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Non-Domestic Renewable Heat Incentive

www.ofgem.gov.uk/ndrhi

31 March 2021

Easy guide to Heat pumps

Background

Ground source, water source and air source heat pumps are eligible for Non-Domestic Renewable Heat Incentive (NDRHI) support.

The NDRHI scheme will be closed to all new applications from midnight at the end of 31 March 2021. Eligible plants seeking accreditation must have been commissioned and submitted a properly made application for accreditation by midnight at the end of 31 March 2021. There are some circumstances under which an application for accreditation or registration can be made post- scheme closure.

The RHI Regulations set out the efficiency requirements for heat pumps that must be demonstrated at accreditation stage. There are also specific metering requirements for heat pumps. This document will explain these efficiency and metering requirements. Please see our RHI Guidance Volume 1 for other eligibility requirements.

This guide is only intended as a general introduction to the scheme. For more detailed information on whether you are eligible, and how to apply to the scheme, please refer to our main guidance, as well as the Easy Guides at the end of this document. This document will explain these efficiency and metering requirements. Please see our RHI Guidance Volume 1 for other eligibility requirements.

From 1 April 2021, a mechanism for the modification of capacity will be introduced into the NDRHI for Ground Source Heat pump that will be part of a Shared Ground Loop Systems (SGLs) and SGLs that are providing space and water heating to multiple premise.If you have a ground or water source heat pump utilising a shared ground loop and have submitted (or plan to submit) an application to the RHI on or after 22 May 2018, please see our Easy Guide to Shared Ground Loops for more information.

Eligibility

Applications made on or after 28 May 2014 and where the plant was first commissioned on or after 4 December 2013

Air to water source heat pumps are eligible, apart from the following exceptions:

- those that are designed to provide cooling
- those that are designed to use heat that has been expelled from a building or from a process which generates heat

The following heat sources may be used by ground- source and water-source heat pumps in addition to using naturally occurring energy:

- solar energy gathered by any means (other than by a solar collector that is an accredited RHI installation) and is stored in the ground in the form of heat
- heat from space cooling, or process cooling heat from processes other than heat generation

Modified capacity

From the 1 April 2021, participants who have an accredited SGL or a ground source heat pump will be able to modify the capacity of their installation through the addition of one or more ground source heat pumps. Any such modification is permissible only if the additional ground source heat pumps are to be commissioned as part of a SGL and will meet the eligibility requirements of SGLs.

It is important to note that the regulations specify that heat pumps added via the modified capacity route must only provide space and/or water heating only and not process heating. In cases where an existing heat pump provides process heating, it will be the responsibility of the participant to establish metering arrangements that will enable Ofgem to quantify the heat produced by the additional heat pump(s) that has been delivered to any process heating. This is in order to accurately calculate RHI payments.

Participants who wish to modify the capacity of their installation must submit a plan to modify capacity to Ofgem on or before 31st March 2023. For more information on modified capacity and the information required as part of the submission of a plan to modify capacity, please see Guidance Volume 2.

Coefficient of Performance and Seasonal Performance Factor for heat pumps

Coefficient of Performance (COP)

COP is defined in the Regulations as "the ratio of the amount of heating or cooling in kilowatts provided by a heat pump to the kilowatts of power consumed by the heat pump". COP is determined by laboratory testing at defined source and heat flow temperatures

Seasonal Performance Factor (SPF)

SPF is defined in the Regulations as "in relation to an air source heat pump or a ground source heat pump, the ratio of its heat output to electricity input expressed as an average over a year". A heat pump with a higher SPF will be more efficient and will deliver more heat for each unit of electricity used.

Table 1 Minimum requirements

Requirement		Possible forms of evidence
COP	At least 2.9	COP confirmed by manufacturer's datasheet at rated conditions.
Design SPF	At least 2.5	For installations of 45 kW or less, section 3b of the Installer Declaration should be completed by your installer. For installations greater than 45 kW, section 3a of the Installer Declaration should be completed by your installer. You will need to obtain the supporting calculations from your installer and retain them as they may be checked at accreditation stage or at audit.
SPF	No minimum requirement	Electricity meter readings to be provided on a quarterly basis.

What is the difference between 'design SPF' and 'SPF'?

Design SPF

The design SPF will be calculated by the installer or other appropriately qualified professional. It is the expected heat pump efficiency, considering site specific factors.

SPF

The actual SPF is based on quarterly electrical input and heat output measurements. All ground source, water source and air to water heat pump installations submitting applications from 28 May 2014 will need to measure the electrical input to the heat pump.

Electricity meter readings will need to be provided every quarter as part of your periodic data submission. You will not be required to carry out the SPF calculations yourself, this will be calculated automatically. You will not need to install any additional heat meters as part of this requirement.

Will the SPF measurements affect payments?

The design SPF is an eligibility requirement for accreditation and must be a minimum of 2.5. Ongoing measurement of SPF is for monitoring purposes only and will not affect RHI payments.

How do I meter my electrical input?

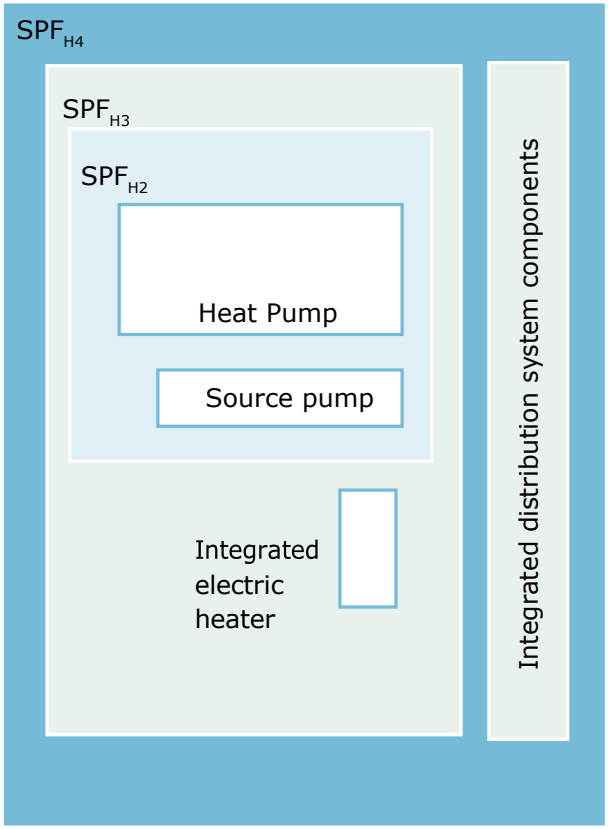
Where the heat pump controller has the capability to log the electrical input this may be used. Alternatively, appropriate electricity meter(s) may be installed. Electricity meters should be installed according to best industry practice. Your installer will be able to assist you with selecting appropriate meters.

If the heat pump is capable of cooling, the measured electrical input should be for the heating function only, if this is not overly burdensome.

Each quarter, the kWh of electricity input into? the equipment within the boundary will need to be recorded.

Measurement approach

We will need to know which components are included in your measurement of electricity consumption and heat output. To do this we will ask you to tell us which of these three common system boundaries reflect your heat pump arrangements.



SPF H2

- heat pump unit
- equipment required to make use of the source energy, e.g. pump or fan

SPF H3

- heat pump unit
- equipment required to make use of the source energy, e.g. pump or fan
- integrated electric heater

SPF H4

- heat pump unit
- equipment required to make use of the source energy, e.g. pump or fan
- integrated electric heater (if present)
- internal distribution system components such as circulation pump and motorised valves.

Heat pumps capable of cooling

Is my heat pump eligible?

Ground source and water source heat pumps that are capable of cooling are eligible technologies, though only heat generated is eligible for RHI support.

Air to water heat pumps that are capable of cooling are not an eligible technology.

What capacity should I enter on the RHI application form?

For heat pumps capable of cooling, the capacity submitted must be the 'design heat load'. This is defined in the Regulations as "in relation to ground source heat pumps that are capable of heating and cooling, the heat flow required to achieve the planned heating requirements for that plant".

In other words, the capacity of the heat pump associated to the heating function, and not including the cooling function.

Your installer should calculate your design heat load and enter this into section 2 of the Installer Declaration. They should also provide you with the supporting calculations which you must retain, as this may be checked at accreditation stage or at audit.

What do I need to prove?

You need to ensure that your metering arrangement will not be affected by the cooling function. You should write a statement at question HK120 of the RHI application form to explain how you will ensure the meters are not affected by the cooling function. You must then demonstrate this on your schematic by clearly distinguishing between the heating and the cooling circuits.

Integrated immersion heaters

Introduction

For the purpose of the Non-Domestic RHI, the term 'integrated immersion heater' refers to immersion heaters which are incorporated within the heat pump unit itself.

This section explains the additional requirements for RHI applicants resulting from the use of heat pumps with integrated immersion heaters. Text in bold refers to wording which will appear on the 'Renewable Heat Incentive Register'.

Heat pumps with integrated immersion heaters are not excluded from the RHI. However, the primary legislation which underpins the scheme[1] only allows support for the "renewable generation of heat". Therefore, the heat generated by the integrated immersion heater must be appropriately accounted for. This heat will not be eligible for RHI payments.

Due to the technically challenging nature of measuring this heat by means of a heat meter, alternative means of measuring the heat from the integrated immersion are considered acceptable. These are detailed below.

How can I measure heat produced by an integrated immersion heater?

1. Heat Pump Controller:

Where the heat pump control unit has the capability to log the number of hours the immersion heater is used in a given time period, the heat produced can be calculated by recording this 'total hours of immersion use' figure for the quarterly submission period[4] and multiplying by the rating of the immersion in kWe[5]

to represent the heat produced from the integrated immersion heater in kilowatt-hours (kWh).

Where a unit has more than one integrated immersion, with different ratings, the control unit would have to be able to log the number of hours each different immersion heater has been utilised in order to use this approach[2]. If this is not the case and you wish to use this approach please contact the RHI operational team.

2. CT Monitoring Coil

A 'clip on' current transformer (CT) monitoring coil connected to a kWh meter can be applied to the internal wiring for the immersion heater(s). This should be fitted by a qualified electrician or heat pump engineer, to ensure this is undertaken safely and is located correctly.

The kWh figure measured by either of these methods will be used to represent the heat output from the integrated immersion[3] for the quarterly periodic data submission period. You are welcome to propose an alternative methodology and we will consider these on a case by case basis. If you wish to propose an alternative approach, please contact us before submitting your application for accreditation.

N.B. CT monitoring coils are not required to be of any given standard or brand. Our only requirement is that they must be able to provide a kWh reading for the electrical input to the immersion heater(s).

[1] The Energy Act 2008, section 100.

[2] Otherwise in this situation we may require you to make a conservative assumption that the maximum-rated immersion heater was in use at all times.

[3] Since 100% of the electrical energy provided to the immersion is assumed to be converted to heat energy.

What to do for periodic data submissions

Each quarter the kWhth of heat provided by the integrated immersion heater will need to be calculated, in line with the approach outlined in your application, and submitted as part of your periodic data submission. This is made via the 'Renewable Heat Incentive Register'.

In completing this, take account of the following instructions:

- The measured figure for heat produced from the integrated immersion heater should be provided within the 'Back-up heaters integral to the heat pump system' field.
- Subtract this figure from the metered heat from the heat pump installation for the quarterly periodic data submission period.
- Provide the result of this subtraction to the 'Heat generated by the installation' field. For multiple[4] installations where other plant supplying heat to the heating system have been

metered, this subtraction should not be reflected in the 'Heat generated by all the plants supplying heat to the heating system' field.

Upon accreditation, any specific requirements regarding the submission of periodic data will be communicated by Ofgem within your conditions of accreditation. Once you become accredited, or registered, you will have ongoing obligations which you will be required to comply with. Failure to comply with your ongoing obligations will result in compliance action which may impact your RHI payments or your accreditation. For further information on ongoing obligations, please refer to our Easy Guide to Complaince when accredited.

[4]Please note that as of 1st April 2021, the 'simple' and 'complex' classifications were removed from the scheme. As such, any installation that was previously classified as a 'simple' will be considered 'standard' as of 1st April 2021 and any system classified as 'complex' will be considered 'multiple' as of 1st April 2021.

Easy guide series

Easy Guide to the Non-Domestic RHI
Easy Guide to Eligibility
Easy Guide to Applying
Easy Guide to Metering Requirements
Easy Guide to Compliance
Easy Guide to Periodic Data Submissions
Easy Guide to Sustainability
Easy Guide to Heat Pumps
Guide to Tariff Guarantees

This Easy Guide is applicable to applicants and participants on the GB Non-Domestic scheme. If you're an applicant or participant on the Northern Ireland Non-Domestic scheme then please refer to the Northern Ireland Renewable Heat Incentive.

Contact us

If you have a query or need help please contact us:

By telephone: 0300 003 2289 By email: RHI.Enquiry@ofgem.gov.uk

The Non-Domestic RHI enquiry line is open Monday to Friday. Please see our Contact us page for timings Note: calls may be recorded. Please have your RHI application reference number to hand if you are calling or put it in the subject line of your email.