

# FUNDAMENTALS

**Series 11**

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## MODULE 1: RENEWABLE HEAT INCENTIVE

# Making the Renewable Heat Incentive work for you

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**A**s a member of the European Union, the UK is obliged to meet 15 percent of its energy needs from renewable sources by 2020<sup>1</sup>. As a significant proportion of the UK's energy use is consumed as heat in buildings<sup>2</sup> it is important to consider heat when devising a national renewable energy supply strategy. Currently, the government is committed to sourcing 12 percent of heat from renewable sources by 2020. The vast majority of heat is supplied by fossil fuels – with 80 percent being provided by natural gas alone in the UK.

The renewable heat incentive (RHI) forms part of the UK Government's renewable energy strategy and is the core component of its heat strategy. It is a scheme for incentivising the installation and operation of renewable energy technologies through payments for the heat supplied by them. The incentive is paid quarterly to the owner of the installation over a period of up to twenty years. The amount paid is dependent upon the type of technology and its scale. The scheme is a world first designed to increase the uptake of renewable heat technologies and reduce the UK's carbon emissions.

### Slipping timetable

The RHI scheme was launched in November 2011 for non-domestic buildings and was to be introduced in the domestic sector in October 2012 to compliment the Green Deal<sup>3</sup>, but the timetable has slipped. The government plans to announce final details regarding the domestic scheme this summer, with the intention of the first payments for



domestic installations being made in the spring of 2014.

The existing, non-domestic RHI provides payments to organisations that have eligible renewable energy heating technologies installed by approved installers. The payments are made in the form of a payment per kWhth of heat produced. For larger installations the heat output must be metered; for smaller ones where it is impracticable or uneconomic to meter the heat output, there is some flexibility over how the heat produced may be quantified and the incentive payment made.

The RHI is analogous to the now well-established feed in tariff (FIT). Whereas the FIT provides a payment to building operators for electricity generated by renewable sources, the RHI provides a payment for the generation of heat. Both schemes are restricted to specific technologies and must be installed by accredited

installers. The FIT is only applicable to installations that are connected to the national electricity distribution system. There is no requirement for RHI installations to be connected to the national gas grid, district heating systems or other means of exporting heat – it applies equally to standalone

space heating systems that just serve the buildings they are installed in as to those that are integrated with other buildings or estates.

### Supported technologies

The eligible technologies supported by the scheme are:

- solid biomass;
- heat pumps – ground and water source, but not air source heat pumps;
- solar thermal (up to 200 kWth);
- geothermal;
- municipal solid waste (MSW);
- biogas combustion (up to 200 kWth);
- biomethane injection.

This article focuses upon the technologies most likely to be installed in commercial buildings by their owners, namely biomass, heat pumps and solar thermal.

The RHI was developed by the Department of Energy and Climate Change (DECC), which has responsibility for the overarching policy framework; it sets the payment tariffs for the various technologies and will review these as the scheme is taken up by the market and expands into the domestic sector.

RHI payments make sound and eligible renewable heating projects more financially attractive and have the potential to lead to significantly more projects going ahead than



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## MODULE 1: RENEWABLE HEAT INCENTIVE

would happen without it. As with many renewable energy projects, the best financial case is likely to apply to the construction phase of new buildings or the replacement of heating equipment that has reached the end of its life. However, it is also worthwhile reviewing the financial viability of installing renewable heating systems under other circumstances, particularly after other energy efficiency measures have been exhausted.

The RHI may be formally applied for only after an eligible system has been installed – providing it was installed after 14th July 2009. There are some exceptions to this, e.g. for large, complex systems for which preliminary applications and/or early applications can be made. However, for all scales of systems, formal applications will fail if they do not meet the scheme's requirements and any preliminary application conditions. It is therefore important to take a methodical, planned approach to ensuring that the scheme's requirements are met before proceeding. After identifying the need for an eligible heating system, financial viability should be checked, using published RHI payment values, along with technology supplier and installer quotations and professional advice. An MCS-certified installer must be used for the design and installation works.

The RHI scheme is operated by the Office of Gas and Electricity Markets (Ofgem) and hence once the system has been installed a formal application can be made to Ofgem, including the following steps:

- create an account on Ofgem's website, providing information on the proposed installation;
- send Ofgem the evidence required to support the application;
- receive Ofgem's accreditation or rejection, plus feedback;
- proceed with the project – if accredited;
- receive quarterly RHI payments; and
- submit annual reports to Ofgem confirming eligibility for continuing RHI payments

All communication regarding the scheme, including application, submission of evidence and reports is done via the account created

on the RHI registry on Ofgem's website. The type of evidence that is required at the application stage is fairly onerous and includes the technical specifications of primary heat sources, such as boilers, heat pumps etc., schematics, planning consents, invoices and commissioning documents. Ofgem's functions also include the provision of guidance for prospective participants and documents, such as Renewable Heat Incentive Guidance Volumes One and Two are available on its website.

To be eligible for the RHI scheme, the system must comprise of one of the eligible renewable energy technologies listed in the introduction to this article, supplying a non-domestic application in England, Wales or Scotland. Northern Ireland, Isle of Man and the Channel Islands are excluded. The system must have been new at the time of its installation, delivering its heat via steam or hot water for space heating and/or domestic hot water, or for carrying out a process where the heat is used within a building. There must be no public grant or subsidy for the purchase of the equipment and both the equipment and its installer must have Microgeneration Certification Scheme (MCS) certification – or equivalent.

There are requirements on how the heat is used – namely that it must be used within a building, whether it is for space or process heating. The definition of a building for the purposes of the regulations is 'any permanent or long-lasting building or structure of whatever kind and whether fixed or moveable which, except for doors and windows, is

wholly enclosed on all sides with a roof or ceiling and walls'.

There are also some technology-specific requirements that refine the criteria laid out regarding eligible renewable energy sources and their capacities: -

### Biomass Boilers

Solid biomass heat sources are eligible for RHI, providing the biomass fuel falls within the definition of 'material, other than fossil fuel or peat, which is, or is derived directly or indirectly from, plant matter, animal matter, fungi or algae'. Examples of fuels that meet this definition include:

- wood (logs, wood chip & pellets);
- straw & agricultural residues;
- food waste;
- paper/pulp residues from the paper manufacturing process;
- biomass residues from the food processing industry;
- sewage sludge.

Liquid biomass is not eligible.

Biogas is eligible and is covered under a separate paragraph.

Fossil fuelled heat is not supported by the RHI. However, installations that include both fossil fuelled and biomass fuelled equipment are eligible, providing additional requirements are met. For example, an installation that includes a biomass and coal fired boiler supplying a heating system may need to be metered separately, such that the heat provided by the coal fired boiler is separately quantified.

District heating receives no specific incentive or subsidy, or uplift under the RHI. The eligibility of a heat source is not affected by whether it supplies a district heating system or a single,

non-domestic building.

### Biogas combustion for heat

Biogas is defined as 'gas produced by the anaerobic or thermal conversion of biomass'. It must apply anaerobic digestion, gasification or pyrolysis of solid biomass – although gas from landfill sites is not compliant. There is a capacity limit on biogas systems of up to 200 kWth.

There is no MCS certification requirement for biogas plants.

### Heat Pumps

Ground and water source heat pumps are eligible, providing they achieve a coefficient of performance (COP) of at least 2.9. Both electrically driven and gas-driven heat pumps can be used, although the COP requirements differ. In either case, there are strict requirements on the information and evidence to be supplied to prove that the COP meets the requirements.

The heat that is extracted by the ground or water source heat pump must come from a naturally occurring source – typically the sun. Where waste heat from a process, cooling cycle or other source that is not naturally occurring forms part of a heat pump installation, it will not attract the RHI – only that fraction of the total extracted heat that is naturally occurring within the ground or surface water would be eligible. Ofgem is consulting on how this fraction could be quantified.

A ground or water source heat pump installation with an integral electric immersion heater would be eligible for the RHI, although any heat produced by the immersion heater would not be eligible. An applicant

### RHI Payment Table

| Renewable Heat Source Technology      |        | Heat Output Capacity (kW <sub>th</sub> ) | RHI Payment (p/kWh) |        |
|---------------------------------------|--------|------------------------------------------|---------------------|--------|
|                                       |        |                                          | Tier 1              | Tier 2 |
| Solid Biomass (including biomass CHP) | Small  | Less than 200                            | 8.3                 | 2.1    |
|                                       | Medium | 200-999                                  | 5.1                 | 2.1    |
|                                       | Large  | Over 1,000                               | 1.0                 |        |
| Heat Pumps (Ground & Water Source)*   | Small  | Less than 100                            | 4.7                 |        |
|                                       | Large  | Over 100                                 | 3.4                 |        |
| Solar Thermal                         |        | Less than 200                            | 8.9                 |        |
| Biogas combustion                     |        | Less than 200                            | 7.1                 |        |

\*Air source heat pumps are not eligible for the non-domestic RHI

## MODULE 1: RENEWABLE HEAT INCENTIVE

would be expected to quantify the contribution by the immersion heater and deduct it from the payment claim. Ideally the immersion heater's electricity consumption would be separately metered, although it is acceptable to infer it using the run hours log and multiplying it by the immersion heater's rating.

### Solar Thermal

Unlike biomass and heat pumps, there is an output capacity limit on solar thermal collectors' RHI eligibility, set at 200 kWth. Only collectors comprising liquid filled flat plates or evacuated tubes are eligible. Passive systems such as solar walls, trough and parabolic collectors are excluded. Whilst hybrid photovoltaic-thermal (PVT) systems are eligible, only the thermal element attracts the RHI.

Compliant solar thermal collectors used to pre-heat the water supplied to a gas-fired water heater are eligible. Only the renewable heat supply attracts the RHI and both the renewable and fossil fuel systems must be metered.

### Combined heat and power

The heat output from a combined heat and power system that uses a renewable energy source rather than a fossil fuel source is eligible. The heat used to generate electricity is not eligible and must be separately quantified. Fossil fuel fired CHP is not eligible. Whereas micro-CHP is eligible under FIT, it is not under the RHI.

The RHI and FIT schemes differ from the majority of previous UK government schemes to stimulate investment in renewable energy technologies in that they provide on-going support through revenue payments, rather than a front-loaded grant or loan to support the initial investment. Although the scheme was launched in November 2011 for non-domestic buildings, companies that installed systems before then – back to July 2009 – can still claim quarterly RHI payments.

The level of payment is dependent upon the type and scale of technology and the distribution of payments between technologies is intended by government to support its priorities to stimulate the installation of these technologies.



Tiers 1 and 2 apply to small and medium scale biomass. Tier 1 is the higher payment made for the first 1,314 hours of operation each year. Tier 2 is the lower payment made for all subsequent running hours each year. The two tier arrangement results in lower average p/kWh payments to continuously operated heating systems, allowing a higher RHI payment for intermittently operated schemes than would otherwise be affordable.

The rate payable for ground source heat pumps has been under review since 21st January 2013. The government anticipates that its review will lead to an increase in the level paid. All installations taking place after 21st January will benefit from the anticipated higher rate. The Ground Source Heat Pump Association (GSHPA) suggests the value should rise from 4.7 p/kWh (Tier 1) to 9.4 p/kWh.

The heat output capacities apply to total systems as defined in the RHI application, rather than individual items of equipment. Where there are multiple items of heating plant, care must be taken to determine whether they can be covered by a single RHI application, or require separate applications. As an example, multiple biomass boilers supplying the same heating system would come under a

single application and their outputs must be aggregated to determine RHI payment values. However, if the boilers use different fuels, each will require a separate RHI application. Conversely, if an organisation owns two biomass boilers serving two separate heating systems, each will require its own RHI application.

Heat supplied by an RHI-compliant system must be metered with Class 2 accuracy requirements.

Ofgem published a report on the performance of the scheme in October 2012, showing that take up has been relatively light at just 348 accredited schemes at that time, 99 per cent of which were biomass. Take up of GSHPs has been low



and DECC has acknowledged this through its review of the level of payment that should be made for heat pumps. Air source heat pumps will be included in the scheme in the future, a development that could see a significant increase in take up of the scheme.

### References

1. The UK's obligation to source 15 per cent of energy from renewable sources by 2020 is a requirement of the European Union's Renewable Energy Directive 2009.

2. Heat is the single biggest use of energy in the UK – greater than that for transport or the generation of electricity. 80 per cent of heat is supplied by natural gas – ref The Future of Heating: A strategic framework for low carbon heat in the UK, Department of Energy and Climate Change, March 2012.

3. The Green Deal is a Government backed scheme to promote investment in energy efficiency and renewable energy technologies in buildings. It has been launched in the opposite order to the RHI – i.e. domestic sector first, with non-domestic buildings to follow by the spring of 2014.

### Further information

- DECC's online guidance: [www.gov.uk/renewableheatincentive](http://www.gov.uk/renewableheatincentive)
- Renewable Heat Incentive Guidance, Volumes One & Two, Ofgem, November 2011
- Renewable Heat Incentive Frequently Asked Questions, Ofgem, June 2012
- The Future of Heating: A strategic framework for low carbon heat in the UK, Department of Energy and Climate Change, March 2012
- Which? Online report: [www.which.co.uk/energy/creating-an-energy-saving-home/guides/renewable-heat-incentive-rhi-explained/your-rhi-questions-answered/](http://www.which.co.uk/energy/creating-an-energy-saving-home/guides/renewable-heat-incentive-rhi-explained/your-rhi-questions-answered/)
- Regulations & Policy Framework Governing the RHI
- Energy Act 2008
- Renewable Heat Incentive Scheme Regulations 2011
- Renewable Heat Incentive: Impact Assessment
- DECC Renewable Heat Incentive Policy Document

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### SERIES 11 MODULE 1: QUESTIONS

## RENEWABLE HEAT INCENTIVE

Please mark your answers on the sheet below by placing a cross in the box next to the correct answer. Only mark one box for each question. You may find it helpful to mark the answers in pencil first before filling in the final answers in ink. Once you have completed the answer sheet in ink, return it to the address below. Photocopies are acceptable.

#### 1. What percentage of the UK's energy needs must be met from renewable sources by 2020?

☐ 10 per cent   ☐ 15 per cent   ☐ 55 per cent   ☐ 80 per cent

#### 2. What percentage of the UK's heating is currently met by natural gas?

☐ 10 per cent   ☐ 15 per cent   ☐ 55 per cent   ☐ 80 per cent

#### 3. How often are RHI payments made?

☐ weekly   ☐ monthly   ☐ quarterly   ☐ annually

#### 4. When was the RHI launched for non-domestic buildings?

☐ Dec 2010   ☐ Nov 2011   ☐ Oct 2012   ☐ Feb 2013

#### 5. Is the RHI currently applicable for single, domestic residences?

☐ Yes  
☐ No, it provisionally will be by Spring 2014  
☐ No, it provisionally will be by October 2013  
☐ No, it will never be applicable

#### 6. Which of the following technologies is no currently eligible for the RHI?

☐ ground source heat pumps  
☐ water source heat pumps  
☐ air source heat pumps  
☐ gas-driven heat pumps

#### 7. Which government department has responsibility of the overarching policy framework of the RHI?

☐ DECC   ☐ DEFRA   ☐ CLG   ☐ Ofgem

#### 8. Which government body has responsibility of the management of the RHI?

☐ DECC   ☐ DEFRA   ☐ CLG   ☐ Ofgem

#### 9. The RHI will be paid for eligible non-domestic systems installed on or after which of the following dates?

☐ 10th Oct 2012   ☐ 15th July 2009   ☐ 15th March 2013   ☐ 10th Nov 2011

#### 10. Which of the following forms of biomass is eligible for the RHI?

☐ biodiesel   ☐ peat   ☐ wood chip   ☐ Landfill gas

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