These may be positive, such as in the case of electric vehicles which should become cheaper to run, and negative, as household solar generation takes longer to pay for its upfront costs.

Running costs are only one of a range of barriers to the adoption of heat pumps. The upfront costs of installation are significant for some homes, the technology is unfamiliar to many, a large number of households do not have control over the heating method for their home, and the process of finding an installer and getting a heat pump installed is currently often more complex than the gas boiler equivalent. These barriers will need to be collectively addressed if we are to enable the electrification of heat. If they aren't, then moving policy levies from electricity to gas may simply redistribute costs without delivering real change to how we heat our homes.

Because not everybody is on the gas grid, there is a fairness question that policymakers will need to address if they decide to move policy levies from electricity to gas. These levies pay for policies that are trying to deliver common public goods - a decarbonised electricity supply, warmer homes, and tackling fuel poverty. Exempting some households from paying towards these aims may be considered unfair, particularly by those who are not exempt. It may be perceived as particularly unfair by those who are unable to act on the incentive to electrify their homes because, for example, they cannot afford the upfront costs.

We explore a range of ways in which the gap in running costs between gas boilers and heat pumps could be closed. None is without downside, and all have distributional implications. We conclude that the fairest approach would be to move the recovery of policy costs from bills into general taxation.

We also note that developments in the retail market may outpace the case for intervention, as specialist tariffs are offered that make heat pumps cheaper to run anyway.

Introduction

What problem are policymakers trying to solve?

The way we heat our homes has a significant impact on our greenhouse gas emissions. In 2022, our homes accounted for 17% of all carbon dioxide emissions in the UK. The main source of these emissions is the use of gas for heating and cooking.[1] The use of natural gas for heating is also the main source of emissions in the public sector, and a significant source in business use.

Technical solutions to decarbonising heat exist, but they are not widespread in their use in their UK. The principal one of these is the adoption of heat pumps.[2] A heat pump extracts heat from an outside source (usually air or the ground) and brings it into the home using electricity. As the electricity we use in our homes becomes increasingly powered by low carbon sources, such as renewables or nuclear, this can provide a more environmentally friendly alternative to using gas for heating.

The Government has set out an ambition for 600,000 heat pumps to be installed each year by 2028.[3] We're currently falling far short of this target, with only ~55,000 purchased last year.[4] Per capita, fewer heat pumps were sold in the UK than in any other major European nation.[5]

There are a range of barriers to households replacing gas boilers with heat pumps, including:

- a typically higher upfront cost of purchasing and installing a heat pump when compared to a like-for-like gas boiler replacement
- higher ongoing running costs when compared to using a gas boiler
- informational barriers, such as a lack of familiarity with the technology and difficulties in finding personalised advice
- agency barriers, such as lacking control (ownership) over the fabric of the home, and therefore over heat purchasing decisions
- implementation barriers, such as difficulties in finding qualified installers

The Government has set out its intention to consider whether the second of those barriers, higher running costs, could be tackled by moving policy costs that are currently recovered from electricity bills onto gas bills. This could simultaneously make running heat pumps cheaper, and running gas boilers more expensive - encouraging a shift to the former from the latter.

What are the levies, and what do they do?

Consumers pay for a range of social and environmental policies through their household energy bills. Most of these levies are currently applied to electricity bills, not gas bills. This is partially because almost every household uses electricity, while only 85% of households are connected to the gas grid, and partially because some of the levies are used to pay for low carbon electricity generation.

It shouldn't be assumed that levies result in higher costs for consumers. This is because they pay for policies that reduce bills. In some cases, those policies are targeted at helping specific consumers in difficulties, such as through the Energy Company Obligation or Warm Home Discount. In other cases, they are paying to accelerate the development of low carbon technologies that have lower running costs than their fossil fuel alternatives, which should benefit all bill payers.

The levies applied to electricity bills are for[6]:

Contracts for Difference (CfDs). CfDs are used to encourage the construction and use of low carbon electricity generation. They guarantee the generator a price for their power output, regardless of the prevailing wholesale price. If the actual wholesale power price is lower than the guaranteed price, consumers will pay the difference. If it is higher, the generator will pay back the difference. During the energy crisis, many CfDs have been paying back, making this a negative levy (a payment to bill-payers, rather than a cost to them).

The Energy Company Obligation (ECO). The Energy Company Obligation (ECO) is a government energy efficiency scheme in Great Britain designed to tackle fuel poverty and help reduce carbon emissions. The costs of ECO are recovered roughly equally between electricity and gas bills.

The Renewables Obligation (RO). The RO was the predecessor to the CfD scheme. The RO required all licensed electricity suppliers to supply a specified and growing proportion of their electricity sales from a choice of eligible renewable sources. Compliance was demonstrated by accruing Renewable Obligations Certificates. New low carbon electricity generation qualified for these certificates, with their value providing a valuable revenue source allowing those plants to be built and operated. That support lasts for 20 years for qualifying projects. The RO scheme is now closed to new low carbon electricity generation, but will continue to provide a subsidy to existing qualifying projects until their 20 year support guarantee has expired.

Feed-in Tariffs (FITs). FiTs were used to encourage the deployment of smaller scale low carbon generation, such as rooftop solar. Consumers installing such technologies could initially qualify for 25 years of support, subsequently reducing to 20 years for later installations. The FiTs scheme is now closed to new generation, but will continue to provide a subsidy to existing qualifying projects until their 20-25 year support guarantee has expired.

The Warm Home Discount (WHD). WHD is a policy that tries to help the poorest households pay their energy bills. It provides an annual fixed discount on electricity bills, paid between October and March. The discount, currently £150 a year, is credited in a single month. Customers are eligible for the WHD if they are in receipt of one of a range of means tested benefits or tax credits. Under the price cap the costs of the WHD are recovered through both electricity and gas bills.

Table 1

The current annual cost of levies on the typical household electricity bill[7]

Policy	Levy on typical household electricity bill, per year	Notes
Contracts for Difference	Varies	CfDs costs can flow in both directions - either adding to consumer bills or reducing them.
Renewables Obligation	£75	
Feed-in Tariffs	£19	
Energy Company Obligation	£19	A further £22 per year is recovered through the typical household gas bill for this policy.
Warm Home Discount	£10	A further £10 per year is recovered through household gas bills for this policy.
Total (excluding CfDs)	£123	

CfDs are not like other levies

As the table suggests, the impact of CfDs on consumer bills is variable in a way that isn't the case for other policy levies. CfDs can either increase bills or decrease them, depending on wholesale prices.

Because of this, CfD levies may sometimes naturally encourage fuel switching from gas to electricity, and sometimes discourage it - depending on whether they are adding to, or reducing, electricity bills at that time. If applied to gas bills instead, the same effect would happen. It wouldn't be logical to move the cost of CfDs from electricity to gas bills if you wish to encourage fuel switching, because of this inconsistent signal.

'Missing' policy costs

Aside from the specific policy cost levies highlighted above, there are three further areas of policy costs that are relevant to the differential in electricity and fuel costs.

The first of these is the UK Emissions Trading Scheme ('UK ETS'). This applies a cost of carbon to the UK power generation sector, but not to household gas usage.

The second is that VAT on energy bills is applied at the reduced rate of 5% for both electricity and gas. It has been argued, including by the EU Commission, that this represents a fossil fuel subsidy.[8] The UK Government disputes this.

The third is that a Bill is currently passing through Parliament that could see the introduction of an explicit or implicit hydrogen levy on energy bills. As amended, the Bill provides for powers to recover the cost of a hydrogen support scheme through gas shippers. This is likely to mean household gas bills rise, as the costs of shippers need to be recovered from their customers. The overall scale of costs associated with the hydrogen levy remain very unclear, although some estimates suggest that it could be similar to the total cost of the levies recovered through electricity bills.[9]

We do not consider UK ETS reform further in this paper, as we do not believe that it is within the scope of the government's considerations on rebalancing levies.

We consider a potential policy option of charging different VAT rates for electricity and gas in the later section on 'Policy Alternatives'.

We do not consider the impact of hydrogen levies on the case for rebalancing policy costs further in this paper as the legislation that may enact them has not been passed, and the questions of both who pays for them and how much they will pay remains very unclear at this time. But, if recovered through gas bills, there is the potential that these levies may significantly increase the running costs of gas boilers, making heat pumps look more attractive.

An evolving picture

Table 1 set out the current level of levies on electricity bills, but this level can and will change over time.

Over the last decade, the cost of levies has increased as a result of significant stimulus being put into decarbonising our power system. But as these technologies become mature, the level of subsidy required has dropped significantly. Indeed, many recent CfDs have been agreed at prices that are below prevailing wholesale prices.

Deflationary pressures on policy costs

The earlier RO and FiT schemes are now closed to new entrants, but guaranteed support to eligible schemes for a number of years. Because of this, those levies will remain in place into the 2030s, although their level will start to drop as contracts expire.

As electricity usage rises with the electrification of heat and transport, the relative proportion of its cost that relates to policy costs may naturally reduce over time (if no new levies are introduced).

The Government is currently consulting on changes to the recovery of legacy costs for the RO that could reduce the cost of the scheme and make it easier to recover its costs through gas bills.[10]

Inflationary pressures on policy costs

If the policy of reallocating policy costs from electricity to gas bills is adopted, the more successful it is in driving consumers to leave the gas grid, the smaller the number of consumers over which policy costs would be recovered. This could mean that consumers left behind on the gas grid continue to face a significant bill for policy costs even if the total scale of those costs declines over time.

A succession of governments have chosen to pay for social and environmental policies through levies on bills rather than through general taxation. If bill levies continue to be the 'go to' approach for funding new policies, it is possible that the current expected decline in policy costs could be halted or reversed.

Who wins and who loses if we move electricity bill levies?

Reducing the running costs of heat pumps

Our previous research has suggested that providing financial incentives to consumers to make their homes net zero ready can increase consumer interest in taking those steps.[11] But that it is not a silver bullet, and that there are a range of other barriers to the adoption of heat pumps.

The upfront costs of installing a heat pump can be significant, and may currently be beyond the reach of many households - a grant scheme has been put in place to try and reduce this barrier, although funding will not be sufficient to help all households.[12] Consumers face informational barriers with an unfamiliar technology and difficulties in accessing personalised advice, and there are currently practical barriers such as finding qualified installers, or the time taken to get one installed (particularly in emergency circumstances where the previous heating system has failed).

Progress will need to be made in reducing all of the barriers if we are to maximise the uptake of heat pumps. In isolation, simply reducing their running costs may not be enough - but we can get a sense of how much they might be changed by moving policy levies.

We can calculate the comparative running costs of gas boilers and heat pumps both with or without moving policy levies from electricity to gas. For the purposes of this comparison, we use the typical nominal efficiency level of a new boiler or heat pump. The actual efficiency level of any given installation could be higher or lower than these figures.

Table 2

The current annual running cost comparison of a gas boiler versus a heat pump, for the average household.

	Annual heat & hot water demand (KWh)	Typical efficiency[13]	Annual energy usage for heat & hot water (KWh)[14]	Average energy price (KWh)[15]	Annual bill
Gas boiler	9430	84%	11226	£0.0689	£773.74
Heat pump	9430	280%	3368	£0.2735	£921.16
Difference					-£147.43

Table 3

The current annual running cost comparison of a gas boiler versus a heat pump, for the average household, *if RO, ECO, FiT and WHD policy costs are transferred from electricity to gas bills*

	Annual heat & hot water demand (KWh)	Typical efficiency	Annual energy usage for heat & hot water (KWh)	Average energy price (KWh)	Annual bill
Gas boiler	9430	84%	11226	£0.0796	£894.04
Heat pump	9430	280%	3368	£0.2279	£767.44
Difference					£126.60

Tables 2 and 3 show the lowest running cost option flipping from gas boiler to heat pump as a result of moving policy cost levies. From costing nearly £150 per year more at present than a gas boiler, a heat pump would become just over £125 per year cheaper. Running cost calculations are highly sensitive to the assumed efficiency of both heat pumps and gas boilers.

Distributional impacts on different consumers

Moving policy levies from electricity bills to gas bills would have a range of distributional effects, creating both winners and losers.

With energy prices as high as they are, some households can ill afford to lose out. The Government will need to find ways to mitigate the impact on the worst affected. In common with many other organisations, Citizens Advice is calling for targeted price support to help low income households afford their bills.[16]

Recovering the same costs from a smaller number of consumers

While access to the electricity grid is almost universal, only around 85% of households are connected to the gas grid.[17] Recovering all policy costs from ~85% of the population rather than 100% of the population would create a small number of large winners, and a large number of small losers.

Those large winners would be the ~15% of consumers who are off the gas grid, who would now be exempt from paying for these policy costs. They would see their electricity bills reduced by around £123 per year, on average. They wouldn't see any increase to their gas bills, as they aren't on the gas grid. So they would be £123 per year better off.

The small losers would be the ~85% of consumers who are on the gas grid, who would now have to pay more, in order to cover the policy costs of those consumers who are now exempt. They would also see their electricity bills reduced by around £123 per year, on average. But they would see their gas bills increased by around £145 per year, on average. In combination, they would be about £22 per year worse off.

The scale of the loss faced by each of the losers is smaller than the win received by each of the winners as there are so many more of them for the costs to be shared over.

The scale of the loss will evolve over time, and will be affected by both inflationary and deflationary factors. Because several of the policy costs relate to schemes that are in their 'run-off' stage, like the RO and FITs, the total volume of policy costs that need to be recovered should steadily erode.

But if the policy of encouraging consumers off the gas grid is successful, then the number of households who have to pay for those policies will also erode. An ever smaller segment of the population would be paying for the total costs of these policies. Over time, we could reach a point at which only a tiny fraction of society is responsible for paying for social and environmental policies. The burden on those consumers could therefore be high, even if total policy costs have significantly reduced.

The extent to which these inflationary and deflationary pressures will cancel each other out is highly uncertain.

Impacts on fuel poverty

There are likely to be complex impacts on the pattern of fuel poverty. Gas is currently a cheaper way to heat homes than electricity, and because of this a greater proportion of households who are off the gas grid are in fuel poverty (20.1%) when compared to those on the gas grid (12.3%). Not only is the incidence of fuel poverty higher for off gas grid households, so is the level of detriment of affected households. The average fuel poverty gap[18] is £804 for off gas grid households, compared to £222 for those with a gas connection.

While the severity of fuel poverty is worse for off gas grid households, the majority of households who are in fuel poverty are on the gas grid, by a ratio of approximately 4:1.

The implications of the above are that moving policy levies from electricity to gas bills would hurt more fuel poor households than it helps, but that those it helped are likely to be struggling more than most.

Table 4

Fuel poverty by gas grid connection, 2022, England[19]

Gas grid connection	Proportion of not fuel poor households within group (%)	Proportion of fuel poor households within group (%)	Number of households (thousands) - Not fuel poor	Number of households (thousands) - Fuel poor	Total number of households (thousands)	Proportion of total fuel poor households (%)	Aggregate fuel poverty gap (millions of £)	Average fuel poverty gap (£)
Yes	87.7	12.3	18,506	2,604	21,110	79.9	577	222
No	79.9	20.1	2,591	653	3,244	20.1	526	804
All households	86.6	13.4	21,097	3,257	24,354	100.0	1,103	338

Geographic implications

While at national level, around 85% of households are on the gas grid, this varies significantly by region from 93% in north west England down to 76% in south west England. Recovering policy costs solely from those on the gas network is therefore likely to result in some regional rebalancing of who pays for policy costs away from regions with lower than average proportions of the population on the gas grid (like the south west, inner London, the east of England and Wales) onto those with higher proportions (like the north east, north west and Yorkshire and the Humber).

Can consumers respond to new price signals?

Consumers will vary greatly in their ability to respond to the economic signal of rebalancing levies. Installing a heat pump involves significant upfront costs. It also requires the consumer to have control over how their home is heated. That control will sit with the property owner. This may cause particular issues for tenants in rented accommodation who have no control over their heating method, but bear responsibility for paying their heating bills.

Because of this, it should not be assumed that all consumers are free to act in response to the signal of rebalancing levies. Many may not be. Indeed, in a cost of living crisis, most may not be.

As highlighted elsewhere in this report, the barriers to the electrification of heat extend beyond running costs. Those barriers will need to be collectively tackled if we are to deliver the mass electrification of heating. For policy to be effective, it will need to recognise the differences in agency - the ability to act - of different groups of consumers, and come up with credible solutions for each group. If it does not, rebalancing levies may simply create windfall winners and losers without changing household's heating methods.

Unintended consequences & knock-on effects

The focus of the debate on moving policy costs from electricity to gas bills has largely focused on its potential impacts on the uptake of heat pumps, but it may have other unintended consequences, both positive and negative.

Electric vehicles

Reducing the cost of electricity is likely to further incentivise the uptake of electric vehicles, by reducing their running costs. For an electric vehicle driver with an average mileage (~4,300 miles per year), the cost of fuelling their car may be reduced by around £63 per year.[20] This would appear to be a positive unintended consequence, though the extent to which it would drive the take-up of electric vehicles is hard to gauge.

High carbon, off gas grid users

There may be potentially more problematic unintended consequences related to consumers who are off the gas grid but who use fossil fuels as their primary source of heating.

A significant minority of the population use neither electricity nor mains gas as their main fuel for heating.[21] Included amongst them are many carbon-intensive heating methods, including heating oil, LPG, house coal and wood. If levies are simply moved from electricity to mains gas, these households would see a reduction in their electricity bills but would not see any increase in their heating bills.

It might be considered unfair, and illogical, for mains gas users to be charged policy costs while users of heating methods that are as high, or higher, in their carbon intensity were exempt.

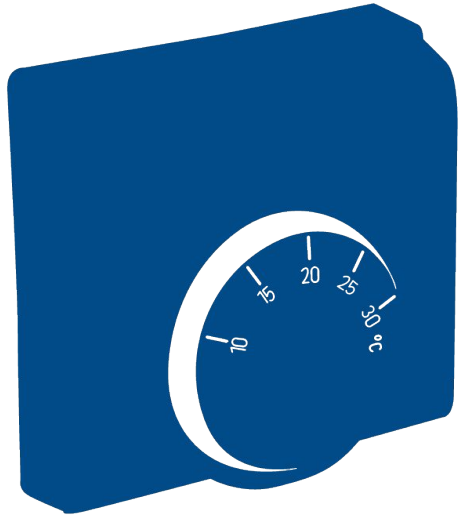
In theory, this loophole could be closed by recovering a share of policy costs from these alternative heating fuels. But this might significantly increase the complexity of policy delivery. It may also aggravate fuel poverty among a cohort of consumers particularly exposed to it - while the proportion of households in fuel poverty in this group is broadly in line with the figures for electricity and gas heated homes, the fuel poverty gap is significantly worse.[22]

Domestic renewable generation, such as solar panels

While moving levies off electricity bills is likely to positively incentivise the uptake of heat pumps and electric vehicles, it may negatively impact the uptake of household microgeneration, such as solar panels.

Consumers can financially benefit from installing solar panels in two ways. Firstly, through the avoided cost of electricity they would otherwise import, and secondly through exporting any excess electricity that is produced which they don't need. By reducing the retail price of electricity, removing levies will also reduce the avoided cost of electricity they would otherwise import. This is likely to mean that it takes longer for the operational savings of microgeneration to pay off the upfront costs of its installation.

For a typical home solar installation, without onsite storage, based on current prices, we estimate that removing levies from electricity bills would increase the time it takes for the panels to pay off their initial installation cost - but only by a single year (from 18 to 19 years). This figure is particularly sensitive to assumptions made on how much of the electricity produced is used onsite, and on the price that is paid for the household for their export.



Energy efficiency incentives

Reducing electricity prices, and increasing gas prices, will change the incentives to make energy efficiency improvements to homes. As with the broader distributional impact of rebalancing levies, this is likely to take the form of a small increased incentive to act for the majority of homes that are heated by gas, and a larger decreased incentive to act for the minority of homes that are heated by electricity.

It is beyond the scope of this piece of work to conduct a sensitivity analysis on how these changed incentives may impact on the overall adoption of energy efficiency measures, but this is something that the government should consider when making a decision on whether to rebalance levies.

The fairness conundrum - and the implications of exempting some consumers from policy costs

There is a fairness question over whether some households should be effectively exempted from these policy costs.

They pay for a range of policies that tackle climate change, and help fuel poor customers.

Climate change affects all of us, and every home and business benefits from the significant ongoing investment in decarbonising our power system that these policies pay for.

Poverty affects fewer of us, but while it's possible to make a case that people should be exempted from paying for policies that tackle it because they can't afford to pay, it seems much harder to make a case that people should be exempted from paying for policies that tackle it simply because they don't have a gas boiler. That would be a non-sequitur - tying two things together that have no real bearing on each other.

In order to make the leap to net zero, policy will need to have public consent. The public will have to buy into the changes that are needed to make it happen. There is a risk that exempting some of society from paying their share, while loading their costs on others, could undermine confidence and buy-in to the transition.

Public perceptions of fairness are also likely to be impacted by whether they can act on an incentive or not. Penalising them for not doing something that is out of their reach - because of financial or other barriers - may not be considered fair. Equally, heat pump owners may consider it unfair that they have 'done the right thing' and are currently being penalised for it. Public attitudes are likely to significantly affect their consent to policy changes, and it would be wise for policy makers to explore them further before taking steps with significant distributional consequences.

Is it possible that the market will solve this problem by itself, without the need for intervention?

Our calculations of the relative running cost of heat pumps and gas boilers in Tables 2 and 3, in common with many other comparisons we have seen, are based on the average prices that consumers pay (based on the price cap).

But consumers don't have to pay those prices - they can shop around. As we were finalising this report, Ovo launched a new tariff offering electricity for heat pump use at 15p/KWh (for comparison, the current price capped rate for electricity is 27p/KWh), making it cheaper to run one than a gas boiler.[23] Other suppliers, most notably Octopus, offer a range of time of use tariffs that can reward consumers for moving their energy consumption to off peak times.

Anecdotal feedback from existing heat pump users on social media suggest that some already calculate that they are saving money when compared to what they would be paying if using a gas boiler.

At present, suppliers can struggle to pass through the financial benefits of load shifting as the central systems used to calculate how much energy their customers have used is based on profiled consumption, rather than the actual consumption in any given half hour. But Ofgem has mandated that from December 2026 all households energy consumption will be based on half hourly data. This should unlock the potential for a much wider range of time of use tariffs.

Given these developments in the retail market, it seems plausible that, through a combination of smart tariffs and load shifting to off peak times, consumers may be increasingly able to run heat pumps more cheaply than gas boilers even without changes to how policy costs are recovered.

Policy alternatives

There are a number of policy alternatives to moving all levies from electricity to gas bills.

A more partial approach

One of these could simply be to move some levies between fuels, rather than all levies. This would dilute the incentive effect to switch fuels from gas to electricity, and would also dampen both the benefits and problems associated with moving all levies.

Because it would reduce the scale of costs reallocated between consumers, it might be more politically possible to enact a change of this kind (eg because those consumers who were worse off as a result of this more partial approach were less worse off than they would have been under an approach where all levies were moved to gas bills).

For a partial reallocation approach to be worthwhile, there would need to be confidence that any incentive effect on fuel switching was still significant enough to encourage the electrification of heating. If it were not, there would be little reason to pursue this approach.

There would still remain the thorny question of which levies should be moved. As highlighted previously in this report, we think it is problematic to exempt some consumers from policy costs on non-income grounds.

Paying for policy costs through taxes rather than bills

Paying for policy costs through taxes rather than bills would also tend to dilute the incentive effect to switch fuels from gas to electricity. This is because while levies would be removed from electricity bills, they would not be added to gas bills.

But it would result in a more progressive recovery of policy costs across society. Recovering costs through bills rather than taxation results in a greater proportion of costs being recovered from lower income households. Moving policy costs from bills to taxation would reduce costs for the majority of households, and the bottom seven income deciles.[24]

Increasing the depreciation rate of gas network assets

The future of the gas distribution networks is uncertain. If society is successful in encouraging the electrification of heat then usage of the gas networks is likely to progressively decline.

This may result in increasing charges for those consumers still connected to the gas network, as the costs of the networks have to be recovered over a shrinking number of users. This should incentivise consumers to switch their heating source from gas to electricity, but may not happen quickly enough to meet net zero targets.

A stronger signal to switch from gas to electricity could be delivered by recovering the capital costs of gas networks more quickly. It could be argued that recovering these costs now while the gas networks are still used by most households would be fairer than recovering them later when the costs would be borne by far fewer users.

But front loading more costs onto today's consumers may not be politically possible, or desirable. Affordability is a major problem in today's energy market, with some analysts projecting that bills may remain elevated far above their historic levels for the remainder of this decade.[25]

Applying different rates of VAT to electricity and gas

Currently, both electricity and gas are subject to the reduced VAT rate of 5%. The application of different rates for electricity and gas could create an incentive effect for fuel switching.

It could possibly be done in a way that did not result in an overall increase in the tax burden, with the cut in the electricity rate and increase in the gas rate generating the same overall level of tax revenues as previously. Equally, it could be used as a tool to reduce or increase overall tax revenues.

The advantages and disadvantages of rebalancing VAT costs between fuels as an alternative to rebalancing policy costs are likely to be similar. Even if the overall level of taxation remains the same as it currently is, recovering more of it from gas users is likely to lead to the same pattern of a small number of large winners but a large number of small losers detailed previously. This may be politically unattractive, and may struggle to win public consent.

Narrower exemptions from costs

Rather than removing policy costs from all electricity bills, it might be possible to only remove them for those households that have heat pumps.

A narrower exemption of this kind could have two key benefits. Firstly, it would result in a smaller volume of costs being redistributed over other households than a blanket electricity exemption would. This may make it more politically possible, by reducing the loss felt by most households. Secondly, it would create an incentive for households who are not on the gas grid but do not have a heat pump to get one. They would only pay a lower electricity unit rate if they did so under this approach.

Similarly, it might be possible to apply targeted exemptions to who pays for policies, in order to protect low income or otherwise vulnerable households. The current framework for identifying those who need help is patchy however, and requires work to ensure that people don't fall between the gaps. We considered these issues in more detail in our recent report 'Closing the gap'.[26]

Electricity retail systems and rules would need development in order to flag which households benefited from exemptions, and to ensure that these exemptions were transferred across if a consumer changed supplier. Price comparison engines would also need to be capable of delivering exempt and non-exempt quotations.

Introducing a carbon price for domestic gas

One way to reduce pollution is to put a price on it that discourages its creation. For example, through putting a tax on greenhouse gas emissions.

The UK has an Emissions Trading Scheme (ETS) in place that encompasses electricity generation but omits natural gas (and other fuels used for heating). Applying a realistic carbon price to domestic gas use could create an incentive to electrify heat, but may be politically and socially challenging in an environment where energy affordability is a major problem.

Several organisations, including the Energy Systems Catapult and the Zero Carbon Commission have suggested ways to try and tackle that affordability challenge, such as through carbon dividends that seek to protect the vulnerable, or the recycling of the proceeds of carbon taxation to help invest in energy efficiency.[27]

Capping the spread between electricity and gas prices

In addition to removing social and environmental levies from electricity bills, NESTA has suggested that the government should set a cap on the electricity to gas price ratio, such that the unit rate of electricity does not exceed 2.5x the unit rate of gas.[28]

They suggest that there are three broad options (which could be combined as needed) that could deliver this:

- taxing the price of gas, to make it more expensive relative to electricity
- subsidising the price of electricity, to make it cheaper
- changing the electricity market to make cheaper forms of electricity, such as renewables, set the market price rather than gas.

As highlighted earlier in this section, taxation options could include altering VAT levels or expanding carbon taxation into domestic heating. We considered the case for reforming price formation in the wholesale electricity market in our recent paper 'Splitting opinion.'[29]

Conclusions

Rebalancing levies by moving social and environmental policies from electricity bills to gas bills would have the following implications:

- Because access to the gas grid is less universal than access to the electricity grid, the same volume of policy costs would be recovered from a smaller number of households. The ~85% of households on the gas grid would see their bills rise, on average by approximately £22/year, while the ~15% of households not on the gas grid would see their bills fall, on average by approximately £123/year. These numbers will evolve over time, both because the financial support provided by some of the policies is time-limited, and because fewer and fewer households will be on the gas grid.
- The impact on fuel poverty will be complex. Around 4x as many fuel poor households are on the gas grid as off it, and they will be slightly worse off. However, the fuel poverty gap is far deeper for households that are off the gas grid. Those households would see significant savings.
- Moving social and environmental policy costs from electricity bills to gas bills would change the comparative running costs of heat pumps and gas boilers such that the former would now be cheaper than the latter.
- It would also change the economics of some other low carbon technologies, in some cases positively, in other cases negatively. The running costs of electric vehicles would reduce, while the breakeven time for investment in solar panels would increase. There may be some impacts on the incentives on households to install energy efficiency measures. It was beyond the scope of this paper to model those impacts, but it is something that the Government should consider as part of any decision on rebalancing levies.
- The barriers to heat pump adoption are much broader than simply running costs though. The upfront cost barrier is significant, and there are also informational barriers, such as a lack of familiarity with the technology and difficulties in finding personalised advice, agency barriers, for example for households who lack control (ownership) over the fabric of the home, and implementation barriers, such as difficulties in finding qualified installers. If these concurrent barriers aren't removed or reduced, there is a risk that rebalancing levies alone will not be enough to drive the electrification of heat, and may simply result in windfall gains and losses to different groups of consumers.

Conclusions

- Moving policy levies to gas would mean that a significant minority of the population would be exempt from paying for a range of social and environmental policies. That proportion would grow over time if the policy was successful in encouraging consumers to abandon the gas grid. It may be perceived as unfair by some that not everybody is being asked to make a contribution towards decarbonising the economy and tackling fuel poverty. Perceptions of unfairness may also exist where consumers are currently unable to make the switch from gas to electricity, for example where they cannot afford the upfront costs of doing so.
- Two of the largest policy costs relate to legacy schemes - the RO and FiTs - that will decline in size over time as the support they provide to older projects expires. As these schemes expire, the reallocated costs associated with them will steadily reduce.
- There are a range of possible alternative policy mechanisms to try and alter the relative economics of heating to make electricity more attractive, but none of them is without drawbacks. All such approaches inevitably involve distributional choices that create winners and losers, making the politics of change difficult.
- In our view, the least worst option would be to move policy costs from bills to taxation. This would result in a more progressive recovery of policy costs, while closing the operating cost gap between gas boilers and heat pumps.
- Developments in the retail market may outpace the case for intervention, as specialist tariffs are offered that make heat pumps cheaper to run even without moving policy costs. The introduction of Mandatory Half Hourly Settlement is likely to make it much easier for suppliers to offer attractive time of use tariffs.

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