Department of Energy & Climate Change

Evaluation of the Renewable Heat Incentive

Interim report: the non-domestic scheme

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Terminology and definitions

Throughout this report we refer to the following types of RHI stakeholder.

- **Applicants**. Organisations which have taken up or tried to take up the RHI.
- **Multiple applicants.** Organisations which have made more than one application to the RHI.
- **Possible applicants.** Organisations included in qualitative interviews that had either considered installing renewable heating technologies but decided not to or that went ahead with their installation but decided against applying for the RHI.
- **Respondents.** Individuals that took part in the quantitative surveys conducted as part of this evaluation.
- **Participants.** Individuals that took part in the qualitative interviews conducted as part of this evaluation.

The following describes the main RHTs which have received support so far under the non-domestic RHI.

- **Solid biomass boilers** burn wood biomass (usually pellets or chips) to heat hot water boilers where are used to either heat buildings and provide hot water (potentially via local heat networks) or, in some cases, to provide process steam for manufacturing.
- **Ground source heat pumps** extract heat from pipes which are buried in the ground. This heat is absorbed into a fluid and then pumped into a building, usually for space heating, albeit in some cases potentially to provide hot water. The pumps are typically driven by electricity.
- **Solar thermal installations** use tubes or 'collectors' to capture heat from the sun to heat water which is used for hot water and/or space heating.
- **Biomethane** installations use anaerobic digestion (AD) of biogenic materials (for example, food wastes or maize) to produce biogas, which is refined into biomethane and subsequently injected into the natural gas grid. Combined with natural gas, the biomethane can then be used for heating applications in homes and businesses.

The following technologies are also supported by the RHI, but uptake so far has been limited (for Air-source heat pumps, this could be largely due to the technology only becoming eligible for support from the end of May 2014 alongside other new or increased tariffs):

- **Biogas** installations use AD of biogenic materials to produce biogas, which is used to fuel a gas engine. This produces heat (usually along with electricity), which might be used for space heating, hot water or industrial 'drying' processes;

- **Water-source heat pumps (WSHPs)** extract heat from pipes which are laid under water. This heat is absorbed into a fluid and then pumped into a building, usually for space heating, albeit in some cases potentially to provide hot water. The pumps are typically driven by electricity.
- **Air-source heat pumps (ASHPs)** extract heat from the air.[1] This heat is absorbed into a fluid and then pumped into a building, usually for space heating, albeit in some cases potentially to provide hot water. The pumps are typically driven by electricity.
- **Deep geothermal installations** draw heat from hot water aquifers at depths where temperatures are considerably hotter than the surface. This water can be extracted and used to provide space heating and hot water for buildings (usually via local heat networks); and
- **Energy from waste (EfW)** burn waste (typically from households and businesses) to heat hot water boilers where are used to either heat buildings and provide hot water (potentially via local heat networks) or, in some cases, to provide process steam for manufacturing.

[1] We use the term air source heat pumps in this report to refer to air-to-water heat pumps, i.e. those that use hot water as the vehicle for heat provision. It should be noted that air-to-air heat pumps, which use air as the heat carrier, are not currently supported by the RHI

Executive summary

This report summarises interim findings from an independent evaluation of the Renewable Heat Incentive (RHI). The evaluation was commissioned by the Department of Energy and Climate Change (DECC) and this report focuses on findings related to the non-domestic scheme from research being undertaken by NatCen Social Research, Eunomia Research and Consulting and Frontier Economics (the evaluation consortium).

Background and Context

Almost half of energy consumed in the UK is used to provide heat, 43 per cent of which is used in the non-domestic sector. Reducing carbon emissions from non-domestic heat is therefore an important part of meeting UK greenhouse gas reduction targets.

Renewable heat can be generated from a diverse range of technologies including biomass boilers, heat pumps and solar thermal and offers an alternative to combusting fossil fuels, which emits greenhouse gases. At present the markets for these technologies are relatively small and generally have higher lifetime costs than conventional alternatives such as oil and gas boilers. Therefore support is required to stimulate increased uptake, overcome barriers and develop the supply chain.

The non-domestic RHI was launched in November 2011 (with installations of eligible renewable heat technologies (RHTs) since July 2009 qualifying for support). The Renewable Heat Incentive (RHI) scheme aims to[2]:

- **incentivise the roll out of renewable heating technologies to contribute to the UK's 2020 renewable energy target**;
- **deliver significant reductions in the carbon emissions resulting from heating**; and
- **prepare for mass rollout of renewable heating technologies beyond 2020** by building sustainable supply chains, improving performance, reducing costs and increasing awareness of these technologies.

Under the non-domestic RHI, organisations with accredited installations receive a payment for each metered unit (kWh) of heat produced for 20 years following accreditation of the installation.

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[2] The full objectives for the non-domestic RHI are set out in DECC (2013) *Renewable Heat Incentive: expanding the non-domestic scheme – Impact Assessment.* Available at: https://www.gov.uk/government/consultations/renewable-heat-incentive-expanding-the-non-domestic-scheme

In addition, to the non-domestic RHI, the domestic RHI opened on 9th April 2014 to people who install renewable heating technologies in their homes.

Research objectives and approach

This report focusses entirely on the **non-domestic RHI scheme**. The aim of this process evaluation is to understand the administration, delivery and performance of the RHI and explore its effect on the renewable heat supply chain.

The outputs from the evaluation will help DECC to understand and assess how the non-domestic RHI is delivering relative to its objectives and support development of the scheme. This evaluation also helps ensure that DECC is conforming to principles of accountability, transparency and openness to scrutiny in policy-making.

To achieve these objectives a series of research projects were designed and delivered by the contractors. These included surveys and interviews with non-domestic RHI applicants, possible applicants, the wider non-domestic population and the investment community.

Uptake of the Non-domestic RHI

As of 31st March 2014, 5,235 full applications for the non-domestic RHI had been made. Of these 3,769 had been accredited by the Office of Gas and Electricity Markets (Ofgem), 1,372 were being considered and 94 rejected or withdrawn.

Notably, over 90 per cent of installations so far have been biomass boilers. This is a higher proportion than was expected when the scheme was launched[3]. **Just over 900 GWh of renewable heat has been generated under the scheme, again with the vast majority coming from biomass**. Where this report presents findings relating to applicants, therefore, these reflect a largely biomass population.

Until now, applicants[4] to the RHI can be characterised in the following ways:

- **they are more likely to be located off gas grid**. Almost three quarters of RHI applicants do not appear to have a connection to the gas grid, compared to less than a quarter in the general population;
- **they are mainly from the commercial and leisure sector (56 per cent) and agriculture (24 per cent)**. Although agricultural organisations comprise five per cent of the wider business population, they currently are responsible for 24 per cent of non-domestic RHI applications. A substantial number of applications (56 per cent) are

[3] See, for example, DECC (2011). *RHI Impact Assessment*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48241/3775-renewable-heat-incentive-impact-assessment-dec-20.pdf

[4] Organisations which have taken up or tried to take up the RHI.

from the commercial and leisure sectors although, this is broadly in line with their share of the general population (66 per cent); and

- **they are more likely to be based in more rural locations** (the South West and Scotland).

The current deployment of Renewable Heat Technologies under the RHI therefore is more likely to be rural and off-gas, where the financial case for renewable heat technologies may be easier to make. Agricultural organisations, who are also likely to fit into these categories, have seen relatively high take-up.

Applicants' experiences of the non-domestic RHI

The applicant experience of the non-domestic RHI scheme involves a number of stages from development and submission of an application to receipt of tariff payments. In general, applicants have been positive about many aspects of the RHI. **The RHI payment and metering processes appear to be working well at present and applicants are satisfied with the requirements these aspects involve**. Around three quarters of applicants were "very" or "fairly" satisfied with metering. One in ten applicants (who are in theory eligible for payment) have experienced problems receiving payments.

Our findings suggest that the application process is the part of the RHI customer journey with the most room for improvement. It should be taken into consideration, however, that what applicants perceive as a problem may stem from the inherent complexity of the scheme design.

Organisations want to see more streamlining, clarity and consistency in the RHI application process where possible. While a third (34%) of applicants reported that the application process took four full-time equivalent days or less to complete, one-fifth (22%) of applicants reported that the application process took more than 15 days. Qualitative interviews with possible applicants also identified a perception that the application process is lengthy.

Just over half (54%) of applicants also reported experiencing problems completing their applications, particularly those applying for ground source heat pumps (GSHPs) or solar thermal. Those who experienced problems mostly reported a lack of clarity over the information they needed to provide and overly complex guidance (from Ofgem). This was a particular issue for GSHPs and solar thermal applicants, who experienced problems identifying and providing the right information.

The most common reason cited for applications being returned by Ofgem was inaccuracies or gaps in the details provided about the installation. This suggests there may be potential for improvements in simplifying the requirements for information provision or providing clearer guidance for applicants.

There are a number of multiple applicants to the RHI. The sample of applicants included in the qualitative interviews with multiple applicants reported very particular concerns with the RHI application process. These include the need to

provide the same information separately for each application and perceived inconsistency in decisions across applications (respondents reported application forms for what they saw as largely identical installations being approved earlier in the scheme and later rejected). There is the potential to provide a more effective, consistent and streamlined service for multiple applicants in the future.

Investing in RHTs

Awareness of RHTs

At present, **awareness of RHTs among the wider non-domestic population is high with 90 per cent of organisations having heard of at least one type of RHT**. Technologies with the highest take-up (biomass boilers, ground-source heat pumps and solar thermal) are the most well-known.

Seven per cent of organisations reported that they know “a lot” about RHTs with 51 per cent saying they know “a little”. Awareness of RHTs is highest in the industrial sector and amongst organisations that monitor their energy consumption regularly.

Awareness of the RHI

While awareness of RHTs is high**, awareness and understanding of the RHI amongst the wider non-domestic population is low with 79 per cent unaware of the scheme** prior to being surveyed. This suggests the RHI is not yet playing a major role in promoting wider awareness of RHTs

Awareness was higher among industrial organisations, small-scale Feed-in Tariff (FiT) claimants and those who spend a greater proportion of turnover on heating.

Qualitative interviews with possible applicants showed some misunderstandings existed around the attributes of RHI (e.g. how it differed from the small-scale FiT and whether it was a capital grant) and the eligibility criteria. This implies some organisations which could benefit from the RHI may not being doing so because of misconceptions.

Motivations, barriers and financing of RHTs

Amongst applicants, **motivations to invest in RHTs are largely driven by the financial return from the RHI tariff**. The environment and using ‘renewable’ energy sources is also important to a majority of organisations in their choice of technology, particularly for large and public sector organisations. The main barriers to investment for organisations are reported as a lack of confidence in the reliability of RHTs, the length of payback and uncertainty over the level of payback.

For the above reasons, the financial incentive offered by the RHI matters and there is clear evidence that a large proportion of installations would not have happened without the RHI.

More than three-quarters of RHI applicants financed their installations themselves and this group does not appear to have been constrained by access to finance. There appear to remain issues amongst those who did not self-finance

and possible applicants, however, relating to securing external finance to invest in RHI-supported installations (e.g. high transaction costs associated with small projects, high risk around heat off-take for large-scale CHP projects and uncertainty around future RHI tariffs). Non-applicants reported financing and cost as amongst the most significant barriers to installation of RHTs. These are both actual and perceived barriers - where in the latter case the perception of high cost deters further investigation into the technology.

Understanding of, and confidence in RHTs was mixed. Although awareness of RHTs is high, it appears that limited understanding of the technologies and a related lack of confidence in their performance may be a barrier to some organisations.

- 51 per cent agreed with the statement that RHTs are “cheap to run”
- 52 per cent were unsure whether RHTs would fulfil their heating requirements better than their current system; and
- 58 per cent were unsure whether RHTs were more reliable than conventional heating systems.

With the majority of current installations being self-financed and a lack of evidence of external financing playing a significant role at present, finance could become a barrier to growth of RHT take-up. Amongst the investor community, there is a general enthusiasm to invest in larger projects, but this is qualified by their frustration at a range of perceived barriers, including a lack of clarity over eligibility rules for the use of VCT and EIS funds and the viability of larger combined heat and power (CHP) projects. The asset finance and corporate lending sectors stated that their focus continues to be on biomass heating and there is relatively little understanding of, or enthusiasm (largely due to perceived longer pay-back periods) to invest in, other RHTs.

Installing and operating RHTs

The ongoing successful installation and operation of RHTs supported by the RHI is an important facilitator for take-up of the scheme. It helps improve confidence in the technologies and provides assurance that the supply chain is developing effectively. This is important in preparing for mass roll-out of RHTs in the 2020s – one of the main objectives of the RHI scheme.

The overwhelming majority of RHI applicants are satisfied with their RHT, with 90 per cent reporting that they are either “very” or “fairly” satisfied. Applicants for solar thermal report lower satisfaction than average with 65 per cent “very” or “fairly” satisfied. This is likely to be a reflection of lower heat output relative to expectations.

Applicants are also mostly satisfied with the installation process, with just under two thirds finding it “fairly” or “very” easy. Over half, however, did report at least one problem with their RHT installation with delays and unexpected cost being the most common issues.

In operating their RHTs, the vast majority of survey respondents to the *applicant survey* reported that their system was reliable. Organisations were also broadly satisfied with the customer service they had received once their RHT was operational.

How the non-domestic RHI is meeting its objectives and future research

The evidence so far suggests that:

- **the RHI is stimulating investments in RHTs**;
- **experiences with the installation and operation of RHTs have been positive**; and
- although RHTs are being installed in a wide range of sectors, the relatively low prevalence of non-biomass RHTs, larger systems, and the lack of non-self-financed installations shows that **areas of the supply chain still have room to develop**.

Further evaluation research is planned with the renewable heat supply chain and domestic and non-domestic organisations that will give DECC further insights into the performance of the RHI, its effect on non-domestic organisations and influence on the development of the supply chain.

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