

Decarbonising heating at home

Learning from past successes and failures
to improve energy policy making

About this report

When the UK government legislated for net zero emissions by 2050, it accepted the need to decarbonise the way we heat our homes. But doing so will not be easy, practically or politically. This report examines two major policies targeting renewable heat and energy performance in buildings in the UK from the past decade – the Renewable Heat Incentive (RHI) in Great Britain, and the minimum energy efficiency standard (MEES) in private rented housing in England – and offers suggestions to the government on how it can use these experiences to inform new policy.

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Summary

When the UK government legislated for [net zero](#) emissions by 2050, it accepted the need to decarbonise the way we heat our homes. Emissions from domestic heating account for around 14% of UK emissions, most of which is due to natural gas boilers.

This is a hugely challenging policy problem, costing an estimated £200 billion over the next 30 years. It is also politically difficult. While people largely agree with the need to tackle climate change, many do not know that this will mean changes to their homes. Most are happy with their existing heating systems. No politician wants to risk pushing up energy prices, and none relishes the thought of mandating domestic disruption. Success will require carefully designed policies that control costs while delivering both higher energy efficiency and a new heating system to the great majority of the nation's homes.

Recent progress in the area has fallen far short of what is needed. Too few houses are being insulated, and too few households have switched to low-carbon heating technologies.

This report examines two major policies targeting renewable heat and energy performance in buildings in the UK from the past decade: the Renewable Heat Incentive (RHI) in Great Britain, and the minimum energy efficiency standard (MEES) in private rented housing in England.* It asks how the design and implementation of those policies could have been improved, and what the government should take from the experience of these and other past efforts as the scale of its heat and energy efficiency policies ramp up over the next decade.

We identify five key lessons for the government that are relevant to ongoing policy design and delivery. A new heat and buildings strategy is expected imminently, which should eliminate some policy uncertainties. However, all the recommendations contained in this report will be relevant as the government adapts its existing policy and regulatory mix, and consults on and introduces new policies in the coming years.

Learning from the difficulties faced by RHI and MEES, government should:

- **Put implementation at the heart of policy design**
 - Policies can work well only if they are implemented effectively, and for that to happen they must be designed with implementation in mind. This has not always happened in the past. Policy makers in central government must work more closely with the people who implement and enforce policies when designing them. The government's collaboration with local authorities in particular must improve, as local authorities play a key role in enforcing regulatory measures on homes.

* MEES relates to England and Wales, but in this report we focus on the experience in England.

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- **Use more trials and experiments to learn which policies work, and then be ready to scale up**
 - Energy and heating policies have to address huge uncertainties that cannot always be resolved through analysis. More effort needs to be put into piloting, data gathering and monitoring how policies are performing so that government can take action, scale up successful policies and change course when necessary.
 - **Give more sustained attention to the development of technologies, skills and the supply chain**
 - Building the UK's capability to deploy low-carbon heat technologies like heat pumps and other energy efficiency measures is necessary for long-term decarbonisation and should be treated as a core policy goal in itself. The heat decarbonisation and industrial strategy teams in the Department for Business, Energy and Industrial Strategy (BEIS) should work more closely together.
 - **Policy development must be better co-ordinated between key departments, particularly BEIS and MHCLG, but also the Treasury**
 - Ministers in BEIS and the Ministry of Housing, Communities and Local Government (MHCLG) have often perceived a policy trade-off between affordable housing and energy, and as a result energy efficiency measures have not been prioritised within MHCLG. If this government is serious about net zero, it needs a stronger grip from the centre – such as a net zero unit in the Cabinet Office, as previous Institute for Government work has argued for¹ – to ensure that ministers across government take net zero seriously.
 - Within MHCLG itself, recent restructuring has increased the prominence of energy and climate change concerns through a Directorate for Building Safety, Grenfell Response and Net Zero. Given the ongoing problems with cladding and building safety, there remains a risk that net zero will be sidelined, and more needs to be done.
 - If the prime minister and Cabinet Office ensure that both BEIS and MHCLG adequately prioritise net zero housing, then we also see value in mechanisms to ensure that civil servants in the two departments work more effectively together. One promising model is an Office for Zero Carbon Buildings (OZCaB), similar to the Office for Zero Emission Vehicles.

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- **Give BEIS and MHCLG the resources they need to design effective policies**
 - Policy teams in both BEIS and MHCLG need enough support to manage the growing scope of policies for decarbonising heat, commensurate with the raised ambition for decarbonisation associated with the government’s net zero target. This means ensuring policy teams have enough people and money to oversee the successful piloting, monitoring and delivery recommended above. The transition to net zero heating is expected to be expensive – around £200bn – and is likely to involve both large public spending and regulations that drive private sector investment. The relatively small additional costs associated with well-resourced policy teams will be money well spent if they avoid the disappointing and costly policy failures of the past.

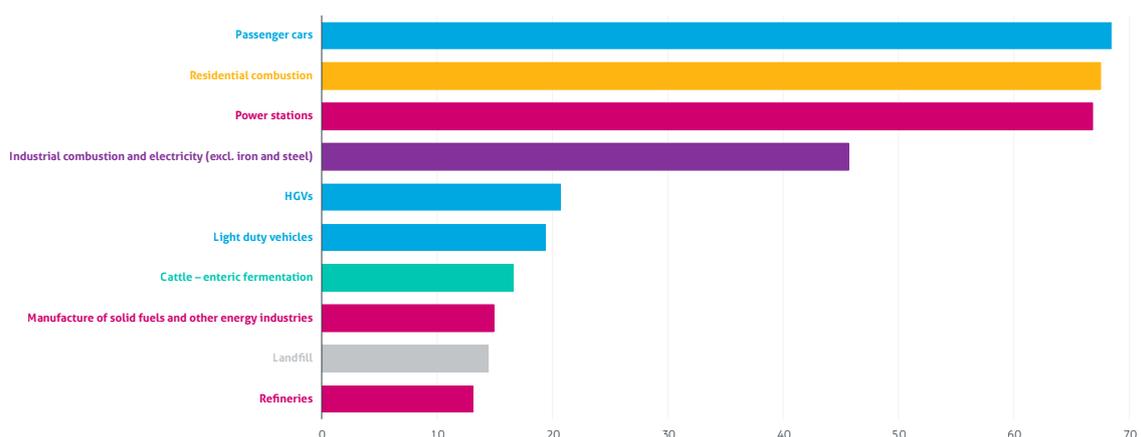
Decarbonising heat is hugely difficult, but the government must do better than it has in the past. There are encouraging signs: the civil servants we spoke to are already taking steps to address some of the issues highlighted in this report, with a stronger focus on delivery and piloting, for example. We found enthusiasm to improve performance and a commitment to learn from what had gone wrong before. The Heat and Buildings Strategy will be a test of that commitment. It will show whether the government is taking seriously both its specific goals on clean heating and its wider climate objectives.

Introduction: the challenge of heat and buildings

Since the UK adopted a 'net zero' target for greenhouse gas emissions by 2050, heat has emerged as one of the single biggest challenges. Nearly a fifth of the UK's total greenhouse gas emissions come from heating buildings, and 77% of that figure derives from domestic heating usually through gas boilers.² Burning fossil fuels for residential heating is the second largest source of terrestrial greenhouse gas emissions in the UK, behind passenger cars.

Providing low-carbon heat will not be cheap, indeed it is expected to be one of the most costly aspects of achieving net zero. UK households currently spend around £30bn every year keeping their homes warm. The Climate Change Committee (CCC) estimates that the total cost of decarbonising that heating will be an additional £200bn between now and 2050 (an average of £6.7bn per year).³

Figure 1 **Top 10 sources of UK terrestrial greenhouse gas emissions in 2019**



Source: Institute for Government analysis of Department for Business, Energy and Industrial Strategy, '2019 UK greenhouse gas emissions: provisional figures', 3 June 2020

It is not yet clear how the UK will achieve net zero emissions in domestic heating. While there is agreement that our homes must be better insulated to waste less heat, there is less agreement about how to replace natural gas heating with a zero-carbon alternative. Some experts advocate heat pumps – a highly efficient form of electric heating widely used elsewhere in Europe. The downside of heat pumps is that they are more expensive to buy than a gas boiler, and installing them correctly can mean disruptive changes such as new radiators. A possible alternative is for people to continue to use boilers, but with a low-carbon gas such as hydrogen instead of natural gas. This involves much less disruption for consumers, but would require four to six times more energy, creating enormous difficulties for the deployment of sufficient energy supply, whether offshore wind, nuclear or natural gas with carbon capture and storage.

The government has successfully developed the option of hydrogen as a heating technology, through a series of technology demonstration programmes. But the long-term prospects for hydrogen remain uncertain. It is likely that, even if hydrogen plays a role, successful electrification (through heat pumps) and energy efficiency measures will also be essential drivers of decarbonisation.⁴ The government has set itself ambitious targets including the installation of 600,000 heat pumps per year by 2028, up from just 27,000 installed in 2018.⁵

There has been little progress over the past decade at driving efficiency and the development of a heat pump market. Emissions from buildings fell 13% between 2008 and 2018, but most of this happened before 2015, driven by the regulated phasing out of non-condensing boilers and their replacement with more efficient condensing boilers. Other policies supported the uptake of loft insulation in more than five million homes between 2008 and 2012.⁶ Since 2015, progress has been “negligible” according to the CCC.⁷ In July 2019, parliament’s Business, Energy and Industrial Strategy Select Committee concluded that the government “is off-track to meet its targets” and that “major policy gaps still exist”⁸ on energy efficiency. The policy picture over the past few years is therefore largely one of failure.

Progress has been hampered by the sometimes difficult politics of heat decarbonisation as much as by policy failures. Despite widespread public support for action on climate change, relatively few people understand the required changes to their own homes, and politicians have balked at forcing people to renovate. In 2012, a policy requiring upgrades to the energy efficiency of a home when undertaking major renovations was quickly abandoned when headlines described the policy as a ‘conservatory tax’.

The politics are made even more difficult by the scale of the investments – and the correspondingly large potential impacts on energy bills – that decarbonising heat will require. When residential energy prices rose around 2010–13 and Ed Miliband, then the leader of the opposition, called for a price cap, the resulting political pressure famously resulted in David Cameron, the prime minister, seeking to “get rid of the green crap”. The “green crap” that so worried him included incentives for energy efficiency that were seen to be driving up prices, despite analysis showing that these policies lowered bills in the long term by reducing energy demand.

But there have also been clear cases of policies that simply did not work. The coalition government’s flagship policy for energy efficiency in existing homes was the Green Deal, launched in 2013. It was a spectacular failure and has been widely covered elsewhere. Similarly, Northern Ireland’s version of the Renewable Heat Incentive [brought down a government](#) and wasted millions.

More recently, the Green Homes Grant – launched in 2020 as an attempt to combine post-Covid economic stimulus with energy efficiency and heat policy – has been abruptly cancelled after complaints about excessive bureaucracy and a time frame so short that some businesses saw no value in investing in capacity to meet a short-term increase in demand. While the most recent data shows that it had started to deliver a real short-term boost to the decarbonisation of homes, it was badly undermined by poor delivery and an over-optimistic timescale.

It will be essential to dramatically speed up the decarbonisation of domestic heat over the next decade. The UK cannot afford more years of negligible progress if it is to meet the net zero target.

The focus of this report is how government can avoid such policy failures in future, by learning from past experience. It draws on detailed case studies of two domestic heating and efficiency policies from the past decade – the Renewable Heat Incentive (RHI) in Great Britain, and the minimum energy efficiency standard (MEES) regulations in the private rented sector in England – as well as on observations of other policy developments in the area. In writing this report, we revisited policy documents from the design of the RHI and MEES and subsequent evaluations, and interviewed dozens of people in government involved in their creation and subsequent delivery, as well as current civil servants working on heat decarbonisation and energy efficiency. We also spoke to relevant people in industry, academia and local authorities.

After laying out the policy case studies in brief, we set out some lessons that the government should draw from their performance to help design and deliver the policies needed to substantially decarbonise domestic heating in the next decade.

Learning from the 2010s: the Renewable Heat Incentive and minimum energy efficiency standard as case studies

The domestic Renewable Heat Incentive in Great Britain

Design of the RHI

The domestic Renewable Heat Incentive (RHI) is a tariff scheme designed to support and reward the uptake of a variety of renewable heating technologies – namely air and ground source heat pumps, biomass boilers and solar thermal – among householders across Great Britain. It was opened to applications in 2014, and the domestic scheme will close to new applicants in 2022. The scheme in GB is different to the parallel RHI in Northern Ireland.

The policy was designed in the early years of the coalition government as part of the UK's response to the legally binding renewable energy targets under the EU's Renewable Energy Directive (RED). The UK's RED target was agreed by the Blair government in 2007, and it was ambitious: renewable energy would make up 15% of the UK's energy needs by 2020, a very substantial increase. A second objective of the RHI was to “[lay] the foundations for mass deployment [of renewable heat] in the 2020s”⁹ through innovation and the development of a domestic supply chain.

The scheme was designed as a tariff, funded directly from taxation as annually managed expenditure.¹⁰ Participants in the domestic RHI receive tariff payments per unit of renewable heat produced, usually determined through ‘deemed’ (estimated) heat demand. Applicants are paid a set price for seven years. This tariff-based approach to subsidising heat had not been used previously anywhere in the world, and part of the reason for this design was the pressure on public budgets during the coalition government. The tariff structure spread the costs of the scheme over decades, whereas an alternative up-front grant would have had a bigger impact on public spending at a time when government was focused on austerity. Even so, the policy was expensive: the combined domestic and non-domestic RHI were expected to cost £47bn when the policy was first designed,¹¹ though this was later reduced in light of poor take-up.

The scheme's design was also heavily influenced by the feed-in tariff (FiT) for solar electricity, a policy with a broadly similar design that experienced severe cost overruns, as demand for solar panels was far higher than anticipated. In light of that experience, and despite enthusiasm from the then secretary of state, Chris Huhne,¹² the launch of the domestic RHI was delayed from 2011 to 2014 over fears of what one civil servant called “a solar FiT death spiral”¹³ – a subsidy scheme running out of control because no cost controls were put in place.

Huge effort was put into identifying the precise tariff level and cost control system that would incentivise renewable heat deployment but not over-reward it. Officials wanted to compensate consumers for the additional costs associated with the renewable heating system over a fossil fuel alternative, but not do more than that. They also designed a system known as 'degression', by which the tariff rate for new applicants declined over time according to clear criteria. The emphasis on cost control in the GB scheme is a notable difference from the related RHI scheme in Northern Ireland, which led to the 'cash-for-ash' scandal in which recipients were incentivised to heat even unused buildings since the subsidy payments exceeded the costs of heating. The resulting boom in applicants cost an estimated £490m, and the scandal brought down the Northern Ireland executive in 2017.

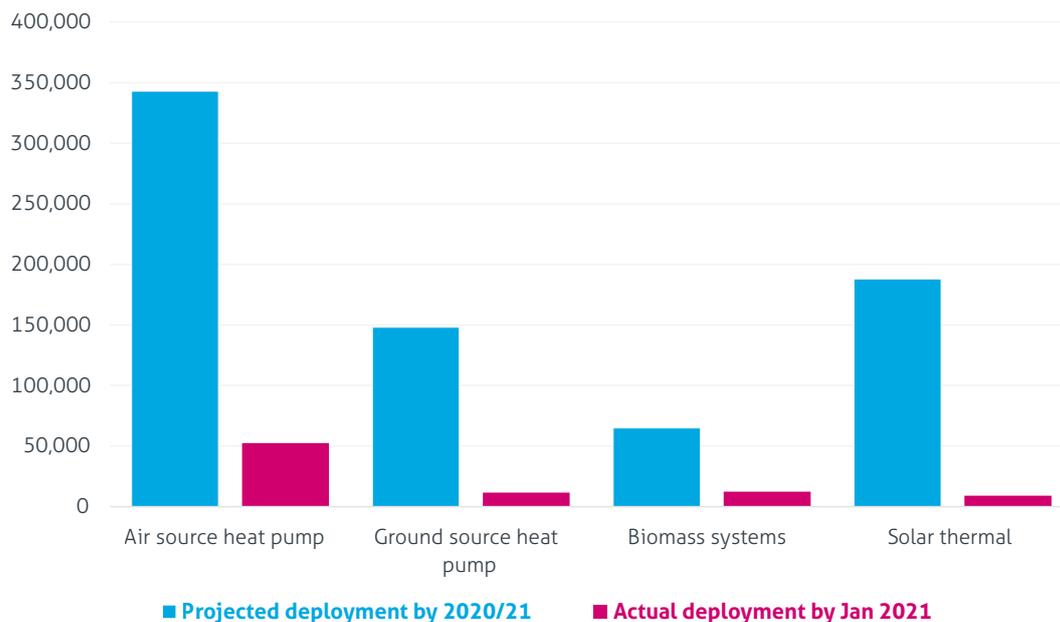
Impacts and criticisms of the scheme

After the launch of the RHI in GB, it became clear that the policy was successfully deploying biomass boilers, but was leading to lower than expected uptake of heat pumps. This mattered: it was increasingly recognised that biomass was not an important long-term option for decarbonising domestic heating. While the RHI was meeting the objective of deploying renewable heat, it was not contributing to a longer-term pathway for decarbonising heat.

A series of reforms to the scheme between 2016 and 2018 tried to address this, and other problems with the scheme. The government increased some tariffs, introduced more metering options and allowed payments to go to a third-party investor to increase access to private finance. The reforms were a modest success, and as of December 2020, air and ground source heat pumps made up 75% of renewable technology installations, and 66% of installed renewable energy capacity.*¹⁴ Despite these changes, the impact of the RHI on UK deployment of renewable heating in general, and heat pumps in particular, has still been much lower than the government initially hoped it would be.

* Biomass systems tend to be in larger properties using more energy, which explains the discrepancy between the proportion of installations made up by heat pumps and the proportion of renewable energy they produce.

Figure 2 **Numbers of renewable heating systems deployed through the RHI**



Source: Projected deployment taken from the Impact Assessment published in 2013; Actual deployment data from BEIS RHI statistics.

A further criticism of the RHI focuses on who received taxpayer support through the scheme. Recipients were often those with large houses (and hence heat demand), and the resources to pay up-front for the renewable heating installation. As Amber Rudd, former secretary of state at the Department of Energy and Climate Change (DECC), put it: “When they explained it to me, I sat there saying ‘who gets these things?’ [and] I was shown all these amazing country houses. And I said these are not people who need taxpayer support.”¹⁵

The RHI was not exactly a failure. It was an ambitious and innovative policy approach that successfully avoided the cost control problems that have plagued other tariff schemes in energy policy, and it drove a real increase in the UK’s renewable heat. But on the simple metric of comparing the expectations at launch to the reality, the RHI can only be seen as an expensive policy that delivered hugely disappointing results: renewable heat delivered in 2020 was less than a third* of the projected total when the policy was introduced. It was also expensive. In its report on the RHI in 2018 the National Audit Office (NAO) found that, per unit of heat delivered, the cost of the scheme was likely to be up to 30% higher than had been initially anticipated, though it emphasised the uncertainty in the estimate. The NAO concluded that BEIS had “not achieved value for money”.¹⁶ The reforms made between 2016 and 2018 rescued elements of the RHI, but the UK market for heat pumps has not been transformed in the years since 2014, and although progress has been made shifting off-gas grid homes on to decarbonised heating systems like biomass boilers, this is only a modest achievement.

* 30% – based on projected renewable heat deployment of 3.9TWh in the 2013 impact assessment, and delivered heat of 1.19TWh, based on BEIS Renewable Heat Incentive statistics.

Minimum energy efficiency standard in England

Rented properties are a particular challenge for heat and efficiency policies, because of 'split incentives'. The financial benefits of energy efficiency upgrades accrue to home occupants (in this case tenants) rather than owners, but tenants – particularly with short tenures – have little incentive to invest in measures that may take several years to pay back. This barrier is commonly cited as the key reason for chronic underinvestment in energy efficiency in privately rented properties, and helps to explain why privately rented homes tend to have lower energy efficiency ratings than other tenures such as socially rented or owner occupied.¹⁷ The minimum energy efficiency standard (MEES) is a direct response to this market failure.

The MEES regulations were first conceived in 2010, alongside the Green Deal, the flagship environmental policy of the coalition government that aimed to give homeowners access to finance to pay for energy efficiency upgrades to their properties, paid back through savings on energy bills.* The regulations were finalised by the incoming Conservative-majority government in 2015, and stipulated that all privately rented homes in England had to reach a minimum energy efficiency standard by 2018 for new tenancies, or by 2020 for existing ones. The minimum standard was based on energy performance certificates (EPCs, see Box 1), and required that rented homes reach a standard of E (on a scale of A to G). The idea was that landlords could use loans through the Green Deal to pay for the upgrades. The loans were to be repaid by tenants, who would in principle still benefit through lower energy bills.

The regulations were designed to avoid imposing costs on landlords: renovations were required only if they came at no net cost and no up-front cost to the landlord. If a Green Deal loan – or other source of support such as grants from local authorities – was shown to be unavailable, landlords were exempt from the MEES requirements. Enforcement of the regulations was assigned to local authorities.

The powers behind the MEES regulations were set out in the Energy Act 2011, which also established a maximum fine of £5,000 for non-compliance if a landlord failed to bring their F- or G-rated property up to at least an E rating without a valid reason for exemption. According to a 2015 impact assessment, the government believed that MEES would bring 73% of F- and G-rated properties (a group of 360,000 homes) up to an EPC E rating by 2020.¹⁸

* A unique financial instrument, the Green Deal had no traditional debtor. Instead the balance of the loan was attached to the property, regardless of the tenant.

Box 1 **Energy performance certificates (EPCs)**

Energy performance certificates, introduced in 2007, are a rating system for houses and other buildings that score properties from A to G based on an estimate of their energy running costs for heating, hot water and lighting. An EPC rating of A indicates a very cost-effective property to run in terms of energy costs, while a rating of G would indicate a very inefficient or expensive to run property.

The intention of EPC ratings is to give a standardised assessment of expected energy costs for any given property, and the likely savings from installing energy efficiency measures. The system is a means of comparing assets – houses – on the basis of whatever energy efficiency measures they have in place, not on the basis of the actual energy use of current occupants.

Government targets to improve the energy efficiency of the UK housing stock are set out in terms of target EPC ratings – for example, bringing all properties up to a minimum EPC C rating by 2035 where this is cost-effective, practical and affordable (a target set out in the 2017 Clean Growth Strategy).¹⁹

EPC ratings have been criticised as a flawed, often inaccurate proxy for real-world energy efficiency. Confidence in them is low: in a recent consultation, only 3% of respondents said that reliability of EPCs was 'good'.

MHCLG, the department responsible for EPC ratings, has accepted there are problems with the quality of EPCs. In a recent 'EPC action plan', BEIS and MHCLG are seeking to address the robustness and accuracy of EPCs. The plan highlighted "assessor competence" as a key area for improvement²⁰ – recognising that different EPC assessors sometimes give very different ratings to the same property.

The quality and reliability of EPCs will become increasingly important in the coming years, as minimum energy efficiency regulations tighten and EPC ratings begin to seriously affect property values. MHCLG and BEIS need to accelerate progress on the EPC system, by following up on the action plan and making increased use of the opportunities created by real-world monitoring, including through smart meter data.

Impacts of the scheme

MEES was designed to be dependent on the Green Deal, which was expected to provide finance for landlords for energy efficiency upgrades. This became a major flaw. Even before the regulations were finalised in early 2015, it had become widely accepted that the Green Deal was not working. Just days after the government closed its consultation on the first phase of MEES, the Commons Energy and Climate Change Committee described the Green Deal as “failing”.²¹ By late 2015, the government had withdrawn financial support for the Green Deal, and it closed to new applications.

As a result, the MEES regulations as initially designed were ineffective: landlords could obtain an exemption by demonstrating that a Green Deal loan could not cover the necessary upgrades. The regulations had also been premised on optimistic assumptions about tenants. Government statistics show that in 2015, 45% of households in rented F- and G-rated homes were in fuel poverty,²² yet the policy required these households to accept liabilities for debt attached to their residence.

In 2017, two years after establishing the regulations, the government recognised that the scheme was ineffective, and announced that the ‘no net cost’ rule was to be abolished in a revision to the MEES regulations.²³ In its place, the government introduced a cost cap of £3,500. Landlords were obliged to make energy efficiency improvements up to that value but were exempt if further improvements to bring the property up to EPC E would cost more than £3,500. Even with this change, in a 2018 impact assessment, the government revised down the proportion of F- and G-rated properties it expected to bring up to EPC E by 2020 from 73% in 2015 to 48%.²⁴

A second major weakness of the policy design relates to enforcement, which turned out to be much harder for local authorities than had been assumed. In 2019, a year after the regulations came into force, it was clear that little enforcement activity was taking place.

The original design of MEES was inadequate, and expectations for it were far too optimistic. However, there is evidence that the policy is now having an effect, following the revisions in 2018 and efforts to support local authorities with enforcement. An evaluation published in 2021 suggests that the policy is driving upgrades in the least-efficient rented properties.²⁵

Another round of reforms to the MEES regulations is expected soon. According to a 2020 consultation, the government is likely to raise the cost cap to £10,000 – a potentially important step, given that the lower cost cap was seen as one of the primary inhibitors of greater progress. The government will also set out a trajectory of tightening regulations for landlords to prepare for. The consultation suggests the regulations will require an EPC rating of C by 2025 for all new lettings and by 2028 for all existing tenancies.

Lessons for government for the next decade

Reflecting on the RHI and MEES policy design processes, and on the basis of conversations with industry and academic experts and local government officials, as well as civil servants, politicians and their advisers, we make the following recommendations for the next decade of heat and energy efficiency policy.

Implementation and enforcement must be at the heart of policy design

Policy implementation and enforcement must be taken more seriously at the policy design stage: key delivery partners including local authorities should be invited to play a stronger role in shaping policies as they are designed

Meeting, rather than setting, targets will be the focus of the 2020s when it comes to energy and climate policy. Setting intermediary goals and designing policies to meet them remains vital but, as the Climate Change Committee and many others have made clear, it is essential that we see a firm move from rhetoric to reality on the uptake of low or zero emission technologies this decade.²⁶

Increased policy and regulatory ambition is welcome, but successfully delivering an economy-wide transformation is about more than increased budgets and central government focus. This is particularly true in heat policy, where decarbonisation may involve millions of individual domestic decisions across the country, supported by a combination of direct government financing and private capital mobilised by clear regulatory signals.

If the government is serious about hitting its targets for energy efficiency and renewable heat installation (both of which are rightly much higher than their respective markets are currently able to deliver), it will need to improve its understanding of what implementation and enforcement looks like on the ground.

The MEES regulations offer a telling example of the failure of central government to engage sufficiently with delivery bodies to understand likely difficulties at the design stage. This is particularly critical for regulatory policies, which, to send clear messages and introduce the right incentives, need to be widely understood and properly enforced.

MEES met neither of those criteria. Enforcing the regulations proved difficult for most local authorities, which lack the resources to spend time finding and pursuing landlords in breach of energy efficiency standards. Local authorities in England often lack basic data on which properties in their area are privately rented. Local authority interviewees we spoke to told us that the officials responsible for enforcing the regulations often worked in teams that had been cut to as low as 10% of their pre-austerity size, and that "local authority officers worried about catastrophic failure are not going to prioritise their marginal resource on this stuff".²⁷

Given resource constraints, local authorities we spoke to argued it would have been helpful for the MEES regulations to have been better aligned with the Housing Act 2004, which established the housing health and safety rating system (HHSRS) and includes minimum warmth standards. The delivery environment is complicated by the internal structure of local authorities: HHSRS is managed by environmental health departments, while trading standards departments enforce requirements for landlords to have an EPC in place. Which team enforces MEES is left to local authorities, but the resulting separation of roles is unsatisfactory,²⁸ especially in non-unitary authorities in which environmental health is lower tier, while trading standards are an upper tier responsibility.

Early policy documents show that discussions with local authorities – the key delivery partner for MEES – were extremely limited. The working group, formed in 2013 to consider the form the regulations would take, included just one local authority representative, along with the Local Government Association (which, records shows, attended only one out of seven meetings).^{*} Local authorities we spoke to felt that civil servants had not taken the time to understand enforcement challenges, and that part of the problem was high turnover, particularly within MHCLG, and a lack of communication within central government. One local authority officer told us: “I have 30 years’ experience of enforcement. Most civil servants I encounter haven’t got 13 months doing it in MHCLG.”²⁹ Another highlighted a perceived “disconnect” between different departments, or teams within departments, which made it harder for local authorities to communicate clearly with central government.

Good engagement is not simple, and it should be recognised that things have improved since 2018. BEIS has now funded a series of enforcement pilots, which local authorities told us were valuable, and BEIS is also developing an enforcement toolkit to help local authorities with enforcement challenges. But many problems with enforcement remain, and these problems could have been predicted and acted on much earlier – when the regulations were being designed – by a department committed to a stronger relationship with the people charged with implementing its policy decisions.

We heard from ex-BEIS officials that the attitude in central government had been blasé when MEES was being developed in 2013–15, and that enforcement had not been considered a priority “because people tend to comply with the law”.³⁰ This is a strikingly relaxed attitude but it was confirmed by a participant in the government’s stakeholder working group on MEES in 2013, who said the government’s “assumption was that landlords would behave”. This assumption was misguided, in part because at least initially the regulations were not well understood by landlords. Data collected in 2018, the year in which MEES first came into force, showed that 35% of landlords had never heard of the MEES regulations.³¹

Private sector landlords are a difficult industry group for central government, whether in BEIS or MHCLG, to speak to. Most landlords own a small number of properties (one to three), and fewer than 15% are members of a landlord association.³² Local authority

* Minutes of all meetings of the Advisory Working Group on Domestic Private Rented Sector regulations, which were held monthly from February to August 2013, were published by the Department of Energy and Climate Change.

knowledge of its housing stock and rental market is therefore essential, although building a clear picture is even difficult at a local level, particularly in England, which, unlike Scotland and Wales, does not have a national landlords register. One civil servant in MHCLG told us:

“The data we have is not sufficient to understand [landlords’] basic business models, let alone their short- or long-term motivations. We are all too reliant on anecdote... it is one of the very significant challenges in understanding what level of cost would motivate someone to leave the sector [the key reason stricter regulations are often shied away from].”³³

Greater dialogue is not a total solution. Taking implementation and enforcement seriously at the policy design stage can also involve other methods of building a clearer picture of the delivery environment, like regulatory sandboxes or local pilots, both of which are discussed in the next section.

But bringing delivery partners into the policy design process early, and recruiting staff with skills developed through experience ‘on the ground’, is still a valuable practice that BEIS and MHCLG could do more of. The lessons that apply to properly understanding the problems local authorities face apply just as well to other delivery partners, like Ofgem.

Government needs to act, learn and adapt all at once

Energy and heating policies have to address huge uncertainties that cannot always be resolved through analysis. More effort needs to be put into piloting, data gathering and monitoring how policies are performing so that government can take action, scale up successful policies and change course when necessary

Heat policy is plagued by uncertainty about the likely responses of consumers to various incentives, and the performance of technologies and systems as they are adopted. One response to uncertainty is better evidence and analysis to inform policy design.

This is certainly important. In the past, there have been examples of government failing to collect the relevant evidence. The notoriously ineffective Green Deal has often been criticised as having been insufficiently informed by social research and evidence on the likely level of consumer demand for the novel financial instrument being created.^{34,35} With MEES, a policy targeted at the private rental sector, the government appears to have made assumptions about how tenants would respond to being asked to accept repayment liability for a loan taken by their landlord, with little attempt to understand the tenants’ perspective.³⁶ On the RHI, in evidence given to the Public Accounts Committee in 2018, BEIS acknowledged that it had done too little to understand how consumers would respond to the high up-front costs of heat pumps.³⁷ We also heard that not enough attention was paid to the fact that low-carbon heating systems are rarely a like-for-like replacement for a boiler, and that information on costs and consumer willingness to pay was weak.³⁸

But even when they are informed by the best available evidence, some of the assumptions made by government will turn out to be wrong. Consumers may fail to respond to incentives in the way predicted, or technologies might cause problems in practice that had not been anticipated. That means that government must be ready to learn from policy implementation. One official in a senior analytic role at MHCLG argued that government should consider every policy to be “a hypothesis, with a theory of change that you can test and learn from when something doesn’t work”.³⁹

In designing the RHI, the department commissioned detailed analysis, including social research, to inform the design of the tariff system. Nevertheless, BEIS overestimated consumers’ willingness or ability to pay the large up-front costs of renewable heat technologies, particularly heat pumps. The research and analysis prior to policy implementation was no substitute for piloting.

BEIS did make efforts to adapt the RHI in light of experience, as it became clear that it was largely delivering the deployment of biomass systems. The ‘degression’ system cut tariffs for biomass, and in 2018 BEIS implemented changes to the scheme to further support heat pumps. But part of the problem was the policy design itself: the disappointing results of the RHI suggest that a tariff system was not the best mechanism to drive widespread adoption of unfamiliar technologies with high up-front costs. Given the constraints of the basic policy design, one senior official told us that the tweaks made to the tariffs were like “trying to manage your [romantic] relationship through minute adjustments to your flower budget”.⁴⁰ In other words, more fundamental changes were necessary. Many officials we spoke to now agree that a scheme involving capital grants would likely have been more effective – and that this could have been revealed with piloting.

Piloting can help understand what works and what does not in real time

We heard from interviews at BEIS that not enough had been done to pilot the RHI, but that there is now a greater willingness to test policies. One official told us: “Our biggest [lesson from the RHI] is the piloting process. The thing that has really changed is the willingness to acknowledge we might not want to design a huge scheme from the outset, but put money into smaller projects that can be scaled up.”⁴¹

However, even when civil service policy makers favour piloting a policy in principle, it can be “difficult politically because politicians like doing stuff”.⁴² Ministers seeking to make an impact would often rather launch a bold initiative than pilot one and risk seeing their successor take the credit. The desire to make an impact is understandable but can be damaging: ministers must recognise that bold action based on limited real-world evidence is high risk.

It can also be difficult for officials to articulate and justify the value of resource spending focused on learning and improving policies once they are in operation, particularly if the idea is to trial regulation. One civil servant told us:

“It is difficult to put a value on learning in an impact assessment – indeed with regulatory policy, it’s very hard to get away with the idea that you don’t know something, so you want to learn. The pace of net zero means... we need to learn as we go, but it is hard to make the case that experimentation in regulatory policy is desirable.”

The result is that policy officials feel frustrated. They know that more time and effort to learn from policy implementation and piloting would be valuable, but they struggle to find the resources necessary. The examples explored here show how important piloting can be in avoiding costly failures of policy design.

Piloting ultimately creates fewer delays than poorly designed or rushed policies

Piloting can also slow down delivery – or even be used to delay taking difficult decisions. As one senior figure in BEIS put it:

“There’s a tension between relentless delivery focus – this is the rhetoric rising on the BEIS side, turning ourselves into a delivery department – and the continued investment in evidence, monitoring, evaluation and policy making. The counter-argument [to piloting] is that we need to go all or nothing for 2050 or we won’t make it. If it’s seen as a competition between [delivery and evaluation] then one side will always win – delivery.”⁴³

In a sense, that attitude is the right one. In a genuine competition between delivery and evaluation, delivery should be the government’s priority. But in most circumstances, the reality of that tension is less clear. Mistakes with large schemes can be costly and ultimately result in much longer delays to policy delivery than piloting would. As one former DECC civil servant told us:

“If we’d trialled the Green Deal we might have fixed it, but instead we went out with a huge national scheme which ultimately set energy efficiency in this country back five or ten years... We lost a lot of time, much more than a year or two of piloting would have taken.”⁴⁴

More recent experience with the Green Homes Grant points in the same direction. Superficially, a smaller scheme with a higher focus on learning from deployment and scaling up might have looked like sacrificing delivery in favour of evaluation and learning. But in reality, the scheme as designed was overambitious. It fell well short of the headline-catching, multibillion-pound announcement, and was cancelled at short notice.

Where piloting is not possible or desirable, it is even more essential that data is collected alongside implementation and used to make policy making more agile

Policies have not always been accompanied by efforts to collect relevant data and learn quickly from experience, and data held by government has not always been used effectively to quickly identify problems with the policy or mistaken assumptions.

In the early years of the implementation of the MEES regulations, relevant data was simply not collected. Levels of compliance were highlighted in the impact assessment as a key uncertainty in the policy, so the working group of external stakeholders consulted during the policy's development recommended "reporting mechanisms for central government to monitor and provide feedback on the levels of compliance."⁴⁵ But despite the government saying, in 2015, that it "considers it important to learn from the experience of implementing these [MEES] regulations",⁴⁶ the processes first put in place to monitor compliance were weak. In 2020 the government consulted on a compliance database, recognising that the data previously available had been "insufficient or unsuitable for comprehensive compliance monitoring",⁴⁷ and has now developed a more robust approach to monitoring and evaluation.

On the RHI, the NAO reported that while some evaluative measures like the benefits tracker and monthly statistical releases on deployment were effective, no specific metrics were set to measure supply chain development, and the only metric linked to quality of installation is a customer satisfaction survey.⁴⁸

To improve, both the BEIS and MHCLG need to be better at identifying data collection needs before policy implementation. One senior BEIS official we spoke to agreed, arguing that: "Investing in this stuff ahead of a scheme going live is essential. It's hard to backwards-engineer. We're struggling with the recognition that delivery, evaluation and evidence require you to put things in place before you press go."⁴⁹

Meanwhile, the RHI also illustrates that even where BEIS has collected data, it has not always done so effectively, or made best use of the resulting data. When the domestic RHI was initially delayed in 2011, a smaller incentive scheme was launched to collect data and pilot elements of the tariff system – the renewable heat premium payment (RHPP) scheme. Although civil servants involved at the time told us its purpose was to "keep the [heat pump] industry alive" because the delay to the domestic RHI had come as a shock, it did use heat metering (measuring actual use rather than 'deemed' use) to build a dataset on how households used renewable heat technology once installed.⁵⁰

The RHPP scheme produced data on heat pump performance, and that data has been valuable to BEIS. However, we heard that weaknesses in the design of monitoring and data collection related to the RHPP prevented a thorough analysis of why heat pump performance was so varied.⁵¹ This is important: differences in heat pump performance, scaled up across millions of homes, could be the difference between needing to build a new nuclear power station or not. The RHPP data collection process missed an important opportunity to understand why heat pumps perform so differently in different buildings.

Similarly, a mechanism was set up to collect additional data on the performance of heat pumps installed under the RHI, called the metering and monitoring service package (MMSP). We heard that the department was failing to use the data effectively: “[Using the data from MMSP is] not anyone’s top priority... but it is half hourly data that could give a better sense of how heat pump use affects peak demand... Current models still use [2012-13] RHPP data.”⁵²

BEIS needs to do a better job at designing good data collection from the outset, and making good use of the data that is collected.

Data produced in policy delivery can be valuable to the private sector as well as to government. BEIS should also make use of the opportunities presented by its data collection to improve the market for critical renewable heat technologies like heat pumps. One official we spoke to remarked on the opportunity presented by the Green Homes Grant: “It is an exemplar of [collecting] data from the outset. It’s amazing how much data we have now from Simple Energy Advice [the government’s independent consumer advice service for energy]: on where in the country people want measures, on how many suppliers there are in each area...”⁵³

That this kind of data was being collected and recognised is good news and suggests that government has learned some of the lessons from the RHI and MEES. The next vital step is putting that data to good use.

This means that policies need to be agile – able to be scaled up quickly, and to move in a different direction when required. Clearly smaller pilots or experiments lend themselves to this most readily, but larger schemes should not be immune to flexibility. Policies need to be designed so that data generated flows back to decision makers to make adjustments quickly when things are not working as they should be.

The department should also be open to innovative policy design tools like ‘regulatory sandboxes’, which allow selected firms to conduct live experiments with real consumers in a controlled environment without affecting the wider system.

Ofgem has pioneered the use of regulatory sandboxes in the energy market, allowing certain companies to run trials of new products or services with some rules temporarily suspended, for a set time and with a limited number of customers with consumer protections in place. Sandbox trials can provide an evidence base to help decision makers understand whether permanent changes to regulation should be made.⁵⁴

Government must give sustained attention to skills and technology development

Technology innovation for low-carbon heating, alongside skills development and supply chain capability, are essential for long-term decarbonisation and must be treated as policy goals in themselves

The decarbonisation pathways set out by the CCC and others emphasise that many low-carbon heating technologies remain too expensive, and that costs must be brought down.⁵⁵ The availability of skilled workers is a key part of the supply chain of any labour-intensive product or service, like installing heating systems in buildings. For both high-quality energy efficiency retrofits and heat pump installation, the UK simply does not have enough skilled and experienced workers. Hydrogen technologies also need to be further developed if the UK is to have the option of hydrogen-based heating.

It is, of course, the private sector, not government, that will deliver the transformation of heating the UK's homes: through installing energy efficiency measures and new heating systems. Consumers are largely content with their existing gas boilers, and companies are unlikely to invest in the skills development and technology investment required to decarbonise heating without a clear policy framework.

Realising the employment benefits of switching to low-carbon heating could help secure public support for net zero

There is a political dimension to this objective too. Previous Institute for Government work has highlighted the importance of maintaining and building public consent for the substantial changes that are required for net zero.⁵⁶ This will be easier where people can see tangible benefits – in terms of jobs and new industries – that arise from a transition to low-carbon heating. We heard that: “It could be the most important political case because it’s genuinely national. You can import a solar panel, but you can’t import someone to make changes to a house.”⁵⁷

There are also delivery risks associated with failing to support the development of the supply chain. Poor-quality installations can damage properties and undermine public trust in energy efficiency measures and low-carbon heating technologies. In Australia, public faith in energy efficiency measures was badly shaken by a rushed policy that drove rapid adoption of poor-quality insulation, and an unregulated market boom that led to the deaths of poorly trained installers.^{58,59} A skilled supply chain, with quality assurance standards and accreditation to underpin it, is essential for maintaining public trust.

Supporting the supply chain has not been prioritised enough

Preparing the market and supply chain for a mass roll-out of renewable heat technologies was given as the second major policy goal of the RHI, but every interviewee we spoke to told us that the focus on rapid deployment, to meet the targets agreed under the renewable energy directive (RED), became paramount.

Against the initial expectations of officials, in its early years the RHI proved far more effective at driving the uptake of biomass boilers than electric heat pumps. Uptake of heat pumps has fallen well short of expectations. The NAO reported in 2018 that just 22% of the initially anticipated installations had happened, well below the lowest range of expected outcomes.⁶⁰ From a long-term decarbonisation perspective, this was a real problem, since developing a heat pump market in the UK is far more important than deploying biomass heating. The emphasis on meeting the RED targets meant that continued biomass deployment was tolerated, and that rather than rethinking the policy completely, BEIS made minor adjustments to stimulate greater uptake of heat pumps.

In short, the emphasis on meeting renewable energy directive goals meant that innovation and supply chain objectives were rarely the focus of sustained attention, and no specific targets or metrics were put in place to assess progress on the goal.⁶¹ Instead, we heard “there was a strong belief that with sufficient investment and signals, a market for installers would spring up by itself”.⁶² More than 10 years after the policy was first envisaged, the capacity of the UK to deliver heat pumps at scale remains weak.

Box 2 The UK’s success in supporting supply chain and technology development with offshore wind will be harder to replicate for heat and buildings

The government has successfully fostered a UK supply chain supporting the development and deployment of offshore wind. The earliest offshore wind projects were based almost entirely on technologies produced overseas. Successive governments supported a sustained effort to build the UK supply chain and drive down costs in the industry. The establishment of a Siemens turbine manufacturing plant in Hull was supported by an enterprise zone, £60m of direct subsidy to port infrastructure refurbishment and £25m from the Regional Growth Fund.⁶³ This was co-ordinated with energy market reforms that provided long-term support for offshore wind, and a clear licensing and permitting process managed by the Crown Estate.

It will be much harder to establish a robust UK supply chain for low-carbon heating. This is partly about market structure: the construction sector, particularly for upgrades to existing houses, is dominated by many thousands of small traders. That makes it difficult for government to engage with, and understand, the needs of the sector.

While the innovation and supply chain challenges for offshore wind were primarily about technological innovation and manufacturing, for energy efficiency there is a much bigger role for skills and training for the many thousands of small traders that will be required. Clear long-term market signals are required for small traders to invest in the training and skills development required to install heat pumps, for example. The result is a bottleneck: too few trained installers inhibit the development of the market, while the small market undermines incentives for installers to invest in training.

Technological and supply chain development requires long-term thinking

Companies will invest in skills and technology development only when they have some confidence that policy will support the development of a market for energy efficiency and low-carbon heating systems in the long term. A good example of a long-term policy that did generate investment and training in this area was the zero carbon homes policy, introduced in 2009, which was due to come into force in 2016. The irony of this example is that the policy was abruptly abandoned in 2015, creating lasting distrust in the industry.

In the first phase of MEES, government decided not to set a clear long-term trajectory towards tighter standards over time, despite strong support for such a move expressed by consultation respondents.⁶⁴ This was a missed opportunity to provide a roadmap for increasing standards in the sector that would have encouraged more companies to invest in training and technology – and subsequent revisions to MEES are now addressing this shortcoming.

To be most successful, regulatory frameworks need to develop over time, with a clear stepping up process. In the context of heat decarbonisation, as one senior official told us, “just saying we’re going to phase out gas boilers by 2035 isn’t enough. There are too many governments between now and then [for people to believe the commitment is permanent].”⁶⁵

The RHI was also distorted by a short-term perspective, largely because it was driven by the EU RED targets for 2020. Many interviewees we spoke to were highly critical of the impact of the RED. For the RED target, it made sense to install biomass boilers: they are attractive to households, particularly those off the gas grid, because they are cheaper and easier to install, and are more easily compatible with existing internal pipework and radiators. However, biomass boilers are much less important for long-term decarbonisation than heat pumps, principally because of limited supplies of sustainable biomass. The RED target meant that deployment of renewable heat – wherever it came from – became more important than the long-term objective of heat decarbonisation. As one policy maker put it, “the RED was one of the worst policies for decarbonisation over the last decade because it totally distorted choices... it led to the emphasis on bioenergy.”

Heat decarbonisation policy needs to incorporate elements of industrial strategy

When BEIS was formed in 2016 – through a merger of the Department of Energy and Climate Change and the Department for Business, Innovation and Skills – many commentators hoped that energy innovation and industrial transformation would benefit from being in the same government department. However, the links between industrial strategy policy and heat decarbonisation policy – and the teams responsible for each – are not as strong as they could be. In a recent submission to parliament, the energy utility company E.On described the lack of emphasis on heating in the government’s industrial strategy as a “glaring omission” and argued in favour of a heat “sector deal”.⁶⁶

We heard some evidence that officials working in industrial strategy and in heat decarbonisation have struggled to bring their work closer together. Despite broadly aligned objectives – growth and innovation in a sector that will generate jobs and deliver low-carbon heat – the teams within BEIS have struggled to collaborate effectively:

“Industrial strategy [teams] wanted to make sure that all policies could talk coherently about the employment impact of policies, and spreading them across the country. But [the] clean heat [directorate] didn’t have the resource to think about remaking the economy. They are concerned with carbon reductions and struggle to get the other kind of evidence together.”⁶⁷

Building the capacity of UK industry to deliver long-term decarbonisation goals needs to be seen as a strategic objective of heat and buildings policies. Clear objectives should be set to measure supply chain development and named officials should be given responsibility for overseeing this.

Co-ordination, consistency and strategic alignment are essential to decarbonisation

Disjointed policies and misaligned ministerial objectives have produced perverse incentives and held back progress

Getting different government departments – or even different directorates within the same department – to co-ordinate on a shared problem is a perennial challenge of government. Decarbonising heat requires action from BEIS and MHCLG, and, of course, co-ordination with the Treasury.

The Institute for Government has argued that BEIS lacks the clout to ensure other departments prioritise net zero, and has argued for a new Cabinet Office unit and named minister co-ordinating sector plans and holding departments to account for delivery.⁶⁸ The centre of government has a key strategic role in setting targets, monitoring delivery and establishing cross-sectoral priorities. But even with greater central attention and oversight, departments will still need to drive specific policies related to the UK’s decarbonisation plan.

Domestic heat has all the hallmarks of a policy area that has suffered over the years from a lack of consistent strategic thinking. Most of the responsibilities and policy levers for delivering decarbonised heat are held by BEIS, but crucial elements of the policy mix like building regulations, EPCs, housing policy and relationships with local government are part of MHCLG’s remit.

The heat policy mix has been confused and contradictory

Designed well and led strategically, different policies across government in the same sector should contribute to shared goals. In the early years of the RHI’s operation, heat and energy efficiency policies were, in effect, not considered as part of one overriding objective (to reduce the carbon emissions produced by heating the UK’s building stock, while keeping down the cost of bills).

Because the RHI was driven overwhelmingly by the need to meet the renewable energy directive, maximising the deployment of renewable heat took precedence over the kind of 'whole-house' solutions for which many in the sector now advocate. Because RHI payments are awarded on the basis of estimated ('deemed') heat demand, the policy incentivises installing renewable technology in inefficient buildings, rather than first installing building fabric measures like insulation.

Policy arrangements also distort competition between differing heat options. Electricity prices include levies to cover the costs of subsidy schemes for renewable electricity and home insulation. Gas prices do not have equivalent levies, with the result that electricity prices are inflated by policy, reducing the competitiveness of heat pumps, which run on electricity.

Policy inconsistencies have also hampered the progress of the MEES regulations. Within months of them being finalised, the government withdrew funding for the Green Deal, and the company managing the scheme closed to new applications. This decision left the MEES regulations without any plausible mechanism to make them work (other than for those eligible to receive support from energy suppliers through the Energy Company Obligation, a scheme designed to help those in fuel poverty). Another mechanism to support landlords to meet obligations under MEES at no net cost – a tax exemption known as the Landlord's Energy Saving Allowance – was also withdrawn in 2015. The government eventually redesigned MEES to remove the 'no cost to landlords' rule, but the case illustrates weak co-ordination of policies during the initial design stage.

EPC ratings are another area of insufficient co-ordination between heat and efficiency. It is widely agreed that many, if not most, homes in the UK will need to have more efficient building fabric, and move on to decarbonised heating, in many cases with a heat pump.* However, it is not uncommon for consumers to receive worse EPC ratings after they have installed a heat pump, largely because the EPC was designed primarily to estimate the cost of heating a home, not its carbon emissions or efficiency per se, and partly because the standardised calculation used to generate EPC ratings still uses 2012 prices to produce cost estimates.⁶⁹ Heat pump experts told us that the calculation methodology for EPCs (known as SAP) effectively assumes that heat pumps will be installed with the wrong controls, and that this further inflates the expected cost.

MHCLG is responsible for the governance of EPC ratings, but BEIS policies make the greatest use of them.⁷⁰ Therefore while problems with EPCs are widely acknowledged and a source of frustration in BEIS – the quality and consistency of assessments is often poor, the process takes no account of quality of the installation of measures, and the relationship between EPC ratings and the actual energy performance of buildings is often tenuous⁷¹ – the people with an incentive to change the system have not had the tools to do so.

* Modelling studies for the decarbonisation of heating presented in the Climate Change Committee's *Sixth Carbon Budget* suggest that, even in scenarios with high adoption of hydrogen for heating, a least-cost heating system for the UK would see heat pumps deployed in around 10 million homes, with many used in hybrid mode alongside a hydrogen boiler.

EPCs are only going to increase in importance in the years ahead. As minimum energy efficiency regulations tighten and spread to other tenures – namely owner-occupied – EPCs will likely acquire a serious financial value. For them to be regarded as legitimate financial instruments, EPCs will need to have the trust of the sector and be seen to be robust and reproducible. A recent government consultation found that only 3% of respondents rated the certificates’ reliability as “good”.⁷² There are positive signs that co-operation between departments is working more effectively on this issue than it has in the past: BEIS and MHCLG published an EPC action plan in September 2020 acknowledging many of the issues, and they are now working to address the mismatch between modelled and real building performance.⁷³

Conflicting objectives between BEIS and the Treasury have also been problematic. The design of the RHI as a tariff, rather than an up-front grant, was partly driven by Treasury concern about near-term public spending. The result was a policy design that underdelivered and was poor value for money. History has repeated itself with the design of the Green Homes Grant, in which different objectives of the Treasury and BEIS resulted in a policy that delivered much less than anticipated and was cancelled at short notice.

Both BEIS and MHCLG have taken some steps to improve strategic thinking, but major barriers remain to a closer interdepartmental working relationship

In BEIS a new strategy team has been established in the buildings directorate to take a “systems approach” to new policy design, to try to ensure co-ordination across the heat, electricity and efficiency teams, and to co-ordinate meta-evaluations that will monitor the impact of the whole suite of policies on decarbonising buildings.⁷⁴

MHCLG has set up a new team focused on the energy performance of buildings, intended to “plug the strategic gap” between otherwise isolated teams working on climate change, planning and the existing housing stock.

A new director-general has also been hired to cover net zero and building safety in the wake of the Grenfell disaster, but there is no dedicated directorate covering the decarbonisation of the housing stock, so cross-cutting proposals with BEIS have to be co-ordinated by a central strategy team covering the entirety of MHCLG’s brief.⁷⁵ Given the extreme political and policy significance of building safety in the current political climate, it is questionable whether responsibility for net zero should have been included in the same senior role.

One senior civil servant in BEIS put it bluntly: “The relationship with MHCLG just isn’t there.”⁷⁶ More working groups and inter-departmental meetings have developed in the past year, we were told, but they have not been effective in “really driving a convergence of objectives and approach”.⁷⁷ Figures in MHCLG told us that it was difficult for them to communicate to BEIS officials, except at the very highest level, the policy trade-offs that they feel they have to deal with.

All departments work to their ministerial team's priorities, and at MHCLG "the order of policy priorities goes safety, supply, and then climate and resilience".⁷⁸ As long as maximising housing supply is seen to be at odds with promoting energy efficiency, BEIS and MHCLG will struggle to work together as effectively as they need to. As one BEIS official put it: "Their objective is to build houses. Our objective is to build efficient houses. Those two things are not the same... reconciling that is a continuous challenge."⁷⁹ Since the adoption of the net zero target, MHCLG has clearly made some moves towards increasing the prioritisation of energy – but it's not yet clear how deep-rooted these changes are, and whether they will buckle when confronted with other housing policy priorities. As long as the minister or ministers responsible for housing view decarbonisation measures as barriers to their *real* aims, progress will be limited. If the prime minister is serious about the net zero target, he must ensure that MHCLG accepts greater accountability for delivering emissions reductions in housing.

The impasse needs to be resolved politically by the prime minister giving direction from the centre

Officials and ministers in MHCLG are understandably reticent about doing anything that risks either reducing the number of new homes being built, or pushing private landlords out of the sector. But, lobbying from the developer industry aside, many of the supposed harmful effects of more stringent regulations have never been tested – the zero carbon homes scheme, the last attempt to seriously reduce the carbon emissions of new build homes, was scrapped at short notice in 2015.

Experts and officials we spoke to questioned whether the trade-off between housing supply and energy efficiency would actually emerge. The widely trailed Future Homes Standard – which the government says will require new homes to be "future-proofed" with low-carbon heating and "world-leading" energy efficiency⁸⁰ – is now close to being introduced, and any negative impacts on the cost or rates of development will be closely monitored.

The Johnson government has made progressing towards the net zero target a key plank of its policy and legislative agenda. Most civil servants we spoke to told us that new structures in the Cabinet Office like the Cabinet Committee on Climate Change were starting to focus minds across government.

But ministers have seemed reluctant to take some of the politically more difficult decisions and an economy-wide net zero strategy has not yet emerged. The Institute for Government has recommended that responsibility for the strategic elements of net zero be moved to the Cabinet Office, to be housed in a sizeable net zero unit drawn from all the major departments involved in the transition, and with large analytic capacity of its own.⁸¹ In part, this reflects the reality that BEIS, as a mid-ranking if large department, will always find it difficult to push through decisions that other secretaries of state will see as contrary to their policy objectives. Strategic leadership has to come from the centre.

A new unit would not be the only way to do this. A stronger, better resourced Cabinet Office, with a remit to push ahead with net zero, would help a lot. That would not mean ministers and civil servants in the centre of government trying to do everything – they would focus on setting and communicating priorities (like climate change), resolving disputes and monitoring delivery. Ultimately this direction has to come from the prime minister, who, if he is serious about making progress, must give clear directions to resolve policy disputes in a net zero-compliant way.

The government should consider establishing an Office for Zero Carbon Buildings

There are no purely institutional fixes to political problems like conflicting ministerial objectives. But institutional alignment at an official level, particularly at the mid-ranking official level where the bulk of policy design, analysis and implementation actually happens, could also be improved.

We heard repeatedly that day-to-day strategic alignment and communication between officials can be a real problem, particularly between MHCLG and BEIS. The government should take steps to address this, while also confronting the political trade-offs directly. It should consider establishing an Office for Zero Carbon Buildings (OZCaB) modelled on the existing Office for Zero Emissions Vehicles (OZEV, formerly OLEV).

OZEV, set up in 2009, has a ringfenced budget that comes from the Department for Transport's (DfT) expenditure, but is run jointly with BEIS. It reports to a named lead cabinet minister and a minister of state from each department, with every note going up through both departments. It administers a grants programme, supports the roll-out of charging infrastructure, provides innovation support, and represents a single point of contact for stakeholders and industry.

Interviewees told us that OZEV has been effective because it has credibility in the car industry and has managed to keep its issue high on the political agenda while securing ministerial buy-in.⁸² Naturally, we were told that OZEV has not been "a panacea for producing joined-up policy", but most officials and outside observers agreed it had made an impact. When it comes to more joined-up policy on decarbonising the UK's buildings, and its homes in particular, a new institution would not need to be a panacea to be a marked improvement.

Rolling out more efficient heating technologies and improving the efficiency of new and existing stock is clearly a different kind of infrastructural and market shift than promoting electric vehicles, but it is a policy area that could still benefit from the kind of interface and agreed set of objectives and outcomes that OZEV has provided.

OZCaB could provide a clear point of contact for industry, something we heard was lacking from companies we spoke to. It would contribute to more long-term policy and regulatory planning, and take responsibility for measures – like the EPC and SAP process – that have suffered from disjointed ownership.

The reaction of officials we spoke to about the idea of a new Office for Zero Carbon Buildings ranged from very supportive to more lukewarm. One senior official in BEIS told us that OZCaB

“... would be an excellent addition to the institutional landscape. It’s the sort of thing you can see genuinely adding value, because not only could you bring in MHCLG, you could bring in the Department of Health [and Social Care] as well, because of the health benefits associated with heating buildings properly. It’s one of those areas where I think join up is absolutely missing.”⁸³

Those sceptical of the idea tended to point to the primacy of the political trade-offs involved in the issue, arguing that if the new body was somehow “divorced from the politics, it could be a massive bureaucratic exercise in lots of responsibility without any power to make decisions”.⁸⁴ Our view is that a new OZCaB would help join up government thinking, but that it makes sense only in the context of a clear direction from the prime minister about the importance of low-carbon housing, alongside Cabinet Office oversight of net zero progress.

Policy teams need resources to ensure effective management of subsidy regimes and to design regulatory interventions

To achieve the pace and level of change required to decarbonise the UK’s housing stock, the government needs to ensure civil service resources follow public statements of political ambition

Some of the recommendations we make above require government departments to think differently and reorganise themselves to collaborate more effectively across different policy teams. Others – such as additional piloting, data gathering and working harder to understand the needs of delivery partners – require additional resources for policy teams working on heat and buildings.

In both the case of the RHI and MEES, some of the weaknesses we have observed are in part a result of insufficient resources in the policy teams developing them. Before the merging of DECC and BIS, policy teams working on heating and energy efficiency issues were widely seen as having too few staff for the task at hand. Senior departmental leaders from the early days of DECC told us that the same small team was in charge of the solar FiT programme and the RHI – a novel and expensive incentive mechanism untried anywhere else in the world. This meant that effectively “[DECC] was the second smallest department, instituting Whitehall’s second biggest delivery programme”.⁸⁵ More generally, we heard repeatedly about evidence not gathered because of resource constraints.

Increased staffing in BEIS, and the successful launch of greater strategic oversight (reducing the scope for intra-departmental resource battles), seems to have changed the picture substantially. Even so, it is not clear that the department has dedicated resources (in people and budget) to match the scale of the problem. An appropriate benchmark for resources might be similarly ambitious past policy initiatives, such as the successful electricity market reform process around 2014.

MHCLG has further to go. Civil servants we spoke to described resourcing as “the biggest issue in the department”, and the reason they sometimes had to defer to BEIS on policy work that should technically fall under their remit.⁸⁶ For areas like EPCs, which are a critical but currently flawed component of the government’s strategy for driving up efficiency in buildings, this lack of resource is a serious problem. We also heard repeatedly from interviewees outside of government that they found MHCLG much harder to engage than BEIS, in part because MHCLG has far fewer people working on buildings decarbonisation.

Ultimately, department resourcing tends to follow ministerial priorities – another reason that leadership from the centre to align ministerial ambitions in MHCLG with the wider net zero agenda is essential.

Adequate resources for policy teams will help avoid expensive policy failures

Poor policy design can be enormously expensive, either in terms of wasted expenditure, unnecessary costs on businesses and homeowners, or a failure to meet important objectives. Policy interventions for heat and efficiency in domestic buildings are becoming increasingly ambitious as the government responds to the net zero target – and we heard that policy failures “will get more and more expensive and more and more difficult as the size, scale and scope [of heat and buildings policies] get bigger”.⁸⁷

Officials we spoke to expressed frustration that getting the Treasury to allocate enough money for resource spending – the money that goes towards administrative, monitoring, evaluation and delivery costs – was exceptionally difficult. Of course, the Treasury is responsible for balancing the competing needs across government. It is important that departments show that their spending represents value for money. But given the costs of getting policy design wrong, declining to invest in the resource costs of designing and administering regulations well is therefore a false economy.

Conclusion: moving from ambition to effective action

The nature of the net zero target is that it requires action across many sectors at once, starting as soon as possible. 2050 may feel like a long way off, but realistically we will know whether the UK is likely to meet its target by the success of its actions between now and 2035. This means that there are probably three parliaments left to get much of the policy needed to reach net zero in place and working.

There are plenty of encouraging signs. After successful government support, the price of renewable energy continues to fall at a rate fast outpacing many experts' most optimistic predictions.⁸⁸ Rapid progress in the development of electric vehicles and government plans to phase out the internal combustion engine could soon prove transformative in our efforts to tackle transport emissions.

Heating is now emerging as the UK's most difficult outstanding sector to decarbonise. The basic outlines of the solution are clear: more efficient homes, and the electrification of most heating systems – with the option of hydrogen should it prove too difficult to drive sufficient uptake of heat pumps. But the policies to put it in place have been limited both in their design and in the effectiveness of their delivery. This report has highlighted weaknesses in the UK's policy making approach in two case studies in the past. While it is clear that both BEIS and MHCLG have learnt from these and other experiences, the recent design and delivery of the Green Homes Grant suggests some of the problems we have identified persist.

The recent Green Homes Grant shows that government is still not working effectively on heat and buildings

The Green Homes Grant was announced in July 2020 as part of the government's efforts to stimulate a 'green recovery' following coronavirus lockdowns. It was announced, launched, extended and then prematurely cancelled within nine months.

The £1.5bn scheme initially targeted improving 600,000 homes by the end of March 2021, by offering homeowners vouchers worth up to £10,000 to pay for energy efficiency and clean heat measures.⁸⁹ The target was over-optimistic: the government's statistics at the beginning of March 2021 show that only 5,193 households had been improved, with a further 32,000 having been approved for funding – around 6% of initial expectations. The window for vouchers to be applied for, received and used (that is, after work was completed) was initially extremely short and ran over winter, typically the time when consumers are least interested in major works affecting their heating system.

After the scheme was launched in September 2020, it quickly became clear that an extension beyond March 2021 was necessary, and in November 2020 the government announced the scheme would run “until the end of March 2022 for the £1.5 billion voucher element”.⁹⁰ Subsequently, in February 2021, the government made clear this extension did not, in fact, cover the £1.5bn initially earmarked: only £320m would be available for 2021–22.⁹¹ In late March 2021, the government changed its mind yet again, and announced the scheme would close on the original date, 31 March 2021.

Government spokespeople blamed a lack of consumer interest for the failure to meet initial ambitions. In fact, a complicated process distinguishing ‘primary’ and ‘secondary’ measures, limited access to accredited suppliers, poor administration from an outsourced company and limited communication with installers made vouchers difficult to access – and households that succeeded had a poor experience with the process.⁹²

The scheme appears to have fallen short against several of the recommendations we have made in this paper. Insufficient attention was paid to the delivery environment of the policy, and too much money was committed over too short a time period without the flexibility to learn and adapt on the go. Although the policy attempted to address supply chain issues by creating incentives for installers to get TrustMark accreditation,^{**} and by providing direct funding for skills development,⁹³ the short time frame badly undermined these efforts – as did the government’s repeated indecision over when the scheme would end and how much money would be available. The poor delivery of the policy compounded these effects: we heard about companies that were laying off recently hired staff because of delays in vouchers being issued.⁹⁴

The cancellation of the scheme in March 2021 has further damaged the supply chain. BEIS put in place measures to ensure accreditation and high standards, yet we heard from companies involved that that “this stop-start approach actually rewards only short-cutting cowboys”,⁹⁵ rather than those that invested in high quality training. The early closure of the scheme repeats the pattern of the past: we heard repeatedly that some companies had not invested in new staff in response to the Green Homes Grant because they were “once bitten twice shy” after policy reversals around the Green Deal, unexpected cuts to solar feed-in tariffs and the abrupt cancellation of the zero carbon homes policy in 2015. The government’s credibility with businesses involved in the industry, which was already low, has been further damaged by the Green Homes Grant, with real implications for the effectiveness of government policy. One company told us:

“We were quite wary because of previous experience. We didn’t take anyone on, but had we had faith in the scheme we would have done... [The cancellation of the policy] reinforces the view among installers that it’s not worth getting involved in government schemes.”⁹⁶

* The Green Homes Grant includes a separate local authority scheme, in addition to the voucher scheme for households

** TrustMark is the government’s quality assurance scheme for relevant tradespeople.

The policy's cancellation seems particularly unfortunate given that the data shows that, by March 2021, the scheme was starting to make a real impact – despite the yawning gap between initial ambition and delivered outcomes. The allocated vouchers, by the end of February 2021, amounted to £125m, with an estimated further £460m of live applications being processed (though not all of those will be approved) – and more than 80,000 households have applied to the scheme.⁹⁷ Government data suggests a potential fourfold increase in the rate of houses getting solid wall insulation compared with baseline rates of insulation under existing government schemes. There has been a substantial increase in accredited companies.⁹⁸

At root, the scheme's troubles appear to lie in the conflicting objectives of BEIS and the Treasury, and a failure to align those objectives in the design of the policy – again highlighting the importance of policy co-ordination across departments. For the Treasury, the Green Homes Grant offered an apparently 'shovel ready' form of stimulus spending that would provide a short-term boost to the economy in the aftermath of lockdowns. For BEIS, the grant was an opportunity to use a rare moment of Treasury largesse to achieve energy policy goals: deployment of energy efficiency measures, while boosting the incentives for construction companies to invest in accreditation and skills through TrustMark. Neither department got quite what they wanted, and the resulting policy – described as "botched" by the Environmental Audit Committee⁹⁹ – was terminated just as it had started to make an impact.

The Green Homes Grant was developed on an exceptionally compressed timescale, as part of the government's initial economic response to the impact of coronavirus, and on that basis the flaws in its design should perhaps not be judged too harshly. But it remains troubling that the policy has suffered from the same weaknesses that we have identified in previous heat and building policies. The government needs to improve how it designs and delivers policies in this area.

The forthcoming Heat and Buildings Strategy must provide a clearer long-term roadmap for policy, and must avoid the mistakes of the past

This report has surveyed several previous policy efforts, particularly focusing on the RHI and MEES regulations, and made recommendations for improving future domestic heat and energy efficiency policies. For too long, there has been little progress on energy efficiency and low-carbon heating.

The government's repeatedly delayed Heat and Buildings Strategy must provide a clearer strategic picture, and in delivering that strategy government must avoid repeating the mistakes of the past that we have identified in this report. There are encouraging signs: the civil servants we spoke to are already taking steps to address some of the issues highlighted in this report, with a stronger focus on delivery and piloting, for example. Alongside the past weaknesses the report has highlighted, we found enthusiasm to improve performance and a commitment to learn from what had gone wrong in the past. The Heat and Buildings Strategy will be a test of that commitment. It will show whether the government is taking seriously both its specific goals on clean heating and its wider climate objectives.

Decarbonising the UK's domestic heating will be accomplished only with effective policy sustained over decades. If the task is approached in fits and starts, without consistency that supports a proper market for home retrofits and low-carbon heat technology, it will fail. The recommendations outlined above offer some guidelines for effective policy making in this sector. They are no guarantee of success, but they would guard against some of the problems that have troubled heat decarbonisation and energy efficiency programmes in the past. With a price tag of £200bn,¹⁰⁰ government cannot afford to get it wrong.

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