

# Annex B1: RHI accredited applicant survey

**Technical method** 

April 2020





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# Background

The Department for Business, Energy and Industrial Strategy has commissioned an evaluation of the reformed RHI, which is being delivered by CAG Consultants, working with Winning Moves, Hatch Regeneris, EREDA and UCL. The evaluation will provide a) an assessment of the impact of the scheme, and b) strategic learning to inform heat policy development. The evaluation is structured around theory-based evaluation methods which will develop, test and refine realist theories about the reformed RHI as the scheme proceeds.

This document provides a technical annex to a report published under the evaluation of the reformed renewable heat incentive (RHI) scheme. The overall evaluation plan for this evaluation has been published alongside previous evaluation reports<sup>1</sup>. This technical annex provides the methodology used to conduct surveys with applicants to the RHI scheme.

The overall evaluation has aims to both assess the impact of the scheme and provide strategic learning to support heat policy development. A key part of achieving these aims is collecting evidence from participants in the scheme and for that reason applicant surveys have taken place since 2014 for both domestic<sup>2</sup> and non-domestic applicants<sup>3</sup>. The evaluation of the reformed RHI scheme builds on these previous surveys and provides continuity of evidence collection.

The applicant surveys described in this annex are necessary because the application process, and further administration of the scheme, do not collect sufficient evidence to address the evaluation questions. This application and administrative data are however used in combination with the survey data to provide a full picture of scheme applicants (for example the application includes details of the technology installed, but the survey is required to provide applicant demographics or motivations for applying).

The data collected through these surveys are reported as stand-alone evidence, but more importantly provide evidence that the other evaluation workstreams use. A full mapping of the evidence sources used to address the evaluation questions has previously been published in a summary evaluation plan<sup>4</sup>.

<sup>&</sup>lt;sup>1</sup> RHI Evaluation Synthesis Report: Appendices (2019)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\_data/file/831621/RHI\_E valuation\_Synthesis\_Report-Appendices.pdf

<sup>&</sup>lt;sup>2</sup> <u>https://www.gov.uk/government/publications/report-from-waves-1-24-of-the-domestic-rhi-census-of-accredited-applicants</u>

<sup>&</sup>lt;sup>3</sup> <u>https://www.gov.uk/government/publications/non-domestic-survey</u>

<sup>&</sup>lt;sup>4</sup> RHI Evaluation Synthesis Report: Appendices (2019)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\_data/file/831621/RHI\_E valuation\_Synthesis\_Report-Appendices.pdf

# Introduction

This document details the methodology used in the RHI accredited applicant surveys<sup>5</sup> (up to March 2020), following four waves of monitoring surveys of RHI domestic and non-domestic applicants (including two retrospective surveys and two waves of the ongoing bi-annual monitoring). These surveys form part of the wider evaluation of the RHI, not detailed in this document (theory development, qualitative interviews with key audiences, quasi-experimental impact assessment, sustainable markets assessment, cost effectiveness assessment, competition and trade assessment).

The document covers:

- The sample for inclusion in the RHI accredited applicant survey waves.
- The rationale for the survey modes adopted.
- The survey design and refinement process.
- How the data is cleaned, weighted and analysed.
- How the analysis is reported to BEIS.

Within each of these broad topics, key differences / changes between waves are noted.

<sup>&</sup>lt;sup>5</sup> Specifically, 'recipient' as the survey has focused upon successful applicants only.

#### Applicant surveys completed to date

To date, four RHI accredited applicant survey waves have been completed. These are outlined in the table below.

Table 1. Table outlining application dates eligible and the dates over which the survey was active for each survey wave by applicant group.

Survey wave	Applicant group (online survey unless stated)	Successful application date range for sample selection	Dates the survey was active
Domestic waves 1-24 These waves pre-date t discussed in detail in th	this evaluation project and are not is document <sup>6</sup> .	9 April 2014 - 30 March 2016	1 June 2014 and 15 July 2016
Non-Domestic waves 1-2 <sup>7</sup> These waves pre-date this evaluation project and are not discussed in detail in this document <sup>8</sup> .		November 2011 – 4 <sup>th</sup> January 2014 and 5 <sup>th</sup> January 2014 – 31 <sup>st</sup> December 2014	3 <sup>rd</sup> March 2014 to 31 <sup>st</sup> March 2014 and 23 <sup>rd</sup> February 2015 and 6 <sup>th</sup> March 2015

<sup>&</sup>lt;sup>6</sup> Full details and methodology at <u>https://www.gov.uk/government/publications/report-from-waves-1-24-of-the-domestic-rhi-census-of-accredited-applicants</u>

<sup>&</sup>lt;sup>7</sup> For consistency within the survey fieldwork discussed in this annex, the non-domestic surveys conducted from 2017 onwards are numbered in line with the domestic survey waves.

<sup>&</sup>lt;sup>8</sup> Full details and methodology <u>https://www.gov.uk/government/publications/non-domestic-survey</u>

Survey wave	Applicant group (online survey unless stated)	Successful application date range for sample selection	Dates the survey was active
25	Domestic	1 <sup>st</sup> April 2016 – 20 <sup>th</sup> September 2017	November 2017 – January 2018
	Non-domestic	1 <sup>st</sup> January 2015 – 20 <sup>th</sup> September 2017	December 2017 – January 2018
	Biogas/biomethane (telephone)		January – February 2018
	Specific domestic and non-domestic sub-samples (telephone)	As above for domestic and non-domestic	
26	Domestic	21 <sup>st</sup> September 2017 – 31 <sup>st</sup> August 2018	October - November 2018
	Non-domestic		
	Biogas/biomethane		
27	Domestic	1 <sup>st</sup> September 2018 – 28 <sup>th</sup> February 2019	April - May 2019
	Non-domestic		
	Biogas / biomethane		

# Sample selection

The RHI accredited applicant survey aims to include in the sample all applicants who have been accredited to the scheme. Aside from successful application status and an eligible date range, there were no other criteria for inclusion of the applicant / application in the monitoring survey. There are a number of fields used to weight the data, as described in the section on 'data preparation', but these do not form part of the selection criteria. Every unique applicant is invited to participate, and the application date range is used to select those that should be approached within each wave of monitoring. Each applicant can have more than one application to the scheme and so where applicants have more than one application the survey relates to is chosen at random<sup>9</sup>.

The RHI accredited applicant survey has covered three main groups: domestic RHI applicants, non-domestic RHI applicants (for all technologies except biogas/biomethane) and non-domestic RHI applicants for biogas/biomethane plants. Biogas / biomethane are different from other technologies covered as they are not generating heat but a fuel which is then used elsewhere. This could be pumped into the gas grid or used for on-site heat/transport. Some plants are set up as a completely independent business. The question areas of interest to BEIS are therefore different to non-domestic applicants generally.

As noted above, consistent with the previous (Waves 1 - 24) RHI accredited applicant survey, waves 25 of the survey onwards only cover successful applicants. For each survey wave, the sample of 'successful' applications equates to approved applications in the timeframe to be covered in that wave. For the non-domestic survey, again for consistency with previous monitoring work, Winning Moves approached only successful applications with an accreditation date in the period under examination for Waves 25-27. This reduced the risk of approaching cases where an application had been made but the Renewable Heating Technology was yet to be installed, as well as the risk of approaching applicants that had already been approached in a previous wave<sup>10</sup>. As of August 2019, there were 2,613 non-accredited applications in the non-domestic applicant database, i.e. 12% of total.

Within waves 25-26 telephone boosts were included to increase response rates in small subgroups, in order to support subgroup analysis. These boosts sit within the overall sampling method whereby all applicants are included in the sample and all members of each sub-group are also included in the sample for each boost.

# Survey mode

The majority of the detailed applicant monitoring has been conducted through an online survey, with a link to the survey being sent to all successful applicants with tariff rate dates, accreditation dates or submission dates in the period of interest, as documented above.

A principal advantage of conducting the survey online is the lower cost per interview when compared to telephone interviewing. It is also advantageous to use an online survey as this is consistent with the approach used in historic monitoring and the questionnaire contains several

<sup>&</sup>lt;sup>9</sup> Survey questions ask questions which are specific to the installation, so it is necessary to ask applicants for multiple installations to think about one in particular when responding to the survey.

<sup>&</sup>lt;sup>10</sup> Unsuccessful applicants are the focus of qualitative workstreams within the wider evaluation project.

#### RHI accredited applicant survey: technical method

lengthy questions and questions featuring a large list of options. A telephone interviewer reading these out – and potentially having to repeat them multiple times – would be inefficient at scale and likely lead to lower quality answers or respondent drop-out due to length and perceived complexity. The online survey also enables the inclusion of applicant information that customises the survey for each applicant. For example, survey questions include reference to precise technology type installed and the accreditation date.

The online survey software also enables respondents to complete the survey in multiple stages at their leisure (it saves their progress through the survey) and so again potentially reduces drop-out from a respondent not having the time to participate in an interview in one sitting and not wanting to conduct multiple telephone conversations. Where questions sought information that respondents may not have known off the top of their head (e.g. costs) the mode also enables respondents to pause the survey, look up a particular piece of data, and resume.

Another key potential drawback of online surveys is low response rates; however, this is less of an issue in contexts such as this where only successful RHI applicants are approached. Successful applicants are more engaged in the process and therefore more likely to complete the survey compared to asking those that were unsuccessful. It is necessary to achieve good response rates as the sample is self-selecting and therefore there is a need to be confident that the completed survey responses are not extreme / outlier views. This is discussed in the 'maximising response rates' section below.

Linked to the non-response issue, online surveying is not conducive to establishing and managing sample quotas, as there can only be limited control over which customers choose to respond. For example, where a sub-sample of a particular characteristic is small to begin with – representation of a particular group of interest could be too small to allow for meaningful analysis. For this reason, follow-up telephone interviews have been conducted to supplement the online sample. How this was used following Wave 25 survey is detailed in the 'sample selection' chapter above. On an ongoing basis this is continuing to be deployed where underrepresentation of a particular group – or the need to research further questions arising from analysis – has been identified.

Another issue encountered with online surveys is 'bounce-back' of emails to invalid email accounts, and non-response suspected to be due to the survey going into 'junk' folders (whereby potential respondents may be unaware of the survey). Whilst there is no obvious bias introduced through this issue (i.e. there is no reason to suppose emails bounce/junk any more or less so for any particular demographics of interest) it does reduce the overall response rate. It was partly for this reason that Winning Moves switched from Voxco CAWI to the Survey Monkey platform shortly prior to Wave 25 being launched, as we were aware the rate of emails going to junk folders had been increasing using our previous platform, as well as a greater number of respondents encountering accessibility issues due to an ever increasing range of devices and browsers being used to access surveys. Invalid email addresses are minimal (approximately 1%) within the applicant database as they are entered as part of the scheme administration, where the contact details are used to contact the applicant about payments.

Resource is set aside in each wave for telephone interviewing to boost the number of responses achieved with particular subgroups. To determine how this resource is used, following the close of the online survey, Winning Moves:

 Analyse the sample of online responses and compare it to the overall population for that wave

- Produce a short note for discussion with BEIS on:
  - Data tables for the sample compared to the population by key database fields (e.g. type of housing, size of installation);
  - A proposal for use of the telephone resource, focused on:
    - Coverage of groups of applicants that map to scheme reforms;
    - Coverage of groups of interest identified in the wider evaluation (for example, telephone interviews may be used in the monitoring surveys to ensure a sample size large enough to support qualitative work elements);
    - Areas of under-representation compared to the population.

Telephone interviewing resource was used in Wave 25 in the following ways:

- Applicants with multiple applications within the survey timeframe. It was not practical for respondents to complete multiple surveys so instead a single qualitative conversation was conducted based closely on the online survey script with multiple applicants and for each question any differences across applications were explored.
- All biogas/methane applicants were interviewed by telephone as they were often multiple installation applicants, and the size and complexity of the plants meant that such applications were not necessarily appropriate for an online survey that largely targets one more straightforward installation.
- Online survey responses that were partially complete. Response numbers could be increased fairly quickly and using less resource than a full interview by using telephone resource to get back to those respondents who were over halfway in the online survey before they chose to drop out.
- Groups that were under-represented in the domestic or non-domestic online response. On both domestic and non-domestic, there did not seem to be proportional under-representation of a particular group compared to the database population numbers. However, there were certain groups for whom the population and therefore the total number of online interviews were small, and these needed to be boosted applicants for solar thermal and WSHP in non-domestic.

For Wave 26 no telephone interviews were conducted on the basis that:

- This wave was an additional survey, not planned when the evaluation proposal was produced. It was envisaged as a top-up to Wave 25 so an online approach was deemed sufficient assuming similar response rates were achieved to the previous wave;
- The response rates achieved were similar to those achieved for Wave 25;
- The sample of respondents was considered broadly representative of the population;
- The number of biogas/biomethane applications in the period was relatively small, and as biogas/biomethane applicants were identified as a group of interest for the qualitative work conducted by CAG it was decided this could be conducted as an online survey to minimise burden on applicants and to make cost efficiencies. This decision was also carried through to subsequent waves;

• The wider population of applications in the period was considerably smaller than that of Wave 25 – placing practical limitations on what could be achieved / how cost effective it would be to boost particular groups within the sample.

The table below outlines how telephone interviewing resource was used in Wave 27.

Table 2. Telephone interviewing resource use (Waves 27)

Survey	
27	A small telephone boost was undertaken following the first round of ongoing bi-annual monitoring surveys. This considered the following areas of interest:
	Domestic
	Following examination of representation by key groups boosts were carried out with the following groups that map to scheme reforms:
	<ul> <li>Applicants with high heat demand (greater than 30,000 kWh);</li> </ul>
	Terraced housing
	The following were also considered but discounted as requiring a boost:
	<ul> <li>Social housing landlords (including Multi-dwelling applications/shared ground loops)<sup>11</sup>; however, these were not included as the scope of research with this cluster as a key group of interest had yet to be determined.</li> </ul>
	<ul> <li>Representation of those previously using gas, as an area of interest, but where the achieved sample completing the online survey was deemed adequate</li> </ul>
	• Representation of those considering Assignment of Rights (AoR) through targeting lower income households was considered through the selection of smaller properties with lower installation costs. This would require the introduction of a screening question on income. Review of the sample also showed that only seventeen respondents had considered AoR; therefore, it was decided to be more appropriate to consider this group in future waves when awareness of AoR would have increased.
	<b>Biogas/Biomethane</b> : A telephone boost of biogas and biomethane applicants resulting in seven additional interviews were conducted. The purpose of this boost was to provide additional evidence to contribute to the synthesis in wave 3. Interviews conducted were with applicants that had a tariff rate date after reforms were announced (i.e. 15 December 2016). Interviews covered the online survey questions but also asked applicants for information on additional applications they may have made that were planned, withdrawn or rejected (See Annex 3).

<sup>&</sup>lt;sup>11</sup> If these exist in domestic RHI and as far as these can be identified with input from BEIS and Ofgem.

The table below summarises the survey modes used in each wave. It will be updated following each wave along with the more detailed table in the appendix (Annex 2) to keep track of the work undertaken in each wave for ease of reference.

Table 3 Survey mode for each wave of the RHI accredited applicant survey by wave.

Survey	Applicant group	Main survey mode	Telephone boost?
25	Domestic	Online	Yes
	Non-domestic	Online	Yes
	Biogas/biomethane	Telephone*	No
26	Domestic	Online	No
	Non-domestic		
	Biogas/biomethane		
27	Domestic	Online	Yes
	Non-domestic		No
	Biogas/biomethane		Yes

\* due to complexity and multiple applications

Applicants selected for participation in the boost telephone interviews include all applicants within that sub-group. The full sub-group is added to a call list, randomised, and telephone calls are made until the assigned quota is completed. This approximates an opportunity sample whereby those who answer the phone are included in the sample.

# Survey design

Separate survey scripts have been produced for domestic, non-domestic and biogas / biomethane RHI accredited applicants.

The surveys for Wave 25 were adapted from the scripts used in Waves 1-24 of the monitoring surveys (or wave 2 of the non-domestic surveys) conducted during the previous evaluation of the RHI. The previous survey scripts were reviewed to understand fit with evaluation needs and required amendments made.

Each survey script has since been reviewed and adjusted prior to launching each subsequent wave. The process followed to date has been as follows:

- BEIS specify any key areas for survey changes (and sometimes specify question wording) for the upcoming wave, this includes:
  - Adding or removing questions to support wider evidence needs;
  - Retaining questions under review in relation to the wider evaluation needs and ongoing policy changes.
- Winning Moves produce a draft survey based on input from BEIS and the current understanding of priorities and needs for our consortium partners.
- BEIS review the draft survey and provide comments.
- CAG and other consortium partners review and comment from the point of view of ensuring the survey questions will produce useful responses / data to feed into answering theory of change hypotheses and other workstream objectives.
- In early waves there was also liaison with Ofgem<sup>12</sup> to minimise survey length (and so overburdening respondents) and avoid duplicating data gathering.
- Following any further discussion / iterations, a final survey is agreed.

Efforts were made to keep the survey questions as comparable as possible in terms of focus, wording and options to enable a consistent dataset from Wave 1.

Due to the changes made and the time elapsed since the previous evaluation, a full pilot of Wave 25 was conducted to inform considerations of question comprehensibility, survey length, whether questions were eliciting a sufficient quality of response etc. This is described in the following section.

#### Pilot

Due to the changes made and the time elapsed since the previous evaluation, a full pilot of Wave 25 was conducted to inform considerations of question comprehensibility, survey length, whether questions were eliciting a sufficient quality of response etc. This is summarised

<sup>&</sup>lt;sup>12</sup> As they survey applicants soon after their application.

in the following section. The table below provides the key numbers on the pilots for each of the respondent groups:

Metric	Domestic	Non-domestic	Biogas / biomethane	
Sample invited to participate in the pilot	346 applicants, randomly selected across dates of application and technology.	200 applicants, randomly selected across dates of application and technology.	The survey was reviewed by several stakeholders and telephone interviews were conducted with two volunteer applicant organisations	
Number (and proportion) clicking on the link to access the survey	132 (51% of those that opened the email and 38% of the whole pilot sample) clicked the link to start the survey.	61 (53% of those that opened the email and 31% of the whole pilot sample) clicked the link to start the survey.		
Number (and proportion) completing the survey	88 (25% of the whole pilot sample) completed the survey.	37 (18.5% of the whole pilot sample) completed the survey.	The piloted sample was not therefore a fully representative	
Representativeness	The % splits of application profiles (in terms of technology and year of application) for those that completed the survey, very closely matched the % of the overall sample i.e. we could be confident that the pilot responses were representative of the wider population.		sample, but testing was deemed adequate to progress with the survey.	

Table 4. Summar	y of the Wav	e 25 pilot by	applicant group.
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The key changes arising from the pilot were as follows:

- The pilot found that only around half of those opening the email advertising the survey were then clicking on the link to the survey itself. In response the introduction to the survey in both the email containing the link and within the survey itself was made more concise.
- The pilot found a substantial number of 'partial completes' i.e. respondents starting but not completing the survey. To minimise drop out, overall survey length was reduced (through removing certain questions and reducing options list size) and the use of non-mandatory questions was retained.
- Further detail on the pilot including the precise changes made to individual questions etc. can be found in the specific pilot reports from Wave 25 ('retrospective').

## Summary of key survey changes

The most recent RHI accredited applicant survey administered to domestic, non-domestic and biogas/biomethane applicants is included in Annex 5. However, key changes to note between each stage are outlined in the table below.

## Table 5. Summary of changes to survey scripts made in each wave of the RHI accredited applicant survey.

Stage	Key changes in the applicant monitoring surveys		
25 (compared to waves 1-24)	• The introduction of questions on the reforms to the RHI. Wave 25 survey respondents were asked about their awareness of the planned / announced reforms and the influence of these on their application e.g. accelerating their decision to apply / install etc.		
	<ul> <li>Inclusion in the attribution section of questions as to whether the RHI led to applicants installing technologies more quickly (in addition to just 'installed at all' or 'installed a different technology').</li> </ul>		
	<ul> <li>Inclusion of questions on the performance of the RHT vs. the previous system.</li> </ul>		
	Removing certain satisfaction questions on RHTs and RHI application process satisfaction, where BEIS felt there was already a good understanding of and historic data record of issues.		
26 (compared to wave 25)	On reform awareness and influence, the questions were similar but could be phrased in terms of the actual reforms as introduced rather than anticipated.		
	For non-domestic respondents, tariff guarantees were introduced in May 2018, and so the addition of several questions exploring their experience of applying for tariff guarantees and any impact from the delay to their implementation were introduced.		
	The following question sets were condensed:		
	<ul> <li>Question on concerns about the RHT which was previously asked separately – with slightly different options – for biomass installers were combined.</li> </ul>		
	<ul> <li>Two questions on energy efficiency technologies installed in the home and RHT influence on this were amalgamated.</li> </ul>		
	• Two questions on RHT faults encountered and whether these were covered or if there were additional costs were combined.		
	Addition of the following questions:		

Stage	Key changes in the applicant monitoring surveys
	<ul> <li>Question exploring whether new build installers were advised that they had to integrate renewables (in response to a theory on reasons for RHT installation).</li> </ul>
	Question on electricity tariff switching following RHT installation (BEIS request).
	<ul> <li>Question clarifying that any upgrade / improvement work costs were included in the 'total' costs quoted by respondents.</li> </ul>
	• Question on biomass installer satisfaction with the quality of their fuel (in response to demand theory).
	<ul> <li>Question exploring whether RHI influenced the size of the selected RHT (in response to demand theory).</li> </ul>
	<ul> <li>Question exploring why the RHI influenced a particular choice of RHT, where the respondent indicates that they might have gone for an alternative RHT otherwise (in order to better understand RHI influence / applicant reasoning).</li> </ul>
	<ul> <li>Question exploring why respondents would have installed the same technology anyway without the RHI (to more fully unpick non- attribution responses).</li> </ul>
	• Where respondents acknowledged that the reforms influenced at least one aspect of their RHI application / RHT installation, a question ascertaining which element(s) of the reforms in particular (in order to more fully understand reform influence).
	<ul> <li>Question asking respondents to rate satisfaction with the ease of finding an installer for their RHT.</li> </ul>
	• For biogas respondents, clarification that their installation is fully operational and producing heat (in response to a BEIS request as a small number of applicants aren't submitting readings and could have a 'dormant' application).
	<ul> <li>For biogas respondents, whether and why they opted out of the new feedstock waste restrictions and increased tariff.</li> </ul>
	Removal of the following questions:
	• Open ended question exploring why conventional heating systems had been retained (where this was the case). The rationale tended to be nervousness about the RHT, which was recorded in other questions anyway.
	<ul> <li>Questions exploring how much slower / quicker a RHT was installed where respondents attributed this to RHI. Respondents found such</li> </ul>

Stage	Key changes in the applicant monitoring surveys
	estimates difficult and it was not felt to be producing useful / reliable data.
	<ul> <li>Question on finance used for any energy efficiency measures (lower priority; removed to make space for new questions).</li> </ul>
	• Question on who they recommended the RHI to, and whether those people acted on the recommendation, asked to those who said they had recommended the RHI to others (lower priority; removed to make space for new questions, especially as the quality of responses varied).
	• Question exploring how much ongoing costs differed from the respondent's original expectations, where this was the case (lower priority; removed to make space for new questions, especially as the quality of responses varied).
	Editing of the following questions:
	<ul> <li>Asking biomass installers to estimate the 'per purchase' cost of fuel rather than 'per unit'.</li> </ul>
	<ul> <li>Asking what alternative technology(ies) 'might' – rather than 'would' - have been chosen in the absence of RHI (recognising that several options may have been considered).</li> </ul>
	• Added 'excluding seasonal changes' to the question exploring whether respondents are using their RHT less (as many in the first wave simply described using it less in Summer which was not the aim of the question).
	<ul> <li>For biogas installers, editing of the reform questions to align them more closely with those asked to other non-domestic respondents.</li> </ul>
	Option addition or removal on questions with long options lists based upon the previous survey findings i.e. remove an option rarely selected, add an option cited often in the 'other?' open end boxes. Option list amendments were as follows:
	<ul> <li>Motivations to install a RHT – added 'salesperson / installer' (to test a CAG demand theory) and removed 'Green Deal' (as no longer relevant for the Wave 26 cohort).</li> </ul>
	<ul> <li>Sources of advice received - removal of the 'Green Deal assessor' (as no longer relevant for the Wave 26 cohort).</li> </ul>
	<ul> <li>Sources of funding for the RHT – 'Green Deal Finance' removed (as no longer relevant for the Wave 26 cohort).</li> </ul>

Stage	Key changes in the applicant monitoring surveys		
	<ul> <li>Streamlined the number of options on the question ascertaining how long the respondent had been at their property.</li> </ul>		
	<ul> <li>Streamlined the number of options on the question exploring household income.</li> </ul>		
	<ul> <li>Reasons for retaining an alternative, conventional heating system – added an option for respondents to clearly state that 'the RHT has met their needs to date and the alternative system is precautionary'.</li> </ul>		
27 (compared to wave 26)	<ul> <li>A set of four questions on Assignment of Rights were added to the domestic survey.</li> </ul>		

# Maximising response rates

The RHI applicant audience is expected to be an engaged audience, based on historic survey response rates where the domestic survey achieved an overall response rate of 42% and the non-domestic survey achieved a 30 and 36% response rate across the two waves conducted. That said, a number of measures have been taken to try to maximize response rates for the applicant monitoring surveys:

- A compelling introduction to the survey, clearly stating the purpose of the survey and the value of participating and reassuring on data protection. The introduction also signposts a contact within BEIS to reassure respondents of the survey's validity.
- On the domestic survey, inclusion of an incentive: entry to a prize draw for those who complete the survey.
- Applicants are also invited to contact a named survey manager at Winning Moves should they have any queries on the survey / encounter technical issues.
- Managing the length of the survey, though due to the range of stakeholders involved in survey design and commensurate areas of interest this has been challenging. Respondents partially completing surveys and then dropping out has been significant (14% for the domestic survey and 39% for the non-domestic survey in the most recent wave Wave 27<sup>13</sup>) but would likely have been more so without the efforts to limit survey length. It should be noted, Winning Moves also uses telephone resource to re-contact partial responses and complete the survey and so this percentage is reduced in final numbers.
- Formatting survey questions to be 'non-mandatory' i.e. respondents can skip questions. Whilst this can affect quality (e.g. missing data) it in theory reduces the likelihood of respondents dropping out as they can if needed move on from a question.
- Following the survey launch weekly reminder emails were sent to those yet to respond. Winning Moves have found that the most effective time to send reminders is on a Monday morning for non-domestic applicants, and most successful with domestic applicants when sent on a Friday, allowing completion over the weekend. Reminders also note the survey closing date to further motivate timely responses.
- Telephone follow ups have included quotas focusing on specific groups of interest to boost samples for under-represented groups.

Response rates have been good throughout the evaluation to date, comparing favourably with response rates in Waves 1-24. This is especially when considering that bounced and autojunking of emails likely reduced the population of potential respondents. Response rates achieved for each online survey are as follows, within Waves 25 and 27 response rates were further improved with telephone boost (See Annex 2):

<sup>&</sup>lt;sup>13</sup> Based on the percentage of all responses that are partial i.e. start to complete the survey but do not continue to the final question.

Survey	Applicant group	Population <sup>14</sup>	On-line survey response rate <sup>15</sup>
25 <sup>16</sup>	Domestic	11,591	19%
	Non-domestic	7,208	7%
	Biogas/biomethane	816	N/A: fixed telephone interview quota
26	Domestic	4,241	35%
	Non-domestic	305	17%
	Biogas/biomethane	20	30%
27	Domestic	3,421	19%
	Non-domestic	50	18%
	Biogas/biomethane	19	11%
	Biogas/biomethane	54	6%

## Table 6. Table summarising the population and on-line response rate achieved in each wave.

<sup>&</sup>lt;sup>14</sup> All accredited applications with an email in the database supplied by BEIS.

<sup>&</sup>lt;sup>15</sup> Invalid emails and bounce-backs, accounting for no more than 1% of total population, are still included in the population count and therefore treated as non-response. The response rate would therefore be marginally higher if only those known to receive the survey without a bounce back were included in the population.

<sup>&</sup>lt;sup>16</sup> It was anticipated that response rate would be lower for the first retrospective survey due to the large time elapsed for some sample between application and survey (e.g. early 2015 for some non-domestic sample). However, analysis of response rates by application and accreditation date did not seem to bear out this hypothesis.

# Database receipt and processing

The database of all historic applicants to the RHI is shared via a secure portal by BEIS prior to the survey launch for each stage (for ongoing surveys, every six months). Each row is an application, not an applicant, and includes multiple lines per application where an application may have been cancelled / rejected and the applicant re-applied for the same property and technology.

Data files contain all historic applications data i.e. covering all applications, regardless of whether approved, from the beginning of the policy. BEIS send two separate data files: one each for domestic and non-domestic applications, the latter including the biogas / biomethane applications. The full applicant database is shared with Winning Moves for each wave as it is updated each month with application status.

The following steps are taken to create the file imported into the online surveying software:

- Ensuring only successful applications are included (as per the 'current status' field) i.e. where application rows are labelled as 'refused' or 'cancelled' these are removed<sup>17</sup>.
- For Wave 26, separation of applicants with multiple successful applications into a separate database for telephone surveying. The 1st step is taken first because an organisation may have previous failed applications for the same eventually successful application, but these are not 'multiple applicants' as such. Equally we wanted to conduct the 2nd step before removing out-of-range date rows as this is an arbitrary cut-off for the evaluation, but organisations may have applied for multiple technologies both sides of this date divide and so still be multiple applicants.
- Selecting only applications that fit within the time window of focus for that survey wave and for that type of applicant. For domestic applications the date used to filter was the 'tariff rate date'; for non-domestic applications the date used to filter was the 'accreditation date'.
- Entries without email addresses were excluded as these applicants could not receive the survey. These could be retained for telephone research.
- For Wave 26, removal of pilot completes / opt outs.
- For the non-domestic database, separation of the biogas/biomethane applications from the others.
- In waves subsequent to Wave 26, so with a tighter timeframe of interest (and so
  expected fewer applicants with multiple applications within that timeframe), deduplication of the 'email address' field to ensure each applicant only receives one
  survey invitation email.

<sup>&</sup>lt;sup>17</sup> For the non-domestic database in Wave 25, there were 94 rows in the final database for which there was also a row in the original database comprising an ostensibly accredited application but with an 'exclude' note in the next column. The original application was in a few cases pre-2015 but the eventual accreditation of that application (which they presumably had to re-submit, hence the discrete row in the original database) was post-1st Jan 2015. These cases were included in the sample and the 'exclude' application rows ignored.

- A final matching process to ensure all final database records match the accreditation date and technology in the original database.
- Within the database to import and in line with data protection, removal of all fields and data except those necessary to the delivery of the survey. Four fields were kept:
  - $\circ$  Email address: in order to be able to send the survey invitation.
  - RHI number: an anonymized field that would enable the survey team to link a response to the original database if required.
  - Technology type for which the RHI was applied: this was necessary for routing i.e. certain questions were asked or not asked based upon the technology. The technology name was also included in the introduction to the survey to assist respondent recall and ensure they were focusing on the correct application and technology when completing the survey and also in question wording allowing the survey to be customised to the applicant.
  - Tariff rate / accreditation / submission date: this was necessary for routing i.e. certain questions were asked or not asked or asked in different ways (e.g. on the reform awareness and influence section) depending upon the precise date. The accreditation date was also included in the introduction to the survey to assist respondent recall and ensure they were focusing on the correct application and technology when completing the survey and also in question wording allowing the survey to be customised to the applicant.

## **Dataset preparation**

Following survey completion and obtaining of the response datasets, a number of steps were taken to creating files ready for analysis; all steps – and subsequent analysis - were undertaken in SPSS:

- Removal of partial responses: there were a number of dataset records which were
  partially complete as the respondent had stopped completing the survey but the
  responses to that point were recorded. There was a discussion as to whether to include
  these especially where the respondent had responded to key questions e.g. around
  attribution. It was ultimately agreed to remove these records (and so their responses)
  from the dataset as there are quality considerations on partially completed interviews
  (e.g. at what point was the respondent rushing / not concentrating) and completed
  survey sample sizes were large enough to mean the addition of these relatively small
  number of partial completes was not critical for boosting sample size or reducing
  confidence intervals. Responses from those completing the survey, but not responding
  to all questions, are retained, as we can be more confident they have given a
  considered response to the questions to which they have responded.
- Dataset merging and adding records: for Wave 25, it was necessary to merge the online • and telephone survey datasets for each of the domestic and non-domestic groups. For all three groups (domestic, non-domestic and biogas), an application dataset was created to split responses from multiple applicants into responses per application. This step has not been required in subsequent waves as cases of multiple applications from the same source within the shorter time period are much less common and where applicants do have multiple applications one is chosen at random for the purposes of the survey. For selected key variables, it was necessary to merge the relevant variables from the latest wave into a dataset of all historic monitoring survey responses. This required some re-coding to ensure as far as possible that the codes / options for the questions being analysed were comparable e.g. the options for 'motivations to install an RHT' have altered since Wave 1 and therefore headline analysis of all historic survey data for that question required consistent codes to be established. Work has been undertaken to create a single dataset of all monitoring responses received from successful domestic and non-domestic applicants since monitoring began.
- Data cleaning: this is especially important for the online survey as there was no interviewer to pick up on inconsistencies etc. The cleaning includes the following:
  - Where questions ask for an open-end response and then for the respondent to also choose a coded/categorical response, checking these to ensure consistency, potentially recoding based on the open-end response if obviously contradictory.
  - Where respondents have selected 'other' on questions featuring options lists, checking the attached open-end response to see whether the closed question response can be re-coded in the existing code frame or whether – if there are sufficient 'other' of a particular type – a new code/option should be created.
  - Sense checking any numeric responses and creating a variable to ensure these are in a uniform unit and suitable for analysis e.g. any wording removed.

## Weighting

Weighting is used to correct potential discrepancies between a sample obtained through a survey and the underlying population with respect to key variables.

Weights were calculated through a process called calibrated weighting. The primary aim of this process is to create weighting factors by considering several variables at the same time. For Waves 26-27 domestic survey, these variables are:

- Technology type
- Property type
- Floor space
- Previous heating system
- Number of occupants

For the non-domestic survey, the weighting variables were:

- Technology type
- Sector
- Government Office Region
- Whether the business is on or off the gas grid

For Wave 25 domestic and non-domestic surveys, the same method was followed, with the only difference that an additional variable was used: whether the applicant submitting the application had also submitted other applications or not.

In Waves 25-27, domestic and non-domestic, weights were calculated at the application level only.

However, historically, weights had been calculated at both the application and the applicant level. The applicant weights from the historical dataset are not compatible with weights from Wave 25-27 datasets and, therefore caution should be taken when making comparisons over time. Within the domestic data there are few implications of this change in weighting strategy as 97% of applicants make only one application. Within the non-domestic scheme the implications are more pronounced, with 87% of applicants make more than one application, however this is still a minority issue. Considerations related to multiple applicants are discussed in the Limitations section below.

The calibrated weighting method works as follows:

• A set of inflationary weights with respect to the first weighting variable is created:

 $weight_1 = \frac{application\ population\ frequency}{survey\ sample\ frequency}$ 

Thus, for example, if there are 15 ground source heat pumps in the application population and 5 in the sample, the weighting factor for applications for ground source heat pumps would be 15/5=3.

- The dataset is then weighted using this set of weights.
- A weighted frequency of the next weighting variable is calculated.
- Using the weighted frequency from Step 3, a set of inflationary weights with respect to the next weighting variable is created. These new weights are calculated as follows:

 $weight_2 = weight_1 * \frac{application\ population\ proportion}{weighted\ survey\ sample\ proportion}$ 

Thus, for example, if terraced houses account for 50% of all applications and, after weighting the sample with the set of weights from Step 1, they account for 80% of all applications in the survey sample, then the weighting factor for terraced houses applying for a ground source heat pump is  $3^{*}(50/80)=1.875$ .

These steps are then followed for all weighting variables in turn.

There is a final step in the end, whereby the weights are again calibrated with respect to technology type (which is the first weighting variable for both the domestic and non-domestic surveys), as this variable is considered to be the most important weighting variable. The weights obtained from this final step are the final weights, and the ones that can be found in the combined dataset.

Weights from Waves 25-27 datasets are inflationary, i.e. they gross up to the application population rather than the sample. Conversely, weights from the historical dataset are non-inflationary, meaning they sum up to the total sample. When it comes to simple frequencies and crosstabulations there is no difference. However, there would be a difference when estimating a total quantity, e.g. when estimating the total installation cost incurred by applicants. In the latter case, only inflationary weights should be used.

For combining weights from all datasets into one single weighting variable, historical weights were converted into inflationary weights. Thus, the combined weighting variable contains inflationary weights only.

# Data analysis and outputs

To satisfy the needs of the wider evaluation project and the evidence needs of BEIS, there are multiple outputs from the surveys. The outputs are described in detail below, but in summary they are:

- An amalgamated dataset this merges data from all waves of the applicant surveys to allow for analysis of the entire cohort and of changes over time. This takes the form of an SPSS dataset.
- Internal reporting after each wave of surveys a summary of findings against key
  questions is reported to BEIS. This summary ensures that BEIS have up to date
  evidence to support the policy making process. This takes the form of PowerPoint
  summaries.
- Analysis against evaluation questions to support the wider evaluation, findings are reported to BEIS and other evaluation consortium partners. This enables CAG Consultants to feed the data into the ongoing evidence synthesis process that is part of the theory-based evaluation method. This takes the form of providing the relevant raw data as well as summaries of the analysis conducted.
- **Data tables** to support the publication of findings based on the survey evidence, data tables are produced. These excel files provide the responses to every survey question cross-tabulated against key variables (including technology type and application date)

The domestic, non-domestic and biogas/biomethane samples are in separate datasets and are analysed separately, though the headline findings from the latter were included in the non-domestic dashboard. Analysis was drawn from not only the survey response data but also the original application data. Analysis is done by application (in order to reflect potential differences in RHI additionality or reform influence between different applications).

Analysis of historic data had been primarily done by application too, except for very few questions which were being analysed at the applicant level. As all questions are currently analysed by application, results related to these specific questions that had been reported historically might differ from the results currently reported in the data tables. Analysis contrasting results by application with results by applicant has shown that these differences, where they exist, are minimal, rarely being close to and never exceeding one percentage point.

## Amalgamated Dataset

In September 2019, all available survey data from Waves 1 to 27, were merged into one single dataset. This process brings together data from surveys conducted historically prior to Winning Moves' involvement. Due to changes in the survey methodology and questions over time, BEIS and Winning Moves agreed that the amalgamated dataset contains:

• All variables which are comparable across all surveys, including the ones conducted historically. On very few occasions, data transformation of historical variables was necessary to ensure comparability across surveys.

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- All variables from the surveys conducted by Winning Moves, unless they had been removed by the time wave 27 was delivered.
- Profiling information from the applicant database, including:
  - Technology Type
  - o Tariff rate date (domestic)/First submission date (non-domestic)
  - Floorspace (domestic)
  - o Heat use
  - Heat demand (domestic)
  - o Connection to gas grid
  - Activity sector (non-domestic)
  - o Government Office Region
- For certain multiple response questions, two versions were retained: one with options available in all surveys, including the historical surveys, and one with the options available in the surveys conducted by Winning Moves.
- All other variables were removed.

There are a number of outputs from the applicant monitoring survey and the quantity and type of analysis and reporting of that differs for each; these outputs – and the commensurate analysis and reporting approaches – are summarised in the table below. To produce these outputs a number of questions that could be amalgamated to provide a more binary / headline response are created e.g. the surveys had several questions on additionality which could feed into a single overall categorisation; these were used to create one amalgamated additionality variable for headline analysis. The full set of additional variables created is set out in the analysis plan produced following Wave 25.

## Internal reporting

The internal reporting comprises analysis of the merged dataset of all responses from all waves as well as key applicant profile information provided by the application data. Combining these two data sources allows BEIS access to up to date information on how the makeup of the RHI applicants is changing over time.

The outputs include data on:

- Property and technology profile including technology type, installation size, property size, heating use, household/business size and source of finance
- Key survey questions related to applicant motivation and knowledge including selfreported additionality, awareness and influence of scheme reforms, drivers to installation and satisfaction with the technology.

Trends in key sample-based statistics are examined across the entire time period since the scheme's launch and statistically significant differences between the twelve months – or a

#### RHI accredited applicant survey: technical method

slightly longer time period for non-domestic data due to the smaller sample size - preceding fieldwork and the time period before that are highlighted. (NB statistics drawn from the application data are not sample based, so significance tests do not apply).

Waves 1-24 surveys essentially excluded biogas/methane so for most non-domestic analysis these are excluded, which means the findings are directly comparable. Biogas/methane data is included in the non-domestic dashboard where there is an overview of a question by technology type.

For Wave 27 (the first ongoing survey) where the population of non-domestic applicants and therefore number of responses received was too small for meaningful analysis, it was agreed that no dashboard should be produced for non-domestic in that wave. We will review with BEIS the frequency and design of the non-domestic dashboard for future waves in light of the likely number of responses we will achieve.

## Analysis against evaluation questions

Within each round Winning Moves also carries out bespoke analysis to fit with the wider evaluation. This entails a deep dive into specific topics of interest or reviewing evidence that may underpin realist theories as specified by CAG consultants. This includes review of data across the entire scheme but also review of evidence collated for specific audiences e.g. biogas/biomethane applicants.

## Data tables

Data tables provide tabular outputs for every question in the survey and for any variables created post-data collection. The output comprises weighted frequencies on the responses to each individual question and analysis of each question by key profile variables e.g. technology. Where the question is multiple-response (more than option is allowed to be picked by respondents), responses without any option picked are excluded from the analysis.

Wherever the sample size is below 50, percentages are not reported with caveats. The precise suppression and other rules applied are detailed in each set of data tables. Though tables have been produced for the nom-domestic data too, as of May 2019 it was decided not to produce them for individual waves due to the small sample size likely to be achieved in each wave.

The data tables published alongside each report draws on the waves that are relevant to them. For example, previous reports have included data tables for surveys conducted around a period of reforms (Waves 25 and 26), however, future publications may include data tables based on the amalgamated dataset encompassing all waves.

## Limitations

This section outlines the limitations which should be kept in mind when using the evidence from these surveys.

#### Mixed mode surveys

Waves 25 onwards take a mixed method approach to data collection<sup>18</sup>. The primary method of data collection is an online survey (this is consistent with waves 1-24) however telephone boosts are used to address low response numbers for priority groups of interest or small sub-groups. The aim here is not to increase response rates, as a proportion of the population, but to increase the total number of responses in these smaller sub-groups to ensure sub-group analysis can be supported. The use of a mixed method approach introduced the potential for mode specific differences to be introduced into the survey findings. However, the extent of these differences are limited as the telephone surveys have resulted in only a small number of 5,646 responding applications over this period.

#### Changes in questions over time

Since the first wave of this survey there have been several changes to the questions included in the survey. The largest change took place between waves 24 and 25 (aligned with a change in evaluation contract), however, there have been small changes over time. At a minimum this limits the ability to analyse trends across all of the latest questions going back to the start of the scheme. However, it is also possible that the introduction of new questions has an impact on other survey responses, for example by introducing question order effects or reducing participant engagement by increasing the overall length of the survey.

#### **Responses from multiple applicants**

To reduce participant burden each applicant is only contacted once, for multiple applicants this will be their first application to the RHI. The survey data therefore will have therefore have a bias towards fist applications. The impact of this is not known, for example, does the experience of the RHI or the installed technology vary across subsequent applications?

The impact of this limitation is most likely to be felt among those applicant types who more frequently apply for multiple application, this is known to be housing associations or housing providers (since they own numerous properties into which they install renewable heating systems) and energy service companies (where their business model involved installing and running renewable heating systems which provide heat for another organisation) and energy consultants (who may takes responsibility for the application process and management on behalf of other organisations).

The frequency of multiple applications is provided below.

• Among all domestic applications to the RHI, 3% of applications were from an applicant who submitted more than one application.

<sup>&</sup>lt;sup>18</sup> Telephone boosts were considered for wave 27 but the decision was that they were not necessary due to satisfactory response numbers for required sub-groups.

#### RHI accredited applicant survey: technical method

• Among all non-domestic applications to the RHI, 13% of applications were from an applicant who made more than one application. Over half of these, 7%, made between 2-5 applications.

#### Changes in weighting approach

As described in the Weighting section of this annex, waves 25-27 of this survey applied application level weighting. In contrast, waves 1-24 applied both application and applicant weighting, with applicant weighted results being the primary output. This change in weighing will limit comparisons which can be drawn between previous and new evaluation publications. However, as described above, this issue is limited to multiple applicants who make up a minority of the applications to the RHI.

To overcome the difficulty comparing over time, all future publications of this survey data will, where possible, make use of an amalgamated dataset which brings together all waves of the survey and applies a consistent application weight.

## Annexes

## Annex 1: Accreditation date

The table below outlines the database field used in defining accreditation date for each wave. For Waves 25-27, BEIS agreed that accreditation date should be used for non-domestic but advised that tariff rate date should be used for domestic. Tariff rate date is applied at point of application and is close to accreditation date for Domestic, but for non-domestic the long accreditation process means that tariff rate date can often be quite different from final accreditation date, hence accreditation date is used instead.

Table 7.	Data field used to	o select sample for	each wave of	the RHI accredited
applicar	nt survey.			

Survey wave	Applicant group	Date field used
25	Domestic	Tariff rate date
	Non-domestic	Accreditation date
	Biogas/biomethane	Accreditation date
26	Domestic	Tariff rate date
	Non-domestic	Accreditation date
	Biogas/biomethane	Accreditation date
27	Domestic	Tariff rate date
	Non-domestic	Accreditation date
	Biogas/biomethane	Accreditation date

#### Annex 2: Summary of work undertaken and number of responses

Response Number of Successful rate **Primary data** Dates the interviews **Total number** Overall application date Number of (primary Telephone Applicant group collection Population\* conducted of responses Survev survey response range for sample responses data boost mode was active (telephone for analysis rate\*\* selection collection boost) mode)\*\* Domestic 1st April 2016 -Online Nov 2017 11,591 2,251 19% Yes 163 (80 2,414 21% Wave 20th September – Jan 2018 25 distinct 2017 respondents responsible for multiple applications) Dec 2017 7,208 483 7% 275 (100 Non-domestic 1st January 2015 Online Yes 758 11% - 20th September – Jan 2018 distinct 2017 respondents responsible for multiple applications) Biogas/biomethane Telephone Jan– Feb 816 189 N/A fixed No n/a 189 N/A fixed 2018 telephone telephone quota quota

Table 8. Summary of work undertaken in each wave of the RHI accredited applicant survey.

#### RHI accredited applicant survey: technical method

Survey	Applicant group	Successful application date range for sample selection	Primary data collection mode	Dates the survey was active	Population*	Number of responses	Response rate (primary data collection mode)**	Telephone boost	Number of interviews conducted (telephone boost)	Total number of responses for analysis	Overall response rate**
Wave 26	Domestic	21st September 2017 – 31st	Online	Oct-Nov 2018	4,241	1,503	35%	No	n/a	1,503	35%
	Non-domestic	August 2018			305	53	17%	No	n/a	53	17%
	Biogas/biomethane				20	6	30%	No	n/a	6	30%
Wave 27	Domestic	1st September 2018 – 28th February 2019	1st SeptemberOnline2018 – 28th	Online April / May 2019	3,421	666	19%	Yes	43	709	21%
	Non-domestic		ary 2019		50	9	18%	No	n/a	9 (due to small sample size no analysis was conducted)	18%
	Biogas / biomethane				19	2	11%	Yes	3	5	26%

\* All accredited applications with an email in the database supplied by BEIS. \*\*Invalid emails and bounce-backs, accounting for no more than 1% of total population, are still included in the population count and therefore treated as non-response. The response rate would therefore be marginally higher if only those known to receive the survey without a bounce back were included in the population.

# Annex 3: Additional questions asked to Biogas/Biomethane applicants interviewed by telephone in Wave 27

## Table 9. Additional questions asked to Biogas/Biomethane applicants interviewed by telephone in Wave 27.

Question	Response options
Has your organisation previously planned any other biomethane/biogas installations which did not proceed to the point of making an application to the RHI ?	Yes/No
How many did not proceed to the point of making an application?	Capture number
For each planned application, please could you tell me why did you not proceed with this application?	Unable to secure financially viable injection point Unable to secure site Unable to secure planning permission Unable to secure relevant environmental permits Unable to secure cost-effective access to feedstocks Unable to secure feedstocks which met feedstock requirements introduced in December 2016 Supply chain constraints, such as access to technology, contractor, consultants/advisers Unable to secure project finance Other (please specify)
Can you confirm what technology/technologies were planned for these installations?	Bio-methane injection Biogas CHP Biogas heat only Combination of above Gasification plant"
What sources of finance would have been sought for these installations?	Grant External Private Equity Bank Ioan Asset Finance Package The organisation's own finances, including balance sheet Don't know Prefer not to say Other (please specify)

Question	Response options
What type of feedstock was intended for these installations? [predominant one]	Local authority waste / food waste collected by local authority Industrial food waste Commercial food waste Industrial byproduct or waste Agricultural byproduct / residues / crop wastes Energy crops Sewage Don't know Other
Has your organisation previously planned any other biomethane/biogas installations for which the application was withdrawn?	Yes/No
How many were withdrawn?	Capture number
For each withdrawn application, please could you tell me why did you not proceed with this application?	Unable to secure financially viable injection point Unable to secure site Unable to secure planning permission Unable to secure relevant environmental permits Unable to secure cost-effective access to feedstocks Unable to secure feedstocks which met feedstock requirements introduced in December 2016 Supply chain constraints, such as access to technology, contractor, consultants/advisers Unable to secure project finance Other (please specify)
Can you confirm what technology/technologies were planned for these installations?	Bio-methane injection Biogas CHP Biogas heat only Combination of above Gasification plant"
What sources of finance would have been sought for these installations	Grant External Private Equity Bank Ioan Asset Finance Package The organisation's own finances, including balance sheet Don't know Prefer not to say Other (please specify)

Question	Response options
What type of feedstock was intended for these installations? [predominant one]	Local authority waste / food waste collected by local authority Industrial food waste Commercial food waste Industrial byproduct or waste Agricultural byproduct / residues / crop wastes Energy crops Sewage Don't know Other
Has your organisation previously planned any other biomethane/biogas installations for which the application was rejected?	Yes/No
How many were rejected?	Capture number
Can you confirm what technology/technologies were planned for these installations?	Unable to secure financially viable injection point Unable to secure site Unable to secure planning permission Unable to secure relevant environmental permits Unable to secure cost-effective access to feedstocks Unable to secure feedstocks which met feedstock requirements introduced in December 2016 Supply chain constraints, such as access to technology, contractor, consultants/advisers Unable to secure project finance Other (please specify)
What sources of finance would have been sought for these installations?	Grant External Private Equity Bank Ioan Asset Finance Package The organisation's own finances, including balance sheet Don't know Prefer not to say Other (please specify)

Question	Response options
What type of feedstock was intended for these installations? [predominant one]	Local authority waste / food waste collected by local authority Industrial food waste Commercial food waste Industrial byproduct or waste Agricultural byproduct / residues / crop wastes Energy crops Sewage Don't know Other

## Annex 5: Survey scripts

The files below represent the survey scripts used in the most recent wave of monitoring.

Survey	Wave	File
Domestic	27	Evaluation of the Renewable Heat Inc
Non-domestic	27	Evaluation of the Renewable Heat Inc
Biogas/biomethane	27	Evaluation of the Renewable Heat Inc

This publication is available from: <a href="http://www.gov.uk/government/publications/rhi-evaluation-evidence-report-biomethane-installations">www.gov.uk/government/publications/rhi-evaluation-evidence-report-biomethane-installations</a>

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