



Department for  
Business, Energy  
& Industrial Strategy

# Evaluation of the reformed Renewable Heat Incentive

Biomethane Applicant Fieldwork Technical  
Annex C: Data from the detailed applicant  
monitoring and qualitative research



**OGL**

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# Introduction

The Department for Business, Energy and Industrial Strategy has commissioned an evaluation of the reformed Renewable Heat Incentive (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.

In particular, this annex focuses on one piece of analysis – the amalgamation of data from the qualitative research and detailed applicant monitoring.

The biomethane evidence report provides evidence from both quantitative applicant surveys as well as qualitative applicant interviews. With small samples in both workstreams, primarily due to the small number of biomethane applications, analysis was undertaken to draw together both the survey and interview data in order to provide a clear narrative.

As noted in biomethane evidence report, there is limited scope for statistical reporting from the detailed applicant monitoring workstream due to the relatively small number of biomethane applications and, therefore, responses. In line with the aim of this report to provide insight by conducting synthesis of the available evidence, evidence from both the applicant monitoring surveys and the qualitative applicant interviews has been amalgamated for analysis.

A secondary desk-based synthesis exercise was undertaken to amalgamate data on those topics which were covered in both the detailed applicant monitoring surveys and qualitative research. This annex explains how this amalgamation process was undertaken and includes the data tables, from which the analysis in the main synthesis report is drawn.

This novel approach to analysis ensures that key findings can be succinctly presented to allow the reader to draw conclusions and reduces the risk that conclusions are drawn from each small sample dataset in isolation. The larger sample size achieved by combining the data sources also avoids mode effect and non-response biases that may be introduced when relying on the small samples separately. Despite these benefits, caution should be taken when interpreting this data and appropriate caveats are applied to the reporting.

# Methodology

## Qualitative Research

Full details of the approach and methodology adopted for the qualitative research is presented in Annex A1 - Biomethane Applicant Fieldwork Working Paper which is published alongside the synthesis report.

Qualitative research, in the form of in-depth semi-structured telephone interviews, was undertaken with 18 RHI applicants and nine wider stakeholders involved in the supply chain for biomethane. Purposive sampling was utilised to ensure that the 18 applications reflected the diversity of biomethane applications which were submitted after the reform announcements in December 2016, including those submitted before and after the principal reforms came into effect in May 2018. Interviews with applicants were conducted in January and February 2019, and with stakeholders in March and April 2019.

As outlined below, some of the questions addressed in the detailed applicant monitoring were also covered in the qualitative research which made it possible subsequently to extract the relevant information and partially amalgamate the two datasets. The methodology for this is explained in the section titled “Amalgamating data from the qualitative research and detailed applicant monitoring” below. Table 1 shows the topics covered in both the qualitative research and the detailed applicant monitoring and subsequently used in this amalgamation process.

## Detailed applicant monitoring – approach & methodology

Detailed applicant monitoring is carried out through the RHI accredited applicant survey. This survey covers 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.

The RHI accredited applicant survey is issued to all applicants that have been accredited to the scheme and no other selection criteria are applied. The biomethane synthesis report draws on three waves of data collection (Waves 25, 26 and 27), covering non-domestic biomethane applicants that applied to the scheme between 1st January 2015 and 28th February 2019.

In Wave 25 the biomethane and biogas survey was conducted over the telephone to deal with complexities surrounding applicants with multiple applications. In Wave 26 and Wave 27 the survey was updated to support complex and multiple applications and was moved to an online approach.

The full methodology and biogas / biomethane questionnaire that was issued to respondents is included in Annex B1 - RHI accredited applicant survey - technical. The biogas/biomethane survey uses a different questionnaire to the standard version issued to other RHI applicants as questions are asked about the wider supply chain and stakeholders. This is important as, unlike other RHI applicants, biomethane/biogas applicants are not necessarily generating heat for their own use but are often part of a waste disposal and fuel generation supply chain.

## Amalgamating data from the qualitative research and detailed applicant monitoring

The number of survey responses received from biomethane applicants in waves 25 to 27 (covering applications received January 2015 to end of Feb 2019) was 24, of these 23 provided responses to the questions which have been amalgamated with the qualitative responses.

Although this represents a good response rate for an online survey (23% of the 102 applicants who received the survey during this period) the small samples limit the inferences that can be drawn, particularly when comparing pre and post reform applicants.

To support the reliability of conclusions that could be drawn from the analysis a decision was taken to construct a mixed-methods dataset on some key topics based on data from the detailed applicant monitoring and qualitative research. The benefits of amalgamating data from the quantitative applicant monitoring surveys and the qualitative applicant interviews include:

- providing a streamlined narrative which minimises readers inappropriately relying on a single source which on its own may not be robust;
- allowing for removal of duplicate cases which participated in both data collection activities; and
- minimising non-response or mode effect biases which may be present in the individual datasets.

This analysis was possible because the qualitative interviews adopted a semi-structured approach, with specific probes included in the interview topic guides which mapped well onto the survey questions (see table 1). This meant that the mixed-methods dataset provided reasonably comprehensive data from the qualitative sample on some of the questions which were covered in the detailed applicant monitoring.

### Analysis process

Amalgamating the data involved the following process:

- Unweighted survey responses for those who participated in the survey were extracted from the survey data – this covered 23 responses
- Partial responses from the survey were included within the 23 responses mentioned in the above bullet<sup>1</sup> – the 23 responses therefore comprise 18 complete and 5 incomplete responses
- The coded data from the qualitative research were reviewed to identify where direct responses had been given to some of the key questions covered in the detailed applicant monitoring, e.g. on feedstock usage, source of finance etc.

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<sup>1</sup> Partial responses are not used in the main survey analysis as applicants who fail to reach the end of the survey are not deemed to have engaged fully enough to provide a reliable response. Where an applicant reaches the end of the survey but misses some questions, these are deemed to be a complete response.

- This process added 15 additional responses to some of the survey questions, once duplicates (i.e. five applicants took part in the qualitative interviews and quantitative applicant monitoring survey) had been removed.
- All of the responses collated through the steps above were used to construct data tables for those survey questions where the qualitative data could effectively be converted into the format used in the detailed applicant monitoring survey – see following section.

This approach was considered to be a pragmatic and reliable use of the data because both datasets are comprised of self-reported data from applicants. The use of the qualitative data in is also possible because none of the questions used in the analysis rely on any inference or interpretation of participant statements. Only direct statements from participants in the qualitative research have been used to code a response in line with the survey question.

Table 1 sets out the question wording used in the detailed applicant monitoring alongside the topics and probes used in the qualitative topic guide.

Caution should still be taken with this data as the precise wording of the question may have differed due to the qualitative approach being flexible and based on topic guides rather than fixed questions. All qualitative data was fully transcribed and coded allowing the analysis to refer directly to participant statements, further avoiding the need to infer a response from interview notes or summaries.

A robustness check was carried out using the duplicates to assess whether the survey and interview methods produced consistent answers. Of the five participants who took part in both methods, the responses matched exactly for four of them. The fourth showed a discrepancy only on the technology that would have been installed in the absence of the RHI. In the survey they reported that they would have installed the same technology while in the qualitative interview they reported that the RHI was critical to the installation<sup>2</sup>. This discrepancy highlights that the survey data may be understating the impact of the RHI compared to the interviews, but does support the assumption that there is overall a high degree of consistency between these methods.

**Table 1: Overlap between detailed applicant monitoring and qualitative workstreams**

Survey question in the detailed applicant monitoring	Topic addressed in the qualitative research
<p>What sources of finance have been obtained to install the RHT(s)?</p> <ul style="list-style-type: none"> <li>• Grant</li> <li>• External Private Equity</li> <li>• Bank loan</li> <li>• Asset Finance Package</li> </ul>	<p>Evidence was taken from direct participants responses to two questions.</p> <p>1. Can you describe the most significant elements of the business case for this particular biomethane installation, i.e. what factors does (or did) the business case for this installation most depend on? (Probes included 'Availability/cost of finance')</p>

<sup>2</sup> Following further probing in the original interview the applicant confirmed that the RHI was critical to the installation, so for this reason the response from the qualitative interview has been used in this analysis for this respondent

<ul style="list-style-type: none"> <li>• The organisation’s own finances, including balance sheet</li> <li>• Other [O]</li> <li>• Don’t know</li> <li>• Prefer not to say</li> </ul>	<p>Go through each element they identified, one-by-one, and explore in as much depth as possible the factors that influenced the respondents’ reasoning. (Probes included ‘if availability of finance was mentioned, ask them to explain this in more detail: was it the terms of the finance, the nature of the lender etc?)</p> <p>2. Explore which other organisations are involved, and how the relationships between them were formed</p> <p>Prompts and probes: Through this topic we need to build an understanding of the different organisations involved in different types of installations - landowners, feedstock providers, developers, financiers, owners of the different parts of the plant, digestate users etc - and how the relationships between them were formed:</p> <ul style="list-style-type: none"> <li>- at what stage of the business planning process were the different relationships formed?</li> <li>- who approached who, and did RHI play any role?</li> <li>- how were the approaches made? (e.g. is there an introduction service being run by consultants?)</li> </ul>
<p>Without the RHI, would you have proceeded with the same installation?</p> <ul style="list-style-type: none"> <li>• No</li> <li>• Yes, but slower</li> <li>• Yes, and in the same timescale</li> </ul>	<p>Spend some time now to explore [the RHI’s] significance:</p> <ul style="list-style-type: none"> <li>• Could the installation go ahead without it?</li> <li>• If so, how would it differ in the absence of RHI, e.g. in size, nature of feedstock?</li> <li>• If not, what would have happened instead, e.g. a different technology?</li> <li>• How sensitive was the business case to fluctuations in the tariff?</li> </ul>



	Explore the reasons for the timing of the RHI application
<p>Without the RHI what technology would have been installed?</p> <ul style="list-style-type: none"> <li>• The same as has been installed</li> <li>• Bio-methane injection</li> <li>• Biogas CHP plant</li> <li>• Biogas heat only</li> <li>• Combination of above</li> <li>• Gasification plant</li> <li>• Other renewable technology</li> <li>• Other non-renewable technology</li> <li>• Nothing</li> <li>• Don't know</li> </ul>	See cell above
<p>What course of action would you have taken if tariff guarantees had not been available? [Open text]</p> <p>Open text responses used in the amalgamation analysis</p>	<p>Explore the impact of the each of the RHI reforms on the biomethane installation. Go through each of the key biomethane-related reforms in turn and explore whether and in what way they influenced the biomethane installation, e.g. in terms of the timing of the application, size, feedstock, technology type etc.</p> <p>The topic guide included a probe which was specifically about the impact of the availability of tariff guarantees. The topic guide then led the interviewer to confirm the appropriate Context-Mechanism-Output configuration (CMO) which best characterised the role of the reformed RHI in the business case for the installation. These CMOs are explained in the qualitative working paper.</p>

## Reporting

It is not appropriate to refer to the findings in a quantitative way by using them as estimates for the entire population as they are drawn from two different sources, are unweighted and because the qualitative sampling was purposive rather than random. Referring to the results quantitatively would imply a more robust sampling and data collection approach than is justified.

The biomethane synthesis report presents these findings in a qualitative sense, relating to the sample of participants only. This approach acknowledges that these are true statements from applicants, without assuming they are representative of the population.

## Data tables

The data tables below present the evidence collected from the surveys and qualitative interviews that have been combined for analysis. These tables do not present population estimates and conclusions should not be extrapolated as such. The findings should be treated as if they were qualitative evidence, i.e. they provide evidence relating to the participating sample of applicants only.

**Table 2: Sources of finance for biomethane installations (number of applications)<sup>3</sup>**

	Internal finance	External private equity	Loan finance	Project debt finance	Mixed	No response	Total
<b>Post-reform</b>							
<i>Survey</i>	0	1	0	1	3	2	7
<i>Qualitative</i>	2	7	2	0	0	0	11
<b>Total</b>	2	8	2	1	3	2	18
<b>Pre-reform</b>							
<i>Survey</i>	4	5	1	0	4	0	14
<i>Qualitative</i>	4	1	1	0	0	0	6
<b>Total</b>	8	6	2	0	4	0	20

<sup>3</sup> The original questions in both survey and qualitative interview allowed for applicants to provide more than one source of finance. For the purposes of this analysis a 'mixed' category has been added. This differs from the survey data tables where responses are reported per category leading to responses summing to over 100%.

<b>Scheme total</b>							
<b>Total</b>	10	14	4	1	7	2	38

**Table 3: Self-reported outcomes in the absence of the RHI**

<b>Outcome</b>	<i>Survey</i>	<i>Qualitative</i>	<b>Total</b>
<b>Would have installed the same technology regardless</b>	4	0	4
<b>Would have installed a different RHT without the RHI</b>	10	5	15
<b>Would not have installed another heating system otherwise</b>	5	9	14
<b>Don't know</b>	0	3	3
<b>No response</b>	2	0	2
<b>Total</b>	21	17	38

**Table 4: Self-reported outcomes in the absence of the RHI, by technology**

<b>Technology</b>	<i>Survey</i>	<i>Qualitative</i>	<b>Total</b>
<b>Same technology</b>	4	0	4
<b>Biogas</b>	7	5	12
<b>Other renewable technology</b>	3	0	3
<b>Unclear</b>	0	3	3
<b>Nothing</b>	9	5	14
<b>No response</b>	2	0	2
<b>Total</b>	21	17	38

**Table 5: Self-reported outcomes in the absence of tariff guarantees (post-reform applications only)**

<b>Outcome</b>	<b>Survey</b>	<b>Qualitative</b>	<b>Total</b>
<b>Would have gone ahead anyway</b>	<i>0</i>	<i>2</i>	<b>2</b>
<b>No project</b>	<i>3</i>	<i>8</i>	<b>11</b>
<b>Unclear</b>	<i>1</i>	<i>1</i>	<b>2</b>
<b>No response</b>	<i>3</i>	<i>0</i>	<b>3</b>
<b>Total</b>	<i>7</i>	<i>11</i>	<b>18</b>

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