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# Northern Ireland Renewable Heat Incentive (RHI) scheme

Overview policy paper – Notification under EU Directive 98/34/EC (the  
Technical Standards and Regulations Directive).

*Department of Enterprise, Trade and Investment*

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**Table of Contents**

	<b>Page No</b>
<b>Executive Summary</b>	3
<b>Chapter 1 - Introduction</b>	6
<b>Chapter 2 - Overview of the Northern Ireland RHI scheme</b>	8
Objectives	
Beneficiaries	
Eligible technologies and installations	
RHI tariffs	
RHI payments	
Duration	
Reviews	
Costs and benefits	
Funding	
Administration	
Interaction with other incentive schemes	
<b>Chapter 3 - RHI scheme and State Aid</b>	17
The State Aid element of the RHI scheme	
Compatibility of the State Aid element with the EP Guidelines	
<b>The non-state aid element of the NI RHI scheme</b>	
<b>Annex A – RHI tariff setting methodology</b>	22
<b>Annex B – Proposed RHI tariffs</b>	34
<b>Annex C – Primary Legislation</b>	35
<b>Annex D – Draft Subordinate Legislation</b>	36
<b>Annex E – Economic Appraisal of the Northern Ireland Renewable Heat Incentive</b>	37

## EXECUTIVE SUMMARY

1. The Department of Enterprise, Trade and Investment (DETI) is responsible for the development and maintenance of an appropriate legislative and policy framework for energy in Northern Ireland. In September 2010, the Department published the Strategic Energy Framework (SEF)<sup>1</sup> for Northern Ireland, outlining energy policy for the next 5-10 year period. The vision is for a competitive, sustainable, reliable energy market at the minimum cost necessary.
2. The agenda for developing renewable energy solutions and securing real reductions in energy consumption to enhance sustainability is driven by environmental policy, aimed at reducing harmful emissions. However, pursuing sustainability in energy also offers opportunities to enhance security of energy supply by introducing alternative generation sources, which are not subject to the price volatility of imported fossil fuels. Furthermore, development of indigenous sources offers opportunities for diversification and alternative sources of income. The need to increase security of supply within the heating market is a major issue for Northern Ireland given the current dependence on oil for heating requirements.
3. The EU Renewable Energy Directive<sup>2</sup>, published in the Official Journal of the European Union on 5 June 2009, requires that the United Kingdom achieves a level of 15% renewable energy by 2020. In order to meet this legally binding target the Department of Energy and Climate Change (DECC) has set targets of 12% renewable heat and 30% renewable electricity by 2020 for the UK as a whole. To support the development of the renewable heat market from a level of 1.5% (2009) to the target of 12% by 2020, DECC has developed a Renewable Heat Incentive (RHI) which supports the deployment of specific renewable heat technologies through incentive payments dependent on actual heat delivery. This scheme (SA. 32125) was considered by the EU Commission and it was deemed compatible<sup>3</sup> with the internal market in accordance with Article 107(3)(c) Treaty on the Functioning of the European Union (TFEU)<sup>4</sup> and therefore no objection was raised.
4. In addition, a draft of the regulations developed by DECC to implement the GB RHI, known as the Renewable Heat Incentive Regulations 2011, was notified to the European Commission in accordance with Directive 98/34/EC of the European Parliament and of the Council laying down

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<sup>1</sup> [http://www.detini.gov.uk/strategic\\_energy\\_framework\\_sef\\_2010\\_-3.pdf](http://www.detini.gov.uk/strategic_energy_framework_sef_2010_-3.pdf)

<sup>2</sup> [http://ec.europa.eu/energy/climate\\_actions/doc/2008\\_res\\_directive\\_en.pdf](http://ec.europa.eu/energy/climate_actions/doc/2008_res_directive_en.pdf)

<sup>3</sup> [http://ec.europa.eu/competition/elojade/isef/case\\_details.cfm?proc\\_code=3\\_SA\\_32125](http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_32125)

<sup>4</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12008E107:EN:HTML>

a procedure for the provision of information in the field of technical standards and regulations (OJ L 204, 21.7.1998, p. 37) as amended by Directive 98/48/EC (OK L 217, 5.8.1998, p.18). Again, no objection was raised.

5. This RHI, however, only applies to Great Britain i.e. England, Scotland and Wales. However, Northern Ireland is expected to contribute to the UK target and has set a target in the SEF of 10% renewable heat by 2020, against a baseline position of 1.7% in 2010. In order to meet this target, and also contribute to the wider UK target, a similar incentive scheme to that in GB is required to stimulate growth in the Northern Ireland renewable heat market. Similar to the position in GB, renewable heat technologies in Northern Ireland are currently not able to compete financially with fossil fuel alternatives. There are several significant barriers to deployment, including capital costs; 'hassle' factors; and lack of understanding of renewable heat technologies. If these issues are not addressed then the targets will be missed.
6. DETI has chosen to develop a separate RHI for Northern Ireland rather than adopting the GB scheme given the differences in the two heat markets. The most significant difference is the composition of the heating market. Northern Ireland is very reliant on oil with only an emerging natural gas market, in comparison to the GB market which is dominated by natural gas with a much smaller oil market. This fundamental difference in the heat markets means that different levels of incentive are required to encourage people to switch to renewable heat, i.e. there is a different counterfactual position. DETI has also considered a number of other issues in the development of its RHI policy – including, the impact on fuel poverty (there are much higher levels in NI), the differences in energy prices (both fossil fuel and renewable) and the role of additional technologies (deep geothermal, bioliquids and air-source heat pumps (ASHPs)).
7. The final design of the Northern Ireland RHI is very similar to that already approved by the EU Commission and in place in GB; however there are differences in terms of tariffs and banding of technologies. As for GB, the financial support provided by the Northern Ireland RHI scheme is in the form of a range of pence/kWh tariffs for useful heat generated from renewable technologies. The tariffs cover the cost difference between heat generated from renewable technologies and heat generated from fossil fuel sources (and vary by technology and size of the installation).

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8. DETI intends to introduce the RHI scheme in Autumn 2012 because of the need to meet the targets set by 2020 and to utilise funding allocated by the UK Government for the scheme. In addition, the longer the scheme is delayed, the greater the disadvantage faced by both Northern Ireland consumers and those within the renewable heat sector, given that the scheme has already been implemented across the rest of the UK.
  
9. A consultation on the proposed NI scheme was undertaken between July – October 2011, and this was informed by an independent economic appraisal carried out by expert consultants. Following the consultation further economic analysis was carried out to address issues raised by key stakeholders. This additional analysis informed the final policy position.
  
10. All necessary approvals for the NI scheme are now in place (including EU Commission approval in respect of State Aid (**SA 34140 UK C (2012)**)), DETI is therefore notifying this scheme and the proposed regulations under the EU Directive 98/34/EC (the **Technical Standards and Regulations Directive**) just as DECC had previously notified the GB regulations.

**Chapter 1 - INTRODUCTION**

11. The Renewable Energy Directive (2009/28/EC) sets a binding target that 20% of the EU's energy consumption coming from renewable sources by 2020. The UK share of this target is 15% and DECC has set targets of 12% renewable heat and 30% renewable electricity by 2020 to support the achievement of this legally binding target. Northern Ireland, as part of the member state, is expected to contribute to the UK targets and therefore must consider measures to increase the levels of renewable energy.
12. The Strategic Energy Framework (SEF), endorsed by the Northern Ireland Executive and published by DETI in September 2010, sets ambitious targets for renewable energy generation. For renewable electricity a target of 40% was set and , the main incentive measure of the Northern Ireland Renewables Obligation (NIRO) is already in place and well-established. However, currently in Northern Ireland no scheme is in place for renewable heat.
13. For renewable heat a target of 10% has been set by the Northern Ireland Executive. The current heat demand in Northern Ireland has been assessed as being 17,362 GWh per year, of which around 1.7% (300 GWh) is from renewable sources. Looking forward to forward to 2020, Northern Ireland's overall heat demand is predicted to drop from 17.4 TWh per year to 16.7 TWh per year, with rises in demand from new development being outweighed by reductions in demand with efficiency improvements in the existing sector. The 10% for renewable heat therefore equates to 1.6TWh (or an additional 1.3 TWh when considering existing levels).
14. In order to achieve this target DETI must seek to introduce financial incentives and appropriate policies that will remove barriers to the deployment of renewable heat and allow renewable heat technologies to compete with the existing fossil fuel alternatives. This proposal, similar to GB, is to provide financial support in the form of a range of tariffs (pence per kWh) to incentivise the utilisation of a range of renewable heat technologies.

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15. The powers to introduce the RHI scheme in Northern Ireland are provided by the Energy Act 2011<sup>5</sup> (primary legislation). The details of the scheme will be prescribed and enforced through secondary legislation (draft attached at Annex D).
  
16. DETI launched a consultation on the design and implementation of the Northern Ireland RHI in July 2011, this consultation was open for comment until October 2011. Following this engagement DETI reassessed some elements of the scheme, specifically - banding and tariffs and some of the technology assumptions. Following this analysis a final scheme was agreed.
  
17. It should be noted that the Northern Ireland scheme is very similar to the GB RHI which is already in place. The major difference in the two schemes is that the Northern Ireland tariffs tend to be lower than those offered in the GB scheme. This is due to the fact that the Northern Ireland tariffs are designed against an oil counterfactual rather than a natural gas counterfactual. As oil is a more expensive fossil fuel, less of an incentive is required to switch to renewable heat. There are also some differences in banding and eligibility standards.
  
18. This document is structured as follows;
  - a. Executive Summary
  - b. Introduction (current Chapter)
  - c. Overview of the Scheme
  - d. Annexes, including tariff setting methodology, the proposed levels of support, the draft regulations and regulatory impact assessment.

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<sup>5</sup> <http://www.legislation.gov.uk/ukpga/2011/16/part/3/crossheading/northern-ireland-renewable-heat-incentives/enacted>

**Chapter 2 - OVERVIEW OF THE NI RHI SCHEME****Objectives**

19. The primary objective for the Northern Ireland RHI is to increase the uptake of renewable heat to 10% by 2020 (baseline position of 1.7% in 2010). The 10% for renewable heat equates to 1.6TWh (or an additional 1.3 TWh when considering existing levels).
20. This will be achieved through the introduction of financial incentives with payments made to installers of renewable heat technologies – the tariffs are dependent on the type and size of technology installed and are set in the form of pence per kilo watt hour (p/kWh).
21. Renewable heat technologies are currently unable to compete with existing fossil fuel alternatives given the often higher capital costs and also the lack of understanding and awareness amongst consumers of what are often seen as innovative technologies. In order to help develop this market, DETI will consider the implementation of both policy instruments and financial incentives. Without these measures being put in place there is a risk of market failure and Northern Ireland will not achieve either the targets set for renewable heat by the Northern Ireland Executive in the SEF or be able to contribute to the UK target set under the Renewable Energy Directive. As a result of implementing the NI RHI we expect that, as the market share of renewable heat increases, that barriers to deployment will diminish and ultimately costs of these technologies will reduce.
22. The Northern Ireland RHI will also have associated benefits. Northern Ireland is currently overly dependent on oil for heating demand (77% of total demand<sup>6</sup>), therefore the RHI has been designed to primarily (but not exclusively) focus on displacing oil. The increase of renewable heating, at oil's expense, will support the DETI energy policy goal of increased energy security. This will also have a significant impact on carbon emissions levels and will assist in Northern Ireland reducing emissions in line with EU objectives. DETI also expect there to be increased opportunities for 'green jobs' and 'green skills' as this sector develops.

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<sup>6</sup> Study into the potential development of the renewable heat market in Northern Ireland, AECOM Ltd and Pöyry Energy Consulting, 2010

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**Beneficiaries**

23. For the targets set to be achieved, renewable heat levels will need to increase across all areas in society (domestic, public sector, commercial, industrial etc). Initially, however, and in line with the approach taken by GB, the scheme will only be open to non-domestic consumers. Further work is required before the domestic sector can be introduced to the RHI and DETI wish to implement the scheme as soon as possible without additional delay. DETI intend to extend the scheme to the domestic sector as part of a second phase of the scheme.
24. The non-domestic sector is the area where the most cost-effective renewable heat applications can be installed and barriers such as available financing and understanding of different technologies are much less of an issue. Beneficiaries will therefore be those in the non-domestic sector who can avail of the scheme, as well as the local renewable heat industry that will enjoy the associated benefits of increased business opportunities.
25. There will also be benefits for intermediaries, such as energy service companies (ESCOs) that would be entitled to act for households or commercial businesses. The rationale for allowing intermediaries such as energy service companies to benefit is that they may be required to promote wider take-up of the scheme.
26. The RHI payments will be made to the owners of the eligible renewable heat installations (this may include ESCOs) and to producers of biogas and biomethane. The scheme will open to all Northern Ireland consumers (all sites must have a valid Northern Ireland postcode).

**ELIGIBLE TECHNOLOGIES AND INSTALLATIONS**

**Eligible technologies**

27. The Northern Ireland RHI scheme intends to incentivise a range of renewable heat technologies and fuel sources, in line with the Renewable Energy Directive. These include;
- Ground source heat pumps
  - Water source heat pumps
  - Deep geothermal
  - Solar thermal (up to 200kw)

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- Solid biomass (including municipal solid waste)
- Biogas combustion (excluding landfill gas and up to 200kw only)
- Biomethane (excluding landfill gas)

28. There are also a number of renewable heat technologies and fuel sources that will not be supported from the outset of the scheme but may be introduced later through scheduled reviews.

29. The technologies not included from the outset include large solar thermal or biogas installations (above 200kW), biogas or biomethane from landfill gas, bioliquids and air source heat pumps (ASHPs). For these technologies further analysis needs to be carried out on the correct tariff levels as well as determining methodology for measuring and metering the useful heat output.

30. DETI plans to carry out regular reviews of the RHI scheme and the introduction of these technologies, as well as other issues, will be considered as part of those scheduled reviews. As the priority for this scheme is to increase renewable heat levels to 10% by 2020 it is essential that the scheme is implemented as soon as possible, additional technologies can be considered at a later date.

**Eligible installations**

31. The Northern Ireland RHI scheme will be open to two categories of eligible renewable heat installations;

- New installations commissioned after the introduction of the RHI scheme (aimed for 1 April 2012), and;
- Installations commissioned from 1 September 2010<sup>7</sup><sup>8</sup> but prior to the introduction of the RHI scheme (*the transitional period*).

32. Installations commissioned during *the transitional period* have been deemed eligible to receive RHI payments from the outset of the scheme and should be considered as continuing existing aid

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<sup>7</sup> The date at which installations have been deemed eligible follows an announcement by the DETI Minister in September 2010, this was the first indication that DETI would seek to introduce a Northern Ireland RHI. This announcement followed significant research into the heat market that suggested a tailored RHI for Northern Ireland was the most suitable approach for increasing the uptake of renewable heating technologies.

<sup>8</sup> <http://www.northernireland.gov.uk/index/media-centre/news-departments/news-deti/news-deti-september-2010/news-deti-200910-foster-recognises-importance.htm>

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under new arrangements – this is the same approach taken by DECC for the GB scheme, which supports installations commissioned since 15 July 2009.

33. The aim of the transitional arrangements, similarly to GB, is to have a smooth transition from grant based incentives to the RHI. In order to avoid over-incentivisation, new installations commissioned after the start of the scheme will not be able to receive both grants and RHI payments. Installations commissioned during *the transitional period* that received Government grant from another Department will have to either repay the grant or agree to a reduced incentive payment (length of tariff). Installations commissioned prior to 1 September 2010 will not be eligible for RHI payments.
34. By committing to support technologies commissioned during *the transitional period*, DETI is aiming to avoid a 'wait-and-see' culture where those planning to install would delay plans until the final policy position is in place. This would be very harmful to the industry and could lead to the market stalling and then not being prepared for new business when the scheme is in place. By supporting technologies from 1 September 2010, DETI has sought to give confidence to consumers wishing to install and allow the market to continue to develop. These installations have also been important in supporting the targets set and preparing the market for the RHI when in place.

**Additional requirements**

35. To ensure standards are achieved and maintained, DETI will require that all small scale installations (less than 45 kWth) are subject to technical specification under the Microgeneration Certification Scheme<sup>9</sup> (MCS) and are installed by an MCS accredited installer. This will provide consumer protection and assist in developing confidence in the technologies, by using accredited equipment and installers.
36. The MCS is an independent certification scheme and has been accredited under the European standard EN 45011 by the United Kingdom Accreditation Service (UKAS), which certifies low carbon and renewable energy technology products (up to 45 kWth).<sup>10</sup> Products and installers certified under an equivalent scheme accredited under EN 45011 are also eligible.

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<sup>9</sup> <http://www.microgenerationcertification.org/>

<sup>10</sup> The MCS product scheme was notified to the European Commission in August 2007 under the European Technical Standards Directive (Notification 2007/0458/UK).

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37. The MCS, or equivalent, standards do not apply to systems larger than 45 kWth. In the most part these systems will be bespoke and will be manufactured and installed by technical experts, therefore the same standards are not required.
38. Heat meters will be required for all installations so accurate recordings of actual heat output can be recorded and payments made. Only heat meters specified under the Annex MI-004 of the <sup>11</sup>Directive of the European Parliament on measuring instruments (2004/22/EC) will be eligible under the scheme.

**RHI Tariffs**

39. The RHI tariffs have been calculated to cover the cost difference between traditional fossil fuel heating systems and a renewable heat alternative. The tariffs account for the variances in capital costs, in operating costs, as well as seeking to address non-financial 'hassle' costs. The tariff is generated against a counterfactual position of heating oil, this is due to the fact that Northern Ireland is primarily dependent on oil and most of those switching to renewable heat will be oil consumers.
40. Tariffs vary depending on the type and size of technology to ensure that financial support is targeted for the specific installation and so over-compensation is avoided. Tariffs are paid for 20 years (the lifetime of the technology) and are '*grandfathered*<sup>12</sup>', however they will be amended on a yearly basis, for existing installers and new schemes, to reflect the rate of inflation.
41. The RHI tariffs consist of dedicated and non-dedicated tariffs (detailed in table below). "Dedicated tariffs" are tariffs set at specific levels based on the specific installation technology and size for which they are intended. However, for certain technologies there is currently not sufficient data or time to develop a dedicated tariff before the start of the RHI scheme. Additional dedicated tariffs will be considered as part of future reviews and will be subject to separate State Aid notification.

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<sup>11</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:135:0001:0080:EN:PDF>

<sup>12</sup> Provides certainty for an investor by setting a guaranteed support level for projects for their lifetime in a scheme, regardless of future reviews

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42. There are a number of technologies that, whilst not having a dedicated tariff, will be eligible to receive another tariff where there is sufficient information that the relevant tariff will not result in overcompensation:

<b>Renewable Heat Technology</b>	<b>Tariff</b>
Ground Source Heat Pump	Dedicated
Water Source Heat Pump	Ground Source Heat Pump <sup>13</sup>
Deep Geothermal	Ground Source Heat Pump <sup>14</sup>
Solar	Dedicated
Solid Biomass	Dedicated
Municipal Solid Waste	Solid Biomass
Biogas	Biomethane <sup>15</sup>
Biomethane	Dedicated

43. The tariffs have been designed through liaison with external consultants and subject to an economic appraisal and analysis. The tariff setting methodology, as proposed, is detailed in Annex A, and an overview of the proposed tariffs is included at Annex B.

**RHI Payments**

44. RHI payments will be made on a quarterly basis and are determined by multiplying the applicant's actual (metered) heat output with the relevant tariff level. Under the RHI only 'useful heat' is deemed eligible; this is defined as heat that would otherwise be met by fossil fuels, this excludes deliberately wasting or dumping heat with the sole purpose of claiming incentive payments.

45. In circumstances where beneficiaries are suspected of wasting heat just to claim incentives DETI, or another enforcement body, will have the power to investigate. It is, however, expected that

<sup>13</sup> The ground source heat pump (GSHP) has been selected as a proxy because water source heat pumps (WSHPs) are expected to be more expensive than air source heat pumps (ASHPs), based on evidence provided by consultants and stakeholders. In addition, the technical characteristics of WSHPs are more akin to those of GSHPs.

<sup>14</sup> Geothermal heat costs are expected to be significantly higher than GSHP costs based on evidence from consultants and stakeholders. A call for evidence on deep geothermal energy has been carried out and will inform a potential future tariff level for this technology.

<sup>15</sup> Biogas is eligible for installations <200KW. Up to that scale evidence from consultants and stakeholders shows that biogas costs will be higher than biomethane costs.

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the risk of wasting/dumping heat in the commercial sector will be much less than in the domestic sector as RHI payments will be only one of many factors in deciding to run a renewable heat technology.

46. At this stage, as the RHI only applies to the non-domestic sector, all renewable heat installations will be required to be accompanied with a heat meter that will determine actual heat output. Heat meters are already common in many commercial applications and therefore should not be a barrier to uptake. Meters will allow for accurate readings to be taken of actual heat usage and appropriate payments made. They will also ensure accurate statistics are maintained throughout the lifetime of the scheme.
47. Further to enforcement powers mentioned above, all beneficiaries will be required to submit an annual declaration to the scheme administrator to confirm that the installation is in working order, being maintained and is being used for eligible purposes. There is an obvious incentive to keep the equipment maintained given that payments are made on metered output.

**Tariff and scheme duration**

48. Payments will be made by the scheme administrator on a quarterly basis for the lifetime of the technology (maximum of 20 years). Tariffs are grandfathered so beneficiaries will receive a consistent level of support over the lifetime of the installation with the only revision being adjustments for inflationary pressures. The profiles of the tariffs and the length of scheme are consistent with the GB RHI and other renewable energy schemes (Renewables Obligation and Feed-in-Tariffs).
49. It is expected that the NI RHI will be open to new installations until 2020, meaning the final payment from the scheme will be in 2040. This long term commitment will make a significant impact on the renewable heat market, providing the necessary incentives and confidence to invest in renewable heat technologies.

**Reviews**

50. The NI RHI will have scheduled reviews built-in to the scheme to allow DETI to ensure that the scheme remains fit for purpose and value for money for the duration. The scope of these reviews will include analysis of tariffs (either to be reduced or increased), the appropriateness of

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technologies (remove existing technologies or add new innovative ones) and the assessment of effectiveness and success. The RHI scheme will therefore be subject to re-notification to the Commission as required.

**Costs and Benefits**

<b>RHI Benefits by 2020</b>	
Additional renewable energy	1,860 GWh
Total CO2 emissions displaced	5MtCO2
Number of renewable heat installations	25,000
<b>RHI Costs by 2020</b>	
Subsidies paid (2010) prices	£84m

**Funding**

51. Similar to the GB RHI scheme, the NI RHI will be funded directly through normal Government expenditure. Funding for the NI RHI has been provided by Her Majesty's Treasury as a pro-rata share of funding allocated to the GB scheme. The NI RHI will continue to be funded in this manner for the lifetime of the two schemes.

**Administration**

52. DETI has proposed that the GB energy regulator, Ofgem, will act as the administrator of the NI RHI scheme. Ofgem's responsibilities would include registering and accrediting installations, calculating and making payments, monitoring compliance and ensuring the conditions of the scheme are met. Ofgem has a track record in administering large scale renewable energy schemes (RO, FITs and the NIRO) as well as developing and implementing the GB RHI.

**Interaction with other incentive schemes**

53. To avoid overcompensation, the general approach under the NI RHI is that, where potential beneficiaries have already received Government support (capital grant) for an installation, there

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will be the option to repay the grant or receive a reduced tariff (in terms of length of years).

Under no circumstances will beneficiaries be able to retain grant support and receive full incentive payments.

54. DETI has also sought to address issues where installations might be in receipt of both incentives for renewable heat generation and renewable electricity generation. Specifically, in relation to incentive payments for renewable electricity through anaerobic digestion (AD), DETI has excluded AD systems that are in receipt of ROCs from claiming RHI payments.

**ANNEX A – RHI TARIFF SETTING METHODOLOGY****Introduction**

1. This Annex provides further information on how the tariffs for the NI RHI have been set and includes an overview of the methodology and technology assumptions used. The tariffs detailed below are set for the non-domestic sector and are categorised by type and size of technology.
2. The tariffs are those detailed in the public consultation launched by DETI in July 2011. DETI is now carrying out further analysis work on the tariffs and the assumptions contained within the methodology. It is possible the tariffs may change in advance of the scheme, however should this happen DETI will inform the Commission immediately and provide the necessary supporting evidence. DETI have chosen to provide this notification ahead of revised tariffs given the timescales for implementation.

**Objectives**

3. The main objectives in designing the NI RHI tariffs are;
  - To support a range of technologies, installation sizes, and investors to order to achieve 10% renewable heat by 2020;
  - To provide adequate compensation as to create a level a level playing field between renewable heat technologies and fossil fuel alternatives whilst avoiding overcompensation;
  - To consider potential linkages with other renewable energy support mechanisms (primarily the Northern Ireland Renewables Obligation) and to guard against areas of overcompensation in these areas.

**Tariff Calculation**

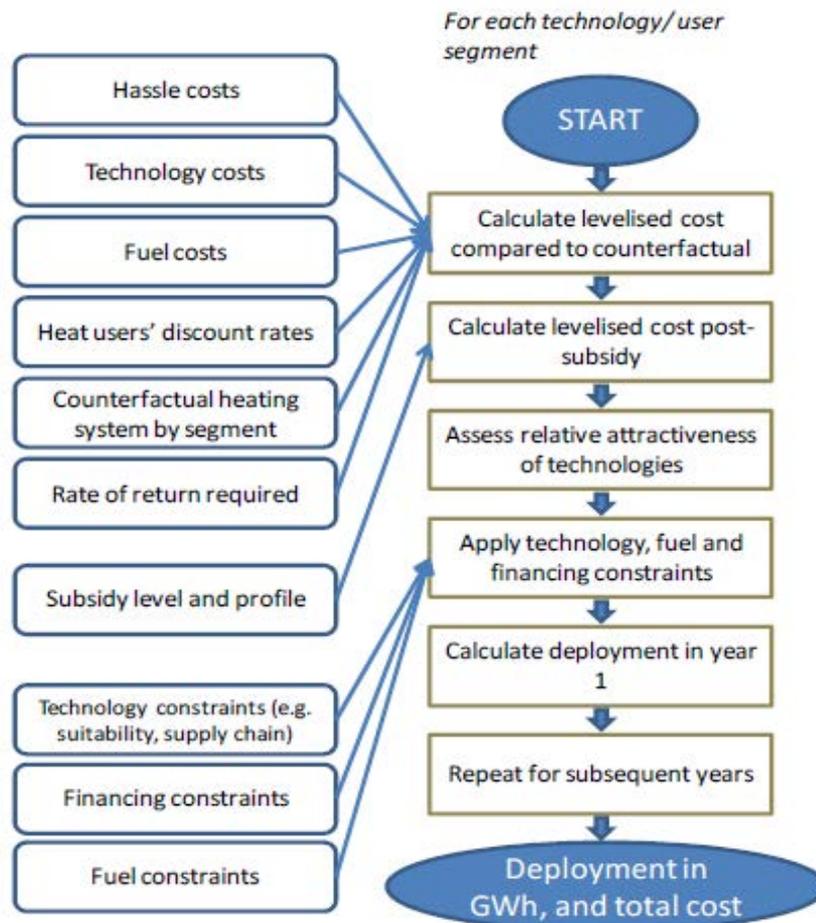
4. As previously mentioned, the RHI tariffs (set at pence per kilo watt hour of renewable heat output) are designed to cover the cost difference between the heat generated from renewable heat technologies and heat generated from the fossil fuel alternative (for Northern Ireland oil is

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set as the “fossil fuel counterfactual”). This cost difference accounts for capital costs and ongoing operating costs. The tariff also includes consideration of non-financial costs or ‘hassle factors’ that installers might face when considering renewable heat.

5. A rate of return is also offered on the net capital expenditure to ensure the renewable energy technology is attractive to investors. This rate of return is also essential to reflect the potential financing costs of the investment as well as accounting for the perceived risk associated in investing in a relatively new technology.
6. The tariff setting methodology has three general principles:
  - a. Renewable installations are divided depending on the type of technology and size of installation;
  - b. Within each banding a reference technology is chosen to develop a consistent tariff across technologies and scales; and
  - c. The net costs (difference between capital and operating costs of fossil fuel counterfactual and renewable alternative) are calculated and a tariff determined.
7. A more detailed schematic of all the various inputs required to determine the tariff level is shown below.

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### **Tariff Banding**

8. Tariff banding is a common feature of the Renewables Obligation, the Feed-in-Tariff and the Northern Ireland Renewables Obligation. It is used within the NI RHI to guard against potential overcompensation by grouping technologies by size and designing an appropriate tariff for that specific size of technology. By banding technologies with similar costs the tariffs are therefore more reflective of costs associated with that installation.
  
9. In order to minimise the complexity of the scheme and to make sure that it is as accessible to consumers as possible, the number of bands are quite low. The proposed banding is detailed, along with the tariffs, at Annex B.

### **Reference Installation**

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10. Whilst banding is used to group installations with similar costs together it is inevitable that within bands there will still be variation in terms of costs, performance and required tariff level. It is clear that differences will arise depending on the location and use of the installation, for example a domestic installation in a rural setting will have different costs and performance than a small commercial installation in an urban area.
11. In order to set a fixed incentive rate for each band a ‘*reference installation*’ is chosen and the tariff set relates to this installation and provides appropriate subsidy to make it viable. In line with DECC’s methodology, the reference installation is chosen as the installation requiring a subsidy that would incentivise half of the total potential output from the technology that could be taken up across the period 2011-20 if that rate was offered to that band in every year. Total potential output is calculated as heat output that could be achieved if all technically viable segments within the band installed the technology.

**Elements of RHI Tariff Calculation****Costs**

12. The costs are determined by assessing the differences in the costs of installing a renewable technology, over and above the fossil fuel counterfactual. In order to assess these costs data was gathered for a number of components for both the renewable heat technology and the fossil fuel alternative:
- Ongoing Costs
    - o Fuel/electricity costs (variable)
    - o Maintenance costs (fixed)
    - o Ongoing demand-side barrier/administrative costs (non-financial hassle factors)
  - Upfront Costs
    - o Capitals costs of equipment and installation
    - o Up front demand-side barrier/administrative costs (non-financial hassle factors)
13. The ‘hassle’ factor costs are included to account for non-financial choices that consumers have to make when considering the uptake of renewable heat technologies. These account for time/understanding required in considering installing renewable heat technologies, the potential disruption (digging up ground for GSHPs) or the additional space required (biomass

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boilers). Changing to renewable heat is a considerable behaviour change and therefore it is important that non-financial barriers are accounted for.

14. The RHI is designed to provide support on an ongoing basis, over the lifetime of the equipment (a maximum of 20 years). The 20 year payments therefore seek to address all the ongoing and upfront costs which would be additional to the counterfactual installation. The main difference between the method used to calculate the Northern Ireland RHI rates and that used by DECC is that in the Northern Ireland scheme the positive and uniform discount rates are used to value costs in future years and recover upfront costs across heat output in all years.
15. The economic analysis used to design the Northern Ireland support levels is based on a financial model developed by independent consultants. The model examines how much renewable heat could be achieved under different incentive levels and outlines the various results or impacts of different scenarios. In order to do this, the model relies on a number of assumptions, these include consumer behaviours; technology costs and performance; barriers and risks; and ongoing fuel costs. This information is based on existing data which is consistent with the DECC methodology.

**Fossil fuel counterfactual**

16. Given the fact that the heating oil accounts for over 75%<sup>16</sup> of Northern Ireland's heating demand the Northern Ireland RHI tariffs have been set using an oil fossil fuel counterfactual. This approach recognises that prevalence of oil within the Northern Ireland heating market and the fact that the majority of those switching to renewable heat will be doing so from oil.
17. In addition, by setting an oil counterfactual position the most cost-effective applications will be incentivised, given the lower cost differential between renewable heat technologies and oil than that between renewable heat and natural gas.

**Payment method**

18. The Northern Ireland RHI follows the GB RHI model in terms of making payments. Rather than providing up front support for the installation it is proposed that payments are made on a

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<sup>16</sup> Study into the potential development of the renewable heat market in Northern Ireland, AECOM Ltd and Pöyry Energy Consulting, 2010

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quarterly basis over the lifetime of the technology (a maximum of 20 years). This payment profile, rather than an upfront capital grant, was chosen as it provides a long term incentive to invest and to generate renewable heat and it reduces the upfront pressure on Government expenditure.

### **Rate of return**

19. As previously explained, the RHI tariff setting methodology also includes the provision of a rate of return in order to stimulate interest in a developing unknown marketplace and to provide compensation for financing costs of making the necessary investment in capital projects.
20. The rate of return has been set at 12% for all technologies incentivised under the NI RHI, barring solar thermal which has a rate of return of 6%. With regards to solar thermal, a lower rate of return is built-in to the available tariff given that solar thermal will not provide an entire buildings heating demands, only the hot water requirements. In addition, solar thermal is currently the most expensive, per unit of energy, renewable heat technology. If a 12% rate of return was afforded to solar thermal there would be a risk that a substantial amount of available funding would be diverted to support this technology, at the expense of other more cost-effective options. DETI considers it is important, however, that solar thermal is incentivised because it is a well established and easily accessible technology.
21. The proposed rates are in line with the scheme already in place in GB and have been designed in a similar way through analysis by consultants and engagement with stakeholders.
22. The rate of return is generally higher than that afforded to established renewable electricity schemes such as the FiT (5-8% rate of return). The higher return reflects the lack of understanding of the renewable heat market (only 1.7% of market share in comparison to 10%+ share of renewable electricity) and therefore the uncertainty amongst investors. The rate of return also represents the required level of return needed to create the appropriate conditions for the necessary investment to be made to secure the 10% renewable heat target by 2020.

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### **Reviews**

23. There will be scheduled reviews in-built into the Northern Ireland RHI, this will allow the progress of the scheme to be monitored, assessed and, if necessary, changes implemented. The reviews will consider all aspects of the scheme including eligible technologies, tariff levels, fuel prices, banding, rates of return etc. This will allow the scheme to remain fit for purpose and new innovative technologies added and other established technologies, that may no longer need an incentive, be removed from the table of tariffs.
24. The first review is scheduled to start in 2014 with any changes or revisions implemented by 2015. Reviews will be carried out by the DETI.

### **Degression**

25. Degression is a policy instrument used in some existing renewable electricity incentive schemes, including the FiT in GB. It is a mechanism whereby tariffs would be automatically reduced on an annual basis to reflect, and to potentially encourage, the reduction of technology costs for renewable heating.
26. At this stage DETI does not propose to include build degression into the NI RHI legislation, however may consider the need to do so in the future. If degression is introduced consideration will need to be given to an appropriate methodology.

### **Grandfathering**

27. The outcome of future reviews will not impact on existing installations already commissioned and receiving payments under the scheme i.e. tariffs will be '*grandfathered*'. In practice this means that investors will receive the same level of tariff (barring amendments relating to inflation detailed below) for the lifetime of their installation, this applies even if tariffs are altered (increased or decreased) as part of a review.
28. This approach was been proposed for the following reasons;
- a. It is the same approach taken by DECC in the design of the GB RHI and is consistent with the policy design of renewable electricity schemes (RO, NIRO and FiT). Grandfathering is

a key element to increase investor confidence and to remove risk/uncertainty from investing. It also provides a clear and transparent policy framework with investors understanding that whilst the scheme may change in the future that they will not be impacted by those revisions. If investors thought there was a risk that incentive payments would drop in the future, it would be difficult to make long term financial investments; therefore certainty in support levels is vital.

- b. It is essential to reduce risk wherever possible; the renewable heat market in Northern Ireland is much more immature than many other parts of the EU and is considerably less well understood than renewable electricity. In order to deliver significant increases in the levels of renewable heat it is important that risks are reduced and investor confidence developed, grandfathering is a key aspect of this.
- c. The largest element of the RHI tariff relates to the upfront capital cost of the equipment and the difference between the fossil fuel counterfactual, therefore the investment is made considering the payback on the capex. With increased deployment there is the chance the technology prices will reduce, however, those who have installed earlier will not enjoy these cost reductions and will still need to pay off the capex paid. Therefore grandfathering is a method of provide a guaranteed level of support against the considerable capex of a project.
- d. Finally, it must be acknowledged that just as capex costs may differ over time so will input fuel prices (particularly bioenergy). Similarly to capex, it is likely than as these technologies become more common that prices may reduce because of economies of scale and more developed supply chains. The fluctuation of operating costs are more difficult to manage as there could be an argument that support should also fluctuate, however DETI consider this to be neither practical nor good policy-making. Having changeable tariffs would not be practical given the lack of price indicators in both bioenergy and oil, both unregulated tradable assets. This would result in reactive changes, rather than proactive, and would be unmanageable, complex and administratively costly. In addition, it would remove any certainty that investors would have in terms of making investments in technologies. There would be absolute no guarantee on incentive levels and therefore the renewable heat market would not grow, as the renewable electricity has done. As mentioned previously, the immaturity of this market means that risks must be minimised and grandfathering is a key element of creating a level of confidence.

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**Indexation**

29. The Northern Ireland RHI tariffs will automatically adjust each year to account for inflation<sup>17</sup>.

This in line with the approach taken in the GB RHI and the Feed-in-Tariffs scheme. This increase (or decrease where deflation occurs) will apply to all existing participants in the scheme as well as new entrants. This indexation will provide investors with confidence that tariffs will remain appropriate if input costs (fuel, electricity, maintenance etc) increase through inflation.

**Tariff Calculation examples (non-domestic)**

30. In order to demonstrate how the tariffs have been calculated for the Northern Ireland the methodology is illustrated in a number of tables below. The tables highlight how the various technology assumptions produce the following tariffs for;

- i) A small biomass boiler; and
- ii) A large ground source heat pump;

31. All technology assumptions used in setting the tariffs have been developed by independent consultants. Electricity and fossil fuel prices for the conventional form of generation are taken from the UK Government projections of fuel prices. All tariffs will be paid on a quarterly basis over a period of 20 years, providing renewable heat is still being generated.

***Tariff calculation 1: Small biomass boiler (pellet)***

32. As with all the calculations, the tariff for the small biomass boiler (up to 20kWh) is determined by using a reference installation that is closest to the 50% of technical potential under an oil fossil fuel counterfactual. The characteristics of the small scale biomass boiler and the oil counterfactual are detailed below.

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<sup>17</sup> The tariffs for each subsequent year commencing with 1st April and ending with 31st March, are the tariffs applicable on the immediately preceding 31st March adjusted by the percentage increase or decrease in the retail prices index for the previous calendar year (the resulting figure being rounded to the nearest tenth of a penny, with any twentieth of a penny being rounded upwards).

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	Capex (£/kW)	Opex (£/kW/year)	Efficiency (%)	Load Factor (%)	Size (kW)	Lifetime (years)	Fuel cost (p/kWh)	Upfront barrier costs (£)	Ongoing barrier costs (£/year) <sup>18</sup>
<b>Biomass</b>	662	19	85%	17.5%	12	20	5.54	908	177
<b>Oil</b>	183	9.41	93%	10.5%	20	15	5.11	0	0

33. Using these technology characteristics we calculate the following elements of the relevant tariff:

- Compensation for the capital costs;** this is the difference between the capital costs of the renewable technology and the fossil fuel counterfactual whilst applying a 12% rate of return on the difference over the lifetime of the technology.
- Compensation for the operating costs (including annual fuel costs);** this is the difference between the annual running costs of the renewable technology and fossil fuel counterfactual.
- Compensation for the non-financial up front barrier;** this accounts for the hassle factors associated with installing a renewable heat technology not present when installing fossil fuels.

34. The components of the small biomass tariffs are presented below:

	Annuitised Capital cost at 16%	Annual operating costs	Annual fuel costs	Annuitised Upfront barrier costs	Ongoing barrier costs
<b>Biomass</b>	1,339	230	1,196	122	177
<b>Oil</b>	657	188	1,004	0	0
<b>Difference</b>	682	42	192	122	177
<b>Sum of difference</b>	1,246				

Subsidy for	Amount
Annualised capital and barrier costs	4.8
Operating costs	0.2
Fuel costs	1.2

<sup>18</sup> Takes from the figure used in the GB RHI for 107kW commercial biomass boilers, scaled to reflect the assumed difference in the cost of time between domestic (£15/ hour) and non-domestic (£70/ hour) consumers.

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TOTAL	6.2
Convert to quarterly basis	6.0
Adjust for inflation	6.2

**Tariff Calculation 2 – Large GSHP**

35. The calculation of the large scale GSHP (installations over 100KW) follows the same principles as those set out in the small biomass calculation. The characteristics of the large GSHP installation and the fossil fuel counterfactual technology used in to set the tariff are outlined below.

	Capex (£/kW)	Opex (£/kW/year)	Efficiency (%)	Load Factor (%)	Size (kW)	Lifetime (years)	Fuel cost (p/kWh)	Upfront barrier costs (£)	Ongoing barrier costs
<b>Ground Source Heat Pump</b>	900	1.05	360%	36%	200	20	12.14	3,951	66
<b>Oil</b>	68	1.47	89%	20%	360	15	4.86	0	0

36. The components of this tariff are presented below.

	Annuitised Capital cost at 12%	Annual operating costs	Annual fuel costs	Annuitised Upfront barrier costs	Ongoing barrier costs
<b>Ground Source Heat Pump</b>	24,098	209	21,276.	529	66
<b>Oil</b>	3,594	529	34,479	-	0
<b>Difference</b>	20,504	-320	-13,203	529	66
<b>Sum of difference</b>	7,576				

Subsidy for	Amount
Annualised capital and barrier costs	2.9
Operating costs	-0.1
Fuel costs	-1.6
<b>TOTAL</b>	<b>1.3</b>
Convert to quarterly basis	1.2
Adjust for inflation	1.3

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## ANNEX B –Northern Ireland RHI Tariffs

Tariff name	Eligible Technologies	Size range (kW)	NI RHI tariff (pence per kWh)	Length of tariff
Biogas injection	Biomethane injection and biogas combustion, except from landfill gas	Biomethane all scales, biogas combustion less than 200kWth	3.0	20 years
Biomass boilers	Solid biomass; Municipal solid waste (inc. CHP)	Less than 20kWth	6.2	20 years
		20 kWth and above up to but not including 100 kWth	5.9	20 years
		100 kWth and above up to but not including 1000 kWth	1.5	20 years
GSHP	Including water source heat pumps and deep geothermal	Less than 20kWth	8.4	20 years
		20 kWth and above up to but not including 100 kWth	4.3	20 years
		100 kWth and above	1.3	20 years
Solar Thermal		Below 200 kWth	8.5	20 years

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**ANNEX C – Sections 113 and 114 Energy Act 2011**

**(Attached separately)**

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**ANNEX D – Draft Regulations**

**(Attached separately)**

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**ANNEX E – Impact Assessment relating to Sections 113 and 114 of the Energy Act 2011**

**(Attached separately)**

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**ANNEX E – Regulatory Impact Assessment**

**(Attached separately)**