



House of Commons  
Committee of Public Accounts

---

# Renewable Heat Incentive in Great Britain

---

**Fortieth Report of Session 2017–19**

*Report, together with formal minutes relating  
to the report*

*Ordered by the House of Commons  
to be printed 14 May 2018*

## The Committee of Public Accounts

The Committee of Public Accounts is appointed by the House of Commons to examine “the accounts showing the appropriation of the sums granted by Parliament to meet the public expenditure, and of such other accounts laid before Parliament as the committee may think fit” (Standing Order No. 148).

### Current membership

[Meg Hillier MP](#) (*Labour (Co-op), Hackney South and Shoreditch*) (Chair)

[Bim Afolami MP](#) (*Conservative, Hitchin and Harpenden*)

[Sir Geoffrey Clifton-Brown MP](#) (*Conservative, The Cotswolds*)

[Martyn Day MP](#) (*Scottish National Party, Linlithgow and East Falkirk*)

[Chris Evans MP](#) (*Labour (Co-op), Islwyn*)

[Caroline Flint MP](#) (*Labour, Don Valley*)

[Luke Graham MP](#) (*Conservative, Ochil and South Perthshire*)

[Robert Jenrick MP](#) (*Conservative, Newark*)

[Gillian Keegan MP](#) (*Conservative, Chichester*)

[Shabana Mahmood MP](#) (*Labour, Birmingham, Ladywood*)

[Layla Moran MP](#) (*Liberal Democrat, Oxford West and Abingdon*)

[Stephen Morgan MP](#) (*Labour, Portsmouth South*)

[Anne Marie Morris MP](#) (*Conservative, Newton Abbot*)

[Bridget Phillipson MP](#) (*Labour, Houghton and Sunderland South*)

[Lee Rowley MP](#) (*Conservative, North East Derbyshire*)

[Gareth Snell MP](#) (*Labour (Co-op), Stoke-on-Trent Central*)

### Powers

Powers of the Committee of Public Accounts are set out in House of Commons Standing Orders, principally in SO No. 148. These are available on the Internet via [www.parliament.uk](http://www.parliament.uk).

### Publication

Committee reports are published on the [Committee's website](#) and in print by Order of the House.

Evidence relating to this report is published on the [inquiry publications page](#) of the Committee's website.

### Committee staff

The current staff of the Committee are Richard Cooke (Clerk), Dominic Stockbridge (Second Clerk), Hannah Wentworth (Chair Support), Ruby Radley (Senior Committee Assistant), Carolyn Bowes and Kutumya Kibedi (Committee Assistants), and Tim Bowden (Media Officer).

### Contacts

All correspondence should be addressed to the Clerk of the Committee of Public Accounts, House of Commons, London SW1A 0AA. The telephone number for general enquiries is 020 7219 6593; the Committee's email address is [pubaccom@parliament.uk](mailto:pubaccom@parliament.uk).

# Contents

---

<b>Summary</b>	<b>3</b>
<b>Introduction</b>	<b>4</b>
<b>Conclusions and recommendations</b>	<b>5</b>
<b>1 Introducing the Renewable Heat Incentive</b>	<b>9</b>
Expectations for the Renewable Heat Incentive	9
Barriers to uptake	10
Impact of UK obligations	11
<b>2 Monitoring the scheme's progress</b>	<b>13</b>
Developing Great Britain's supply-chain of renewable and low-carbon heat	13
Improving air quality	14
Reducing fraud, non-compliance and gaming	15
The cost-effectiveness of the scheme	16
Future strategy for decarbonising heat	17
<b>Formal minutes</b>	<b>18</b>
<b>Witnesses</b>	<b>19</b>
<b>Published written evidence</b>	<b>19</b>
<b>Published correspondence</b>	<b>19</b>
<b>List of Reports from the Committee during the current session</b>	<b>20</b>



## Summary

The Renewable Heat Incentive (RHI) was set up in 2011 to boost rates of renewable and low-carbon heating in Great Britain but it has failed to meet its objectives or provide value for money for the £23 billion expected total cost to taxpayers. As we found with the Green Deal, the Department's forecasts of take-up were wildly over-optimistic. Over nearly 4 years, only 60,000 renewable appliances were installed under the Domestic RHI, compared to 6.2million gas boilers. Gas boilers are usually replaced when they break down or when consumers extend or remodel their house. The Department for Business, Energy and Industrial Strategy (the Department) does not appear to have considered the reasons for consumer heat choices or developed an inclusive and flexible heat strategy. An effective heat strategy needs to join up policy across heat networks; energy efficiency; heat decarbonisation research and development; product quality and building regulations. It may be that for many homes and families heat pumps or biomass boilers are not the answer and other alternatives should be considered by the Department. The RHI simply does not work for households and businesses unable to pay the high upfront costs of renewable and low-carbon heating equipment—particularly as gas and oil boilers are cheaper and remain popular heating choices across the country.

As a result, the Department has had to cut back its expectations of how much renewable heat will be produced by the scheme by almost two-thirds, and of the reductions in carbon emissions due to the scheme by almost half. This means other policies are having to work harder to enable the government to meet its legal obligations.

Poor air quality is a significant threat to the health of the nation, and some RHI-funded installations contribute to air pollution. Yet the Department still does not have a robust system in place to monitor this impact. Current rates of non-compliance among scheme participants are too high and despite well-publicised problems with other, similar schemes, the Department has no estimate of the amount of money overpaid to participants who have manipulated the scheme's rules. The Department is now rethinking its future policy framework to support low-carbon heating. In the remaining three years of the current RHI, it must learn as much as possible and ensure it does not repeat the same mistakes in the future.

## Introduction

---

The Department for Business, Energy and Industrial Strategy (the Department) launched the Non-domestic and Domestic Renewable Heat Incentive (RHI) schemes in Great Britain in 2011 and 2014 respectively. Their objectives are to increase the production of renewable heat and reduce carbon emissions in Great Britain, and to develop domestic supply-chains of renewable and low-carbon heat. These objectives are designed to help the UK meet its ambitious targets for producing renewable energy (sourcing 15% of energy demand from renewables by 2020) and reducing carbon emissions (reduce greenhouse gas emissions by at least 80% by 2050 compared to levels in 1990). The independent Committee on Climate Change advise that meeting long-term carbon targets may be impossible without a near complete elimination of carbon emissions produced by heating homes and businesses, the vast majority of which currently use fossil fuels.

The Renewable Heat Incentive is designed to encourage households and businesses to switch from fossil fuel heating systems to renewable and low-carbon alternatives. It provides funding to participants to invest in a range of technologies including biomass boilers, heat pumps and anaerobic digestion plants, which produce biomethane injected into the natural gas grid. The costs of the RHI are met by the UK taxpayer from general taxation, unlike most other schemes to support low carbon sources of energy which are funded through people's energy bills.

The RHI is a demand-led scheme which, although it can be accessed by anyone, is targeted at those households and businesses which are not connected to the gas grid. Of the 26 million homes and 5.6 million businesses in Great Britain, the vast majority are on the gas grid. Around 1.1 million homes and 62,000 business premises are off the gas grid and use oil and liquefied petroleum gas for heating. The RHI is open to new applications until March 2021. Final payments to participants in the current scheme will run to at least 2040–41, by which time the scheme is expected to have cost the taxpayer £23 billion.

## Conclusions and recommendations

1. **As we found with the Green Deal, the Department for Business, Energy and Industrial Strategy's forecasts of take-up of the Renewable Heat Incentive (RHI) were wildly optimistic, but it has not made efforts to understand why.** Since the launch of the RHI, the Department has dramatically scaled back its ambition in the face of slow uptake. The Department originally expected to install 513,000 new heating systems as part of the scheme, but at current rates of uptake is now expected to install 111,000. The amount the Department expected to invest in the scheme has also reduced from £47 billion to £23 billion. As a result, the scheme is now expected to make a significantly smaller contribution to UK obligations to produce renewable heat and reduce carbon emissions, which have also been cut by 65% and 44% respectively. The government will now need other policies to work harder to pick up the shortfall left by the RHI. The Department accepted that its initial forecasts suffered from optimism bias, yet it was unable to explain to us why this was the case, what lessons it has learnt or how these will be applied in the future.

**Recommendation:** *The Department should write to the Committee demonstrating how a future heat strategy will be underpinned by joined up policy making across Government informed by robust consumer market research.*

**Recommendation:** *The Department should write to the Committee by September 2018 to explain what it will do differently in the future across all of its major projects and programmes to address its track-record of optimism bias.*

2. **Take-up of the RHI was woefully low in large part because the Department failed to understand what consumers want and the barriers to participation in the scheme.** The Department's design of the RHI scheme included several significant barriers which diminish its attractiveness to consumers. Households and business are required to pay for renewable and low-carbon heating equipment upfront. These costs are prohibitive and put the scheme out of reach for many, particularly low-income households. Potential applicants have also been put off by uncertainty over the level of financial incentive offered by the Department, particularly for large-scale projects with long lead times. There is also a "hassle factor" associated with installing renewable and low-carbon heating equipment. Consumers are therefore likely to continue favouring natural gas and oil boilers, which remain relatively cheap, easy to install and continue to be extremely popular across the country. The Department told us that it is planning to address some of these barriers by reforming the RHI in 2018. This includes introducing "assignment of rights", a proposal to make the domestic scheme more accessible to people less able to pay the upfront costs. However, this idea has not been tested for domestic heating.

**Recommendation:** *As part of its new framework to support heat policy, the Department should address the issues of affordability for people less able to pay upfront costs, and how best to inform and influence the homeowners being targeted.*

**Recommendation:** *The Department should write to the Committee prior to the launch of assignment of rights, to explain how it has been tested, the lessons learned from any testing, the risks of implementation and how the Department and Ofgem plan to manage those risks.*

3. **The Department has failed to meet its objectives for the Renewable Heat Incentive or to provide value for money for the £23 billion cost to taxpayers.** The third objective of the RHI is to develop Great Britain's supply-chain of renewable and low-carbon heating, which consists of several technology sectors. The Department told us that it has made good progress in two sectors, the biomethane and biomass sectors. It accepted, however, that it has failed to make progress in other areas, particularly the heat pump sector, a technology which the Department considers strategically important for the future. The cost-effectiveness of the RHI and the value for money of some of the installations it has funded is still uncertain. The Department accepted that some of the installations funded by the RHI would have been built regardless of whether the scheme was in place; that rates of fraud and non-compliance are too high; and that the costs of people manipulating the scheme's rules through "gaming" are not known. These additional costs have not been factored into the Department's own estimate of the cost-effectiveness of the scheme. This means the actual cost-effectiveness of the RHI is likely to be significantly worse than is currently estimated by the Department. Significant gains have been made in increasing the energy efficiency of homes, but there has been a considerable drop in the number of all measures installed from Q1 2013, when the Green Deal and ECO schemes were introduced. Comparing the cost-effectiveness of the Domestic RHI and energy efficiency schemes suggests that the latter provide better value for money in reducing carbon emissions.<sup>1</sup> Energy efficiency schemes, however, do not contribute to the government's renewable heat production obligations under the EU Renewable Energy Directive 2009. The Permanent Secretary did agree that "energy efficiency is very much part of the overall solution". The department's "A Future Framework for Heat in Buildings" consultation suggests some consideration has been given to closer coupling of energy efficiency and heat policies.

**Recommendation:** *The Department should ensure energy efficiency policy is integral to future plans for heat in buildings and show how they will work alongside each other and be cost effective. The Department should write to the Committee by the end of 2018, or as part of its published response to its call for evidence on a Future Framework for Heat in Buildings (whichever is earlier), explaining what lessons it has learned from the RHI, how it is applying those lessons in its future plans for heat in buildings and how it will ensure there is a smooth transition from the current RHI to the successor policy.*

4. **Despite the scheme having a clear objective to develop Great Britain's supply-chain for renewable and low-carbon heat, the Department has no specific goals, measures or milestones to assess progress.** Without these, the Department lacks an objective assessment of whether progress against an objective is on or off track, or the means to prompt remedial action when necessary. The Department told us that it uses data from Ofgem, commercial experts and an industry advisory group to monitor the pattern of applications and how that changes over time. However, the

1 Report by the Comptroller and Auditor General, [Low-carbon heating of homes and businesses and the Renewable Heat Incentive](#), Session 2017–19, HC 779, footnote 15

Department accepted that it does not have specific goals, measures or milestones for its supply-chain objective. We welcome the Department's commitment to clearly define these for future heating policy as well as its commitment to extend this to a parallel project on heat networks, systems which take hot water, heated from a central source and deliver it to homes and businesses which are connected via a network of insulated pipes.

**Recommendation:** *The Department should, by the end of 2018, or as part of its published response to its call for evidence on a Future Framework for Heat in Buildings (whichever is earlier), set and publish clear and specific goals, measures and milestones for developing the low-carbon heating supply-chain within the RHI, any successor policies and its parallel project on heat networks.*

5. **The Department and Ofgem do not understand the impact on air quality of installations funded by the RHI.** Air pollution from sites funded by the RHI is a serious public health issue. Over 28,000 biomass boilers have been funded by the RHI with total payments of £861 million to August 2017. These installations burn wood and produce smoke which can be damaging to air quality. Ofgem told us that they require biomass boilers which have been funded as part of the RHI to have an emissions certificate. However, Ofgem undertakes no monitoring of actual emissions from boilers in use, even when non-compliance is suspected or detected. It relies on Local Authorities, who have statutory responsibility for maintaining air quality in their area, to undertake this monitoring on its behalf. But Ofgem is not actively supporting Local Authorities to undertake monitoring work and the Department is unaware of the scale of the problem. We welcome commitments from Ofgem and the Department to start working more closely with Local Authorities and the Environment Agency to manage this problem and contribute to the development of the Department for Environment, Food and Rural Affairs' Clean Air Strategy.

**Recommendation:** *The Department should write to the Committee by September 2018 to explain how it is improving its understanding of the impact on air quality of installations funded by the RHI.*

**Recommendation:** *Ofgem should write to the Committee by September 2018 to explain how it is actively helping Local Authorities and other relevant public bodies tackle air pollution due to RHI installations.*

6. **Rates of non-compliance are too high and the Department has no estimate of the potential cost of participants gaming the RHI.** Ofgem uses an audit and inspection programme to monitor rates of non-compliance and to target enforcement activity at participants who do not comply with scheme rules. Ofgem told us the current rate of non-compliance in 2016–17 was 4.4% and 2.5% of spending in the non-domestic and domestic schemes respectively. These rates of overpayments are too high. Ofgem also told us that it does not currently estimate the financial impact of gaming, where participants have manipulated the rules of the RHI for financial gain. We welcome Ofgem's commitment to bring down rates of non-compliance, its commitment to continue its audit and inspection programme over the life of the RHI scheme, and its plans to estimate the costs of participants gaming the RHI. These commitments are important lines of defence in safeguarding taxpayers' money and to ensure the benefits promised by the RHI are delivered over its remaining life into the 2040s.

**Recommendation:** *The Department should publish its estimates of the impact of fraud and non-compliance across the whole RHI population in 2017–18 no later than by the end of 2018, and continue to do so annually over the remaining life of the RHI.*

**Recommendation:** *The Department and Ofgem should write to the Committee by September 2018 to explain how they plan to measure the impact of gaming, and how this will enhance the effectiveness of compliance activity.*

# 1 Introducing the Renewable Heat Incentive

---

1. On the basis of a report by the Comptroller and Auditor General,<sup>2</sup> we took evidence from the Department for Business, Energy and Industrial Strategy (the Department) and the Office of Gas and Electricity Markets (Ofgem) on the Renewable Heat Incentive (RHI) scheme in Great Britain.

2. The Department launched the non-domestic and domestic RHI schemes in 2011 and 2014 respectively. The schemes' objectives are to increase the amount of heat produced from renewable sources, reduce carbon emissions from the heating of homes and business premises, and help develop Great Britain's supply-chain of renewable and low-carbon heat. To achieve these aims, the Department initially planned to spend £47 billion between 2011 and 2041, providing payments linked to the amount of heat produced spread over 20 years and 7 years for the non-domestic and domestic schemes respectively. This was expected to fund enough new installations to generate 61 TWh of renewable heat each year by 2020, equivalent to approximately 10% of total demand for heat in the UK. These installations were also expected to reduce the UK's carbon emissions by 246 MtCO<sub>2e</sub> over the lifetime of the scheme, or on average, 11 MtCO<sub>2e</sub> a year, the equivalent of 2% of total UK greenhouse gas emissions in 2016. These outcomes were designed to contribute towards the UK's obligations for renewable energy production (the EU Renewable Energy Directive requires the UK to source 15% of all energy from renewable sources by 2020) and the reduction of carbon emissions (the Climate Change Act 2008 requires the UK to cut its carbon emissions by at least 80% by 2050 compared to levels in 1990).<sup>3</sup>

3. The Department is responsible for the design, performance and overall value for money of the RHI in Great Britain. Ofgem, a non-ministerial government department, is funded directly by the Department to administer the RHI on its behalf. Ofgem is responsible for approving applications, making payments to participants of the scheme and ensuring that heating systems funded by the RHI comply with the scheme's requirements.<sup>4</sup>

## Expectations for the Renewable Heat Incentive

4. The Department originally expected the RHI to fund 513,000 installations by 2020 at a cost of £47 billion over the lifetime of the scheme. By the end of December 2017, more than six years after the start of the non-domestic scheme and more than three years after the start of the domestic scheme, the RHI had funded just 78,048 installations. At current rates of uptake, the scheme will fund 111,000 new installations by 2020–21, 78% less than the number initially intended. The Department expects the cost of the scheme to fall from £47 billion to £23 billion, 51% less than initially planned.<sup>5</sup> The expected total renewable heat production resulting from the scheme has also been reduced by 65%, from 61 TWh to 21 TWh per year by 2020; and total carbon emissions reductions over the life of the RHI have been reduced by 44%, from 246 MtCO<sub>2e</sub> to 137 MtCO<sub>2e</sub>.<sup>6</sup>

---

2 C&AG's Report, [Low-carbon heating of homes and businesses and the Renewable Heat Incentive](#), Session 2017–19, HC 779, 23 February 2018

3 [C&AG's Report](#), paras 1,3, 4, 1.2 & 1.6 and Figure 7

4 [C&AG's Report](#), para 6

5 Q 60, [C&AG's Report](#), para 1.17, Figure 7

6 Q 58, [C&AG's Report](#), Figure 7

5. We examined the Green Deal, a previous scheme which enabled households to take out loans to pay for energy efficiency measures such as wall insulation, in 2016 as part of our inquiry into household energy efficiency schemes. In our report, we concluded that the Department’s initial forecast of demand for Green Deal loans was so wildly optimistic that it gave a misleading picture of the scheme’s prospects to Parliament and other stakeholders. We found that the Department for Energy and Climate Change (now part of the Department for Business, Energy and Industrial Strategy) had implemented the Green Deal in 2013 without adequately testing the design of the scheme with consumers. Take up of the Green Deal was abysmal as a result, with only 14,000 households taking part. The Department’s forecast that the Green Deal Finance Company would provide loans worth more than £1.1 billion by the end of 2015 was wildly optimistic and the actual figure was £50 million, a mere 5% of the original forecast. We therefore recommended that the Department should ensure that all forecasts in future were based on the most accurate and best available evidence, and should be clear about the level of uncertainty involved.<sup>7</sup>

6. We asked the Department why its initial forecasts for RHI were so wildly over-optimistic, particularly given the lessons from previous schemes. It accepted its forecasts for the RHI suffered from optimism bias but it was unable to tell us why, what lessons it has learnt or how these will be applied in the future.<sup>8</sup> However, the Department did explain that the RHI is a novel scheme with no pre-existing guide to refer to. It told us that it had been very ambitious when it started the scheme as the UK had little renewable heat and had a lot of catching up to do compared with other EU countries. The department told us that it took corrective action to revise down its forecasts and change its overall heat strategy, narrowing the targeting of the RHI to those households and businesses which are off the gas grid. It also highlighted several barriers to progress for which it could have done more to fully understand.<sup>9</sup>

## Barriers to uptake

7. Upfront cost is a significant barrier to participating in the RHI scheme.<sup>10</sup> To join the RHI and receive payments, applicants must first finance the purchase and installation of a new eligible heating system. However, this can be more expensive than non-renewable alternatives such as gas boilers. New heating systems can also require additional work, such as new radiators, insulation or storage for fuel, which incur additional costs and contribute to a “hassle factor”.<sup>11</sup> We heard from Citizens Advice, who told us that these upfront costs are one of the biggest barriers to consumers joining the RHI, particularly for low-income households.<sup>12</sup> The Heating and Hotwater Industry Council told us that just 35,000 new appliances had been installed as part of the domestic RHI scheme since the launch of the domestic scheme in 2014. Cheaper gas boilers remain popular, with over 6.2 million installed over the same time period and no indication that this is slowing

7 Qq 23-25, Committee of Public Accounts, [Household energy efficiency measures](#), Session 2016–17, HC 125, 20 July 2016

8 Qq 25-27, 40

9 Qq 28-40

10 Qq 36, 40

11 Qq 36, 38-39

12 Citizens Advice ([RHI0014](#)) para 3.4 & 3.14

down. The Heating and Hotwater Industry Council also told us that households who had installed new appliances are financially secure and live in large properties where the economic case for joining the scheme is most compelling.<sup>13</sup>

8. Uncertainty over the amount of money applicants will receive when their scheme is approved can be another barrier to participation in the RHI. The Association for Decentralised Energy told us that the uncertainty caused by degression (a budget control measure which lowers tariff rates for new applicants if uptake of the RHI is higher than expected and estimated spending exceeds set thresholds) has meant that long-term, large-scale projects are less likely to engage with the RHI.<sup>14</sup> Biomass Partners UK Limited similarly told us that even medium sized projects will take more than six months to plan, commission and install. During this time there is a risk that tariff rates may have fallen, making it almost impossible to raise external finance for projects.<sup>15</sup> The Department recognised these concerns, and told us that proposals to guarantee tariff rates for large-scale projects on the non-domestic scheme are being presented to Parliament to try to address this barrier to participation.<sup>16</sup>

9. The Department accepted that it did not carry out enough consumer research into the upfront costs of the scheme and the impact it would have on take up of the RHI before it launched the schemes in 2011 and 2014.<sup>17</sup> It told us that it now plans to address some of these barriers in 2018, including by introducing “assignment of rights”. This will allow a third party to pay for a participant’s renewable heating system in return for their RHI tariff payments and is designed to address the barrier of upfront costs. Assignment of rights has not previously been tried on the RHI. The Department told us that it is working with the Financial Conduct Authority and has taken evidence in a public consultation to ensure the assignment of rights adequately protects consumers.<sup>18</sup> It will be important to get this reform right. Citizens Advice told us that it receives regular complaints from consumers who have signed up for loans (a different financing structure to assignment of rights) to cover the upfront cost of installations. In some cases this has led to those consumers not receiving RHI payments to cover the costs of loans because their application to Ofgem was rejected, or the RHI payments they receive were significantly less than expected.<sup>19</sup>

## Impact of UK obligations

10. The UK has committed to producing 15% of all energy from renewable sources by 2020 as part of the EU’s Renewable Energy Directive, and longer-term targets (in UK legislation) for reducing emissions of carbon dioxide. We were concerned that the low take up of the RHI will have left a gap that other schemes will have to work harder to fill. The Department told us that on the UK’s obligations for renewable heat, some of the gap left by the RHI has been filled by much higher than expected levels of renewable heating from sources not subsidised by the RHI, such as wood-burning stoves, open fires and reversible air-to-air heat pumps. It estimated that these heating sources currently produce 37 TWh per year compared to an original estimate of 10 TWh per year.<sup>20</sup> The Department also

13 Heating and Hotwater Council ([RHI0007](#)) paras 1–2

14 Association for Decentralised Energy ([RHI0021](#)) page 2

15 Biomass Partners UK Limited ([RHI0009](#)) para 2

16 Q 73

17 Qq 39

18 Q 45

19 Citizens Advice ([RHI0014](#)) para 3.5

20 Qq 40, 58; [C&AG’s Report](#), Figure 7 and paragraph 2.8

told us that it has flexibility in how it can achieve its obligations. It asserted that to date it has hit all interim targets and that it is on track to meet its obligations. However, the Department did not explain to us what other policies are now having to work harder, to fully fill the gap left by the RHI.<sup>21</sup>

## 2 Monitoring the scheme's progress

### Developing Great Britain's supply-chain of renewable and low-carbon heat

11. One of the objectives of the Renewable Heat Incentive (RHI) is to develop Great Britain's supply-chain of renewable and low-carbon heat. The Department for Business, Energy and Industrial Strategy (the Department) told us the RHI had contributed to the creation of a thriving biomethane sector. The Department told us that it had spent £328 million on developing the biomethane sector as part of the RHI, which had helped to create a supply-chain and a successful industry where there was none before. The non-domestic RHI scheme has funded 80 new biomethane installations which generate the same amount of heat as 50,000 to 60,000 installations on the domestic scheme.<sup>22</sup> It also told us that installation costs for non-domestic biomass boilers have fallen by 46% between 2010 and 2016, which has made them more attractive to potential participants in the scheme.<sup>23</sup> However, Andigestion Ltd wrote to us highlighting that at current available gate fees (revenue typically accrued by biomethane plant operators upon receipt of food waste), and levels of support under the RHI, no new biomethane plants are being constructed.<sup>24</sup> Although the Department told us that its view of the biomethane market did not match this assessment, it does plan to increase tariff rates in this sector by 70%.<sup>25</sup> Andigestion Ltd told us that new plant developments receiving these higher rates will have a profound impact on existing plants which do not benefit from such subsidy. This is because all plants compete for a fixed, or even declining, total food waste feedstock.<sup>26</sup>

12. The Department accepted that it has had less success with developing the market for heat pumps, a strategically important sector for the future.<sup>27</sup> While the Department accepted that the market for heat pumps was currently flat, the Ground Source Heat Pump Association went further and described the RHI as “shrivelling and unappealing”. The Association told us that the size of the market for ground source heat pumps reduced following the launch of the RHI and has remained, every year since, below the levels recorded in the three years leading up to the launch of the RHI in 2011.<sup>28</sup> To try to address this, in September 2017, the Department increased tariff rates available for heat pumps on the domestic scheme with the aim of boosting take up. It told us it is too early to tell whether this change has worked in stimulating take up in the heat pump sector.<sup>29</sup>

13. The Department told us that it collects a range of information to determine the state of Great Britain's supply-chain of renewable and low-carbon heat, and that it had commercial experts in the team who gather intelligence on the renewable and low-carbon heat market. It told us that it uses data from Ofgem to monitor patterns of new applications and how

22 Qq 27, 65–66, 75

23 Q 66, [C&AG's Report](#), Figure 6 & 12

24 Andigestion Ltd ([RHI0012](#)) page 1

25 Qq 91–92, [The Renewable Heat Incentive Scheme Regulations 2018](#), Schedule 6, Tariffs

26 Andigestion Ltd ([RHI0022](#)) pages 1 & 2

27 Q 67

28 Ground Source Heat Pump Association ([RHI0017](#)) page 2

29 Qq 72–73

that is changing over time, and that it has an industry advisory group that meets regularly. However, the Department accepted that it does not use this information to assess progress against specific goals, trajectories or milestones.<sup>30</sup>

14. Clearly defined objectives are essential for major programmes so that an objective assessment of progress can be made and remedial action triggered when necessary. The Department accepted this and that having this information would allow it to make a better assessment of whether the RHI was on track.<sup>31</sup> We asked the Department what assurances it could provide on how it will ensure greater clarity in the future to enable an objective assessment of progress in developing the supply-chain. The Department confirmed that a new scheme which follows the RHI will have clearly defined objectives for the supply-chain that enable an assessment of whether it is on or off track. The Department also told us that it is looking to use this approach in a parallel scheme on heat networks, systems which generally take hot water, heated from a central source and deliver it to homes and businesses which are connected via a network of insulated pipes.<sup>32</sup>

### Improving air quality

15. The Department estimates that over 1 million homes and businesses currently use oil for heating, with many more using coal.<sup>33</sup> Burning oil and coal for heat produces smoke which can damage air quality. According to the Department's RHI deployment statistics, the domestic RHI has supported over 21,000 homes switch from oil and coal heating to a low-carbon alternative up to February 2018. This includes 13,000 households who decided to install a heat pump or solar thermal system, heating systems which produce no direct emissions which can damage local air quality, and 8,000 households who installed a biomass boiler. Equivalent data on the non-domestic scheme is not available.<sup>34</sup> Biomass boilers are a popular technology within the RHI. Across the non-domestic and domestic schemes, there are over 28,000 biomass boilers accredited to the RHI.<sup>35</sup> Biomass boilers burn wood to produce heat. A by product of this process is smoke which is emitted to the atmosphere and can damage local air quality.

16. RHI regulations set maximum emissions levels for equipment installed as part of the scheme. These limits apply to all participants who joined the scheme from September 2013, and they require a RHI emissions certificate for the biomass boiler installed.<sup>36</sup> RHI emission certificates are typically provided by manufactures. They contain the results of emission testing for each type of biomass boiler, under standard test conditions from an accredited laboratory. Ofgem told us it checks these certificates as part of its site audit and inspection process.<sup>37</sup> However, Ofgem also told us that it does not measure actual emissions from sites funded by the RHI, or the impact on local air quality. It relies on Local Authorities to do this, as they have statutory responsibility for maintaining air quality and handling air quality complaints in their area. Yet Ofgem does not proactively

---

30 Q 74

31 Q 74

32 Qq 76–77

33 Department for Business Energy & Industrial Strategy, [A Future Framework for Heat In Buildings: Call for Evidence](#), 19 March 2018, para 2.1

34 Department for Business Energy & Industrial Strategy, [Renewable Heat Incentive Deployment Data](#), February 2018

35 [C&AG's Report](#), Figure 6

36 [C&AG's Report](#), para 3.18, footnote 26

37 Qq 50, 54

share its data to assist Local Authorities in these activities. Ofgem told us that it will cooperate more effectively with other bodies, particularly Local Authorities, to allow them to maintain air quality.<sup>38</sup>

17. We asked the Department to clarify how biomass boilers fit into the government's wider, long-term plans for clean air. The Department told us it was talking to the Department for Environment, Food and Rural Affairs on the developments of its Clean Air Strategy. It also told us that it has commissioned a study of how biomass boilers operate in reality, rather than relying solely on factory/test environment data and it is reviewing how it can work with the Environment Agency to address the challenge of air quality.<sup>39</sup>

## Reducing fraud, non-compliance and gaming

18. Ofgem is responsible for approving new RHI applications, making payments and ensuring participants' heating systems comply with RHI regulations over the lifetime of the scheme. Ofgem reviews all applications for the RHI and accredits those which pass its initial checks and are ready to join the scheme. It told us it visits around 10% of all sites at the application stage, and nearly 12,000 applications to the RHI have been rejected or withdrawn prior to accreditation because applicants could not meet Ofgem's application criteria.<sup>40</sup> Ofgem told us it has a zero tolerance approach to fraud within the scheme. Once participants are accredited to the scheme, Ofgem starts making quarterly payments and inspects some sites, including over 500 in 2016–17.<sup>41</sup> Through this activity, Ofgem told us it has suspended payments on 3,000 accounts whilst it investigated issues of non-compliance and has removed 600 recipients from the scheme. It told us that in 2016–17 it recovered £360,000 of payments as a result of non-compliance and has made 30 referrals to Action Fraud which has led to one successful prosecution.<sup>42</sup>

19. The Department has set guidelines on tolerable levels of non-compliance within the schemes, which are 1% and 3% of annual spending on the non-domestic and domestic RHI schemes respectively. Current rates of overpayments as a result of non-compliance with the scheme's rules are estimated at 4.4% and 2.5% of total scheme expenditure (on the non-domestic and domestic RHI schemes respectively).<sup>43</sup> Ofgem accepted that this was too high, but asserted that it has sufficient powers and resources to deal with the problem. It aims to bring rates of non-compliance down to tolerable levels within two to three years and continue to enforce the rules until the end of the current scheme in 2041.<sup>44</sup>

20. Gaming is where participants are generating and using heat which is technically compliant with the regulations, and so the Department is required to make payments under the scheme, but is in a way that does not meet the intentions or spirit of the scheme. The Department and Ofgem explained the use of multiple boilers to take advantage of more generous tariff rates and people using heat generated under the RHI to dry wood, waste or other materials, to then feed back into the boiler to burn it again are two examples

38 Q54; [C&AG's Report](#) 3.19

39 Qq 50-53; [Correspondence with the Department for Business, Energy & Industrial Strategy](#), dated 28 March, pages 2 & 3

40 Qq 16, 20

41 Qq 7; [C&AG's Report](#) Figure 16

42 Qq 7, 16, 20

43 Qq 9, 17

44 Qq 16, 18, 21

of gaming for which it is aware and has taken action.<sup>45</sup> Ofgem told us that it manages this problem by sharing intelligence of gaming in a central register, and having a regular dialogue with the Department. Ofgem also told us that it does not estimate the financial impact of gaming but accepted that it should do and plans to do so in the future.<sup>46</sup>

## The cost-effectiveness of the scheme

21. In nearly 4 years 60,000 new renewable appliances were installed under the Domestic RHI alongside 6.2 million gas boilers in the same period.<sup>47</sup> Consumers tend to replace gas boilers at the time they break down or if they are extending or remodelling their homes. The Department appears to have given little thought to the reasons for consumer heat choices and develop a heat strategy that is inclusive and flexible. To achieve this there must be an effective heat strategy which joins up policy making across heat networks, energy efficiency, heat decarbonisation research and development, product quality and building regulations. It maybe that for many homes and families heat pumps or biomass boilers are not the answer and other alternatives should be considered by the department.

22. The cost-effectiveness of the RHI can be measured in different ways, but the most straightforward is to calculate the amount of tax-payer subsidy that is spent to achieve one megawatt hour of renewable heating (£/MWh) and/or reduce carbon emissions by one tonne (£/tCO<sub>2</sub>e). The Department's estimates of cost-effectiveness based on this approach are uncertain, and likely to overstate the actual cost-effectiveness of the RHI. Using the Department's assumptions, the NAO estimated renewable heat cost-effectiveness was £49/MWh, compared to the Department's latest target of £51/MWh.<sup>48</sup> The Department uses a different approach to measure carbon cost-effectiveness.<sup>49</sup> Using this approach, it told us its estimate of carbon cost-effectiveness is £56/tCO<sub>2</sub>e compared to a benchmark of £68/tCO<sub>2</sub>e. However, the Department confirmed the RHI has funded installations which would have been built regardless of whether the scheme was in place or a financial incentive was available.<sup>50</sup> These deadweight costs, alongside overpayments made to participants as a result of fraud, non-compliance and people gaming the rules of the scheme for financial gain, have not been factored into the Department's estimate.<sup>51</sup> This means the actual cost-effectiveness of the RHI is likely to be more expensive than the Department's current estimate. The Department agreed with written evidence submitted by the University of Exeter's Energy Policy Group that the cost-effectiveness of the RHI is skewed by the higher than anticipated take-up of biomass. This makes the scheme appear cheaper than if it had delivered additional progress on heat pumps, a more expensive but strategically important heating technology for the future.<sup>52</sup>

---

45 Qq 21, 93

46 Q 21

47 [C&AG's Report](#); Heating and Hotwater Council ([RHI0007](#))

48 [C&AG's Report](#), Figure 13

49 The Department estimate carbon cost-effectiveness using a method based on the net 'resource cost' to the economy. This compares the cost of installing and running the technology with an estimate of the monetary value (to society) of the carbon saved and renewable heat generated.

50 Qq 64–65, 71

51 [C&AG Report](#), Para 2.22

52 Q 66, University of Exeter Energy Policy Group ([RHI0020](#)) para 1.9

## Future strategy for decarbonising heat

23. The Department is now rethinking its heat strategy. In March 2018, it published a call for evidence on a Future Framework for Heat In Buildings. The consultation is clear that the government intends to close the RHI scheme in its current form to new applicants on the 31 March 2021. It seeks views on what framework should follow on from 2021 through to the 2030s.<sup>53</sup> The Department told us the call for evidence is feeding into a review of its overall strategy for low-carbon heating and what technologies are to be supported in the future. It expects this review to be completed by the end of 2018.<sup>54</sup>

24. It is crucial that valuable, low-carbon heating funded by the RHI and future schemes isn't allowed to escape buildings through poorly insulated roofs, walls and windows. We asked the Department if energy efficiency was likely to be part of its future plans. The Department told us that the cheapest energy is the energy you do not use and it would look at what people say on this as part of its call for evidence.<sup>55</sup> The Department then went on to explain that ministers are yet to decide on what the new strategy and framework will look like. They are however mindful of the need to preserve the benefits of the RHI achieved so far and ensure a smooth transition to the new framework.<sup>56</sup> It expects to complete its review by the end of 2018, with any update on a new scheme provided as part of the 2019 Spending Review.<sup>57</sup>

---

53 Department for Business Energy & Industrial Strategy, [A Future Framework for Heat In Buildings: Call for Evidence](#), Ministerial Foreword and Executive Summary

54 Qq 47–48

55 Qq 68–71

56 Qq 15, 72

57 Q 88

## Formal minutes

---

**Monday 14 May 2018**

Members present:

Meg Hillier, in the Chair

Sir Geoffrey Clifton-Brown	Gillian Keegan
Chris Evans	Anne Marie Morris
Caroline Flint	Lee Rowley

Draft Report (*Renewable Heat Incentives in Great Britain*), proposed by the Chair, brought up and read.

*Ordered*, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 24 read and agreed to.

Introduction agreed to.

Conclusions and recommendations agreed to.

Summary agreed to.

*Resolved*, That the Report be the Fortieth of the Committee to the House.

*Ordered*, That the Chair make the Report to the House.

*Ordered*, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Wednesday 16 May 2018 at 2.00pm]

## Witnesses

---

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

**Wednesday 21 March 2018**

*Question number*

**Alex Chisholm**, Permanent Secretary, **Dan Osgood**, Director for Heat and Business Energy, Department for Business, Energy and Industrial Strategy, **Dermot Nolan**, Chief Executive, Office for Gas and Electricity Markets, and **Chris Poulton**, Managing Director for E-Serve, Ofgem

[Q1-97](#)

## Published written evidence

---

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website. RHI numbers are generated by the evidence processing system and so may not be complete.

- 1 4Gen Solutions UK ([RHI0011](#))
- 2 AMP Plc ([RHI0004](#))
- 3 Andigestion Ltd ([RHI0012](#))
- 4 Andigestion Ltd ([RHI0022](#))
- 5 Arensis ([RHI0001](#))
- 6 Association for Decentralised Energy ([RHI0021](#))
- 7 Bio Global Industries Ltd ([RHI0002](#))
- 8 Biomass Partners UK Limited ([RHI0009](#))
- 9 Citizens Advice ([RHI0014](#))
- 10 Climate Change Economics ([RHI0016](#))
- 11 Dr D.C. Pike ([RHI0023](#))
- 12 Finn Geotherm UK Ltd ([RHI0003](#))
- 13 Green Alliance ([RHI0006](#))
- 14 Ground Source Heat Pump Association ([RHI0017](#))
- 15 Heating and Hotwater Council ([RHI0007](#))
- 16 Iona Capital ([RHI0010](#))
- 17 Mineral Products Association ([RHI0019](#))
- 18 National Farmers' Union ([RHI0015](#))
- 19 NerG Ltd ([RHI0005](#))
- 20 Renewable Energy Association ([RHI0018](#))
- 21 Sustainable Energy Association ([RHI0013](#))
- 22 The Anaerobic Digestion and Bioresources Association ([RHI0008](#))
- 23 University of Exeter Energy Policy Group ([RHI0020](#))

## Published correspondence

---

The following correspondence was also published as part of this inquiry:

- 1 [Correspondence with the Department for Business, Energy and Industrial Strategy, dated 28 March](#)

## List of Reports from the Committee during the current session

---

All publications from the Committee are available on the [publications page](#) of the Committee's website. The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

### Session 2017–19

First Report	Tackling online VAT fraud and error	HC 312 (Cm 9549)
Second Report	Brexit and the future of Customs	HC 401 (Cm 9565)
Third Report	Hinkley Point C	HC 393 (Cm 9565)
Fourth Report	Clinical correspondence handling at NHS Shared Business Services	HC 396 (Cm 9575)
Fifth Report	Managing the costs of clinical negligence in hospital trusts	HC 397 (Cm 9575)
Sixth Report	The growing threat of online fraud	HC 399 (Cm 9575)
Seventh Report	Brexit and the UK border	HC 558 (Cm 9575)
Eighth Report	Mental health in prisons	HC 400 (Cm 9575) (Cm 9596)
Ninth Report	Sheffield to Rotherham tram-trains	HC 453 (Cm 9575)
Tenth Report	High Speed 2 Annual Report and Accounts	HC 454 (Cm 9575)
Eleventh Report	Homeless households	HC 462 (Cm 9575)
Twelfth Report	HMRC's Performance in 2016–17	HC 456 (Cm 9596)
Thirteenth Report	NHS continuing healthcare funding	HC 455 (Cm 9596)
Fourteenth Report	Delivering Carrier Strike	HC 394 (Cm 9596)
Fifteenth Report	Offender-monitoring tags	HC 458 (Cm 9596)
Sixteenth Report	Government borrowing and the Whole of Government Accounts	HC 463 (Cm 9596)
Seventeenth Report	Retaining and developing the teaching workforce	HC 460 (Cm 9596)
Eighteenth Report	Exiting the European Union	HC 467 (Cm 9596)

Nineteenth Report	Excess Votes 2016–17	HC 806 (Cm 9596)
Twentieth Report	Update on the Thameslink Programme	HC 466
Twenty-First Report	The Nuclear Decommissioning Authority’s Magnox	HC 461
Twenty-Second Report	The monitoring, inspection and funding of Learndirect Ltd.	HC 875
Twenty-Third Report	Alternative Higher Education Providers	HC 736
Twenty-Fourth Report	Care Quality Commission: regulating health and social care	HC 468
Twenty-Fifth Report	The sale of the Green Investment Bank	HC 468
Twenty-Sixth Report	Governance and departmental oversight of the Greater Cambridge Greater Peterborough Local Enterprise Partnership	HC 896
Twenty-Seventh Report	Government contracts for Community Rehabilitation Companies	HC 897
Twenty-Eighth Report	Ministry of Defence: Acquisition and support of defence equipment	HC 724
Twenty-Ninth Report	Sustainability and transformation in the NHS	HC 793
Thirtieth Report	Academy schools’ finances	HC 760
Thirty-First Report	The future of the National Lottery	HC 898
Thirty-Second Report	Cyber-attack on the NHS	HC 787
Thirty-Third Report	Research and Development funding across government	HC 668
Thirty-Fourth Report	Exiting the European Union: The Department for Business, Energy and Industrial Strategy	HC 687
Thirty-Fifth Report	Rail franchising in the UK	HC 689
Thirty-Sixth Report	Reducing modern slavery	HC 886
Thirty-Seventh Report	Exiting the European Union: The Department for Environment, Food & Rural Affairs and the Department for International Trade	HC 699
Thirty-Eighth Report	The adult social care workforce in England	HC 690
Thirty-Ninth Report	The Defence Equipment Plan 2017–2027	HC 880
First Special Report	Chair of the Public Accounts Committee’s Second Annual Report	HC 347