From:	McCay, Davina
To:	Mills, John (DETI)
Cc:	Sinton, Dan
Subject:	Casework Committee Approval for Phase 2 of the Northern Ireland Renewable Heat Incentive
Date:	20 May 2014 16:27:54
Attachments:	Covering Memo.tr5 Final Synopsis.tr5 Domestic RHI Business Case v1.tr5 Annex A - Economic Analysis of measures included in Phase 2 of NI RHI.tr5 Annex B - RHI Risk Register.tr5

John

Please find attached trim references to casework papers in respect of Phase 2 of the Northern Ireland Renewable Heat Incentive.

Joanne McCutcheon had first contacted Accountability and Casework Branch in early April to ascertain if DFP and Casework approval were necessary for Phase 2, given that both Casework and DFP approval were granted in April 2012 for the £25m pot to cover the Non-Domestic RHI and the Renewable Heat Premium Payment Scheme as well as the forthcoming Phase 2. Accountability and Casework branch confirmed on 2 May that while DFP approval for the expenditure would not be required, casework approval would be required. Peter confirmed at this point that Accountability and Casework Branch should proceed to set up a Casework Committee meeting, however they later advised that the protocol has now changed and it is for individual branches to set up the meeting via the appropriate personal secretaries.

I now attach:

- Covering memo from David Thomson to Eugene Rooney which sets out the background to the Domestic RHI;
- Final Synopsis of the Scheme; and
- Business case (which requires your signature).
- Annexes
    - CEPA analysis of the Domestic RHI; and
    - Risk Register

I have updated the risk register to replace Joanne and Peter's name with mine – this can then be updated again when the permanent G7 arrives.

The first step is to get the actual meeting set up through Iris Johnston who is both David Thomson and Eugene Rooney's personal secretary. Accountability and Casework branch will attend and take minutes of the meeting – I have spoken to Rachel Linton who has confirmed that she will attend. You may also want the Energy Division Economist to attend the meeting as they have provided their view on the business case.

I have tried to contact Iris to start the process but understand she is on leave today. I now attach the relevant papers for issue to David Thomson – the meeting can be set up and the dates added in to the covering memo before it issues to Eugene Rooney. The cc list on the covering memo will also need to be updated with the names of the Casework Committee members once this has been determined.

Happy to discuss

Regards

Davina

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Department of Enterprise, Trade and Investment
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To: Eugene Rooney

Date: May 2014 **Copy Distribution List Below**

From: David Thomson

CASEWORK PAPERS FOR PHASE 2 OF THE NORTHERN IRELAND RENEWABLE HEAT INCENTIVE

You will have received papers outlining the proposals from Energy Division regarding the introduction of the second phase of the Northern Ireland Renewable Heat Incentive (RHI). These papers are to inform the meeting of the Casework Committee scheduled for **Monday 9 June** at **3pm**.

The RHI is a major policy initiative designed to develop the renewable heat market to an overall market share of 10% by 2020, in-line with EU and SEF targets. To support the uptake of renewable technologies, the RHI is designed to provide ongoing support to equalise the cost of conventional heating and alternative renewable heating technologies. Phase 1 of the scheme (which is for the non-domestic market) was launched in November 2012 following Casework, DFP and Ministerial approvals. At that time, the business case made clear that the department intended to extend the scheme to the domestic market in due course and the DFP approval covers the total expenditure.

In the interim, the domestic market has been supported through the Renewable Heat Premium Payment scheme (RHPP) which provides capital support towards the costs of installations.

Significant work and research has already been undertaken by Energy Division to assess how the RHI scheme can be developed for the domestic market and the appropriate support levels. This work includes procuring consultancy advice to develop policy proposals, a public consultation on the proposals and consideration of how the scheme can best be administered.

The final proposals for the domestic scheme are similar in many ways to the equivalent GB scheme which was launched on 9 April 2014; it is therefore important that the Northern Ireland scheme is implemented as a matter of urgency to ensure that the local renewable heat market is not unduly disadvantaged.

I am content that the proposals outlined have been thoroughly researched, analysed and appraised and note the supportive comments from the economist. This second phase is building on what is already in place and from the evidence available, I consider that the RHI in Northern Ireland represents the most appropriate way for the renewable heat market to be incentivised to a level of 10% by 2020. The development of the renewable heat market will support wider Energy Division policy, and indeed Departmental and Executive policy goals of energy security, reduced emissions and 'green jobs'.

I would be grateful if you consider the documentation provided in assessing the appropriateness of this scheme.

David Thomson
Head of DETI Policy Group

Cc: John Mills
Trevor Cooper
Mike Thompson
Alan Smith
Davina McCay
Dan Sinton

Synopsis of the case for a Domestic Renewable Heat Incentive for Northern Ireland.

This paper outlines why a Renewable Heat Incentive (RHI) is required in Northern Ireland, the progress made to date on the incentivisation of renewable heat through Phase 1 of the RHI and the Renewable Heat Premium Payment Scheme (RHPP) and the proposals for extending the scheme to the domestic market.

a) Background

The Department of Energy and Climate Change (DECC) has indicated that renewable heat levels of around 12%, coupled with 30% renewable electricity consumption are required for the UK to meet its requirements under the EU Renewable Energy Directive. Subsequently, the Strategic Energy Framework (SEF) was agreed by the Northern Ireland Executive in September 2010 and a target of 10% renewable heat by 2020 was included; this is a challenging target given that the baseline level at that time was 1.7%.

Renewable heat technologies are currently unable to compete with existing fossil fuel alternatives, given the 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 and meet the targets, economic analysis has shown that financial incentives are required.

£860million has been made available from central Government funding to support the introduction of a RHI in GB over the period 2011-2015; HMT notified the Northern Ireland Executive that £25million of funding was available for a NI RHI over the same period.

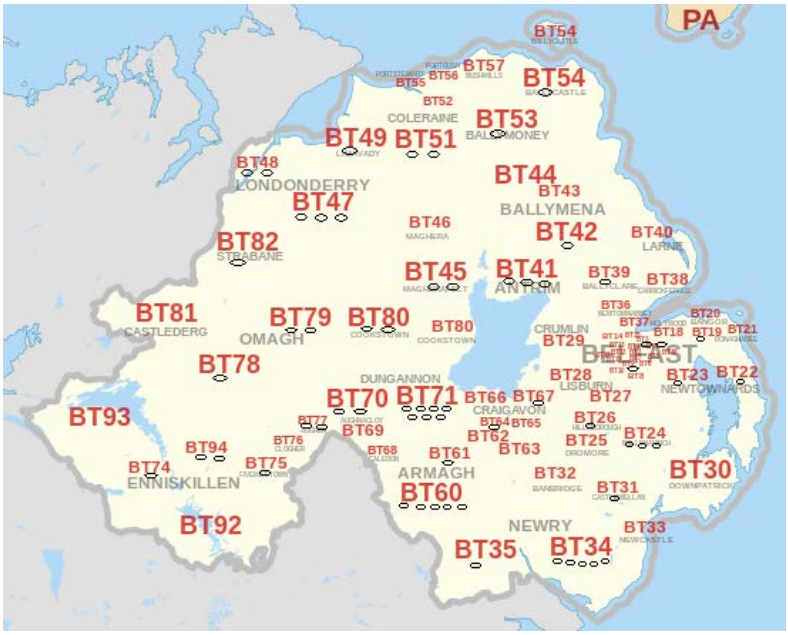
DECC introduced a GB Renewable Heat Incentive for the non-domestic market in November 2011. Northern Ireland was not included within that scheme because of the marked difference in the two heat markets i.e. in GB the natural gas market accounts for 68.8% of heating demand with oil only accounting for 10% whereas in Northern Ireland oil accounts for around 77%. It was therefore considered appropriate to separately assess

how the NI renewable heat market could be developed. Following an economic appraisal and public consultation, proposals for Phase 1 of the NI RHI (for non domestic installations) and for the RHPP (for domestic installations) were approved by DETI Casework, DFP and the Minister. It was made clear at that time that the Department intended to develop a second phase of the RHI which would extend it to include domestic installations.

b) Update on Phase 1 of the RHI

Phase 1 was launched in November 2012. It provides long term financial support for non-domestic properties wishing to switch from conventional heating to renewable heating solutions, such as biomass; heat pumps and solar thermal. Payments are made quarterly, for the lifetime of the installation (maximum 20 years) and are determined by the heat output of the installation and the relevant tariff for the technology installed.

The scheme is administered by Ofgem (the GB Utility Regulator) and as at 7 May 2014 they have received 145 applications. All applications bar one are for solid biomass boilers and the majority have installation capacity in the 20-99 kWh range. The total capacity of the applications to date is in the order of 17MW. The applications received are from across Northern Ireland as shown in the following diagram.



The GB RHI was launched a year before the NI RHI. However, the current NI uptake compares favourably with the GB uptake at the same point in time. The NI scheme is currently tracking at around 7% of GB applications, 7% of accreditations and 4% of heat capacity, suggesting that NI will experience a higher volume of applications but for smaller installations.

c) **Update on the Renewable Heat Premium Payment (RHPP) scheme**

The Renewable Heat Premium Payment (RHPP) scheme was launched in May 2012 as a forerunner to a domestic RHI. This scheme provides grant support to eligible domestic installations and is managed within Energy Division, DETI. As at 7 May 2014, 1700 applications have been received and Energy Division has issued offers to 1223 of these. This represents support of £2.29 million and a total investment in the sector of over £7.7 million.

Four types of technology are supported by the RHPP; Air Source Heat Pumps, Biomass Boilers, Ground Source Heat Pumps and Solar Thermal Panels.

The breakdown of offers by technology is given in the table below.

Technology	**Offers of Support**
Air Source Heat Pumps	11%
Biomass Boilers	50%
Ground Source Heat Pumps	10%
Solar Thermal Panels	29%

At the time of launching the RHPP, the Minister made it clear that the scheme would remain in place until the final domestic RHI policy was considered and all RHPP installations would remain eligible to apply for any RHI.

d) Consultation on Phase 2 of RHI

In February 2013, DETI commissioned CEPA/AEA to undertake an economic appraisal to consider the development of a RHI for domestic installations and some potential amendments to the non domestic scheme

Policy proposals were subject to a public consultation from July - October 2013. The Department received 50 responses to the consultation; these included responses from installers, trade bodies, public sector organisations and members of the public. Analysis of these responses shows that respondents were broadly content with the proposals. In particular, proposals relating to the domestic scheme were almost universally accepted with only very minor suggestions put forward. While responses in relation to the non domestic amendments were also supportive a number of suggestions and queries were raised which require some further consideration. A number of these issues will require liaison with DECC and it is likely that this additional work will take some time to complete. In addition any non domestic scheme amendments will require State Aid approval and European colleagues have advised that this is likely to take 6+ months.

For these reasons it makes sense to launch the domestic scheme ahead of the changes to the non domestic RHI. The domestic RHI could be launched as soon as the required legislation is drafted and passed by the Assembly and an administrative system is designed to manage the application and accreditation process.

e) Proposals for Domestic RHI

Following the economic appraisal into the incentivisation of renewable heat, the following design of the Northern Ireland RHI is proposed. Details of all the options considered are included in the Business Case. The scheme represents a long term approach to developing the renewable heat market by providing consistent, secure, long term payments for renewable heat generation.

The incentivisation involves payments to installers of renewable heat technologies, with tariffs dependent on the type and size of technology installed, and in the form of pence per kilo watt hour (p/kWh) for deemed heat. Payments will be made annually over a 7 year

period. In addition, where an applicant has not previously availed of a RHPP payment, they will receive an upfront payment, equivalent to the RHPP, at the point of accreditation.

The 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.

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 7 years and are *'grandfathered*[1]*',* however they will be amended on a yearly basis, for existing installers and new schemes, to reflect the rate of inflation. The proposed tariffs are outlined below, for ease of reference the equivalent tariffs for the GB scheme are also included. The NI tariffs are generally lower than the GB tariffs; this is because the GB tariffs are based on a gas counterfactual to reflect the difference in the heat market i.e. less incentive is required to encourage customers to change from oil to renewable technologies.

Technology	Initial payment on accreditation (if not a recipient of RHPP)	NI Proposed tariff (p/kWh)	GB proposed tariff (p/kWh)
Solar Thermal	£320	13.1	19.2
Biomass boiler	£2500	5.5	12.2
Bioliquids	£500	2.7	n/a
Ground Source Heat Pump	£3500	8.	18.8
Air to Water Heat Pump	£1700	3.4	7.3

To achieve accreditation, the applicant must have already installed an eligible technology and had it commissioned by a MCS installer. Applicants will need to provide evidence of

[1] Provides certainty for an investor by setting a guaranteed support level for projects for their lifetime in a scheme, regardless of future reviews.

installation including invoices, MCS commissioning certificate, building control certificate, Energy Performance Certificate (EPC) etc. Following accreditation, all beneficiaries will be required to submit an annual declaration to the scheme administrator to confirm that the installation is still in working order, being maintained and is being used for eligible purposes. A sample of claimants will be visited each year to confirm the information provided and all claimants can expect at least one visit over the payment period. RHI payments will continue to be made on an annual basis and will be determined by multiplying the applicant's deemed heat output (calculated from information provided on the EPC) with the relevant tariff level.

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 technologies (remove existing technologies or add new innovative ones) and the assessment of effectiveness and success.

f) Administration of the domestic RHI

The domestic RHI will require an administrative system capable of managing enquiries and applications, ensuring participants meet ongoing obligations throughout the life of the scheme, processing payments, preventing fraud and providing management information. The options for providing this are considered in the Business Case.

It is proposed that the scheme is initially administered within Renewable Heat Branch whilst the specification for an external service provider is determined and procurement undertaken. This has the benefit of allowing the scheme to launch sooner and is also possible because initially the system only needs to facilitate application/accreditation, as it will be a year after accreditation before annual payments become due.

The application/accreditation process will have many similarities with the existing RHPP scheme in terms of the information the applicant needs to provide. The existing RHPP administrative system therefore forms a sound basis for the initial processing and accreditation of installations. Discussions with the DETI IT personnel who developed the

RHPP database have confirmed that the changes required to enable the accreditation of applicants are minimal and can be managed in house.

The current RHPP team consists of a part time DP, an EO1 and 2 part time EO2s. The team has processed around 1500 applications during time the RHPP has been running (approx 2 years). It is anticipated that we may have up to 800 new applications in the first year of a domestic RHI together with the migration of existing RHPP installations.

The current team therefore could not manage the work load beyond the first year as the number of accreditations will rise with an associated rise in the number of payments to be processed and site inspections. In any case DETI IT colleagues have indicated that for data security reasons they are not in a position to develop the ongoing payments part of the system. It is therefore proposed that a procurement exercise is undertaken to appoint an administrator to run the scheme. The costs of developing such a system have been estimated at approximately £60-100k with ongoing annual costs in the region of £600-1500 per application. Exact costs cannot be determined until the procurement exercise is underway. An external IT provider may also be required to facilitate annual payments should in-house delivery have to continue beyond the first year, the cost of which is estimated at around £30k.

g) Benefits

It is expected that the domestic RHI would have a number of benefits, primarily a contribution to the achievement of 10% renewable heat target but also the wider benefits associated with renewable heat in terms of fuel security, lower emissions and ‘green jobs’. Currently Northern Ireland is overly dependent on imported fuel, leaving consumers vulnerable to price fluctuations beyond our control; this is especially true within the heat market. Increased renewable heat will support the promotion of a more diverse, secure, sustainable and competitive heating market – providing greater energy choice for consumers limited by infrastructure issues.

It is expected that the introduction of the domestic RHI will support the deployment of up to 860GWh of renewable heat by 2020 (when considering support for commercial installations the expected level of total renewable heat by 2020 is 1400GWh.)

The expected carbon savings over the lifetime of the RHI policy (domestic and non-domestic) is in the order of 5 million tonnes of CO_2. The value of this carbon, using the DECC carbon saving methodology (central carbon prices), is in the order of £250m.

h) **Displacement**

The main area where displacement will occur, as a result of initiatives on renewable heat, will be in the established heating markets i.e. oil, gas and coal. This displacement will impact on expected market share of these heating types and, if uptake was significantly higher than expected, could impact on jobs and/or prices. Displacement is likely to be most in the oil market given the fact that tariffs are set against an oil counterfactual and most appropriate for existing oil customers switching to renewables.

However given the size of the heat market and the incremental nature of the expected increase in renewable heat the overall displacement is expected to be limited.

As detailed in the SEF, it is a stated policy objective for DETI to extend the gas grid in NI. Renewable heat, as an alternative source of heat, has the potential to impact on this. The deployment of renewable heat is not expected to have any significant impact on the natural gas market – the fact that tariffs are designed against an oil counterfactual means that it is less attractive for natural gas customers to switch to renewable heat. Under the RHPP only 8 systems have been supported where a primary renewable technology has displaced natural gas. This equates to 0.5% of applications. In comparison 89% of applicants advise that the renewable system will displace oil.

In terms of job displacement, whilst new skills are required for the installation of renewables this would displace work that would have otherwise been undertaken on installing the counterfactual technology. The current market developments are that traditional heating companies are developing teams and up skilling staff with expertise in renewable heat technologies.

i) Net present value

Options considered for the development of the renewable heat market, purely on the basis of monetised costs and benefits, have a negative net monetised cost benefit. This of course takes no account of non-monetised costs and benefits. This was also the case when the non domestic RHI was approved in 2012.

In monetised cost-benefit terms; however, the option selected for the domestic RHI is both the most preferable in terms of NPV and the most cost effective in terms of the cost of carbon saved. The NPV for the domestic RHI is calculated at £-56m.

In addition, the option selected is the most cost effective with it estimated that a tonne of carbon will be saved for £66.31. This compares to a tonne of carbon saved for £107.79 - £114.72 for other options. This also compares favourable in terms of the cost of offshore wind which is assessed at £80-90 per tonne of carbon saved.

j) **Affordability**

As previously stated, funding of £25m is available to 2015/16 for this scheme.
HMT have already indicated that any spending commitments made via the initial NI RHI (i.e. through the £25m) will be met by ongoing RHI payments from HMT.

DECC has secured £430m for the GB RHI for 2015/16. The DECC Minister has indicated to Minister Foster that the Barnett consequential of this funding should be forthcoming to Northern Ireland.

DETI Finance Branch has advised that DFP has indicated that AME budgets are formulated using the information provided in AME forecasting exercises, and there is no separate bidding process. Therefore, for RHI the current profile is £6.35m 2014/15, £9.5m 2015/16, £13.5m 2016/17, £18.5m 2017/18, £24.5m 2018/19 and £31.0m 2019/20.

Risks

A number of potential risks have been identified in the development and implementation of the domestic RHI. These are detailed in the Risk Register (attached at **Annex B)** along with proposed mitigating actions. Risks identified at this stage include;

- Incorrect subsidy set, either too high or too low;
- Lack of uptake;
- Harm to other sectors;
- Failure of renewable heat supply;
- Insufficient budget for administration or future payments;
- Failure to meet EU and Executive set targets;
- Inadequate resource to deliver project/separate key functions including staff
- Instances of Fraud
- Failure in Administration

These risks will be monitored and managed as part of the risk register, with additional risks added if required.

k) Legislation

The primary power to enable DETI to make regulations for schemes to encourage renewable heat was incorporated into the Energy Act 2011[2] which was given Royal Assent on 18 October 2011. Secondary legislation was laid in November 2012 for the non domestic scheme and is currently being drafted for the domestic RHI. The Domestic Renewable Heat Regulations will be laid through draft affirmative resolution procedure in the Assembly.

l) Approvals

A final business case for the domestic RHI will be submitted to DFP for approval once DETI Casework approval has been obtained and in parallel with seeking Ministerial approval.

m) Economists Comments

This business case has been considered by G7 economist within DETI Energy Division. He is content that this appraisal has been carried out in accordance with the NIGEAE guidance and that the approach adopted represents value for money and is the most effective way of

[2] http://www.legislation.gov.uk/ukpga/2011/16/part/3/crossheading/northern-ireland-renewable-heat-incentives

allocating resources provided by HMT for the purpose of incentivising domestic renewable heat installations.

Whilst there is a significant cost associated with this policy, it will reduce carbon emissions and facilitate the development of a renewable heat sector within Northern Ireland. This, in turn, will help Northern Ireland to achieve its 10% renewable heat target by 2020.

n) Next Steps

- The first step is to secure all necessary approvals and lay the secondary legislation.

- It is proposed that the domestic RHI will then commence as soon as possible and ideally early summer 2014. Once approvals have been obtained for the scheme, the first step will be to announce the closure of the RHPP scheme. Vouchers already issued under this scheme will remain valid for up to 6 months.

- The introduction of the domestic RHI will then be staggered with existing RHPP installations being migrated across prior to opening the scheme to new applicants.

Conclusion

The evidence shows that a RHI is required to incentivise the renewable heat market, in order to achieve an EU renewable energy target which necessitates NI producing 10% of its heat from renewable sources by 2020. The development of the renewable heat market locally will also support the energy goals contained in the Department's Strategic Energy Framework, specifically in regards to Northern Ireland's sustainability and energy security.

BUSINESS CASE FOR THE INTRODUCTION OF THE DOMESTIC RENEWABLE HEAT INCENTIVE

Prepared by Peter Hutchinson

Approved by: John Mills

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Background

This business case relates to policy proposals for the second phase of the Northern Ireland Renewable Heat Incentive (RHI), primarily relating to the domestic market.

The RHI scheme was launched in November 2012 as a measure to support the government's target of 10% of energy used for heating to come from renewable sources (from a 2010 baseline of 1.7%) in line with EU obligations and targets set in the Programme for Government and Strategic Energy Framework.

The RHI currently provides an ongoing financial incentive for non-domestic generators of renewable heat for the lifetime of the technology. A system of tariffs were introduced and payments made by multiplying the actual heat output by the relevant technology tariff. The tariffs are designed to ensure that the additional costs of the renewable technology are recovered and a rate of return of 12% applied. The domestic market was not included in the first phase of the RHI because of issues relating to measuring heat in this sector and the design of an appropriate tariff system.

Before the RHI scheme was introduced an economic appraisal was carried out, a public consultation held and a business case submitted and approved by DFP Supply. The scheme was also approved by the DETI Minister, the EU Commission (regarding State Aid guidelines) and a DETI Casework Committee. The proposals outlined within this business case are within the original funding envelope of Phase 1 of the scheme.

A similar scheme applies in Great Britain, however, with different tariff levels.

Phase 1 of the scheme was limited to the non-domestic sector and for well established technologies (biomass, ground source heat pumps and solar thermal). Phase 2 of the scheme is therefore intended to extend the scheme to the domestic sector and expand the list of technologies / applications incentivised in the non-domestic sector. These proposals have been developed in conjunction with external consultants and been subject to a public consultation process.

This phasing mirrors the approach taken in GB. A non-domestic RHI was launched in England, Scotland and Wales in November 2011 with the intention of extending the scheme to the domestic sector in due course. A domestic RHI will be introduced shortly in GB and changes to the commercial scheme planned for later in the year.

This business case has been informed by independent analysis carried out by Cambridge Economic Policy Associates (CEPA) and Ricardo-AEA. A copy of this report is attached at **Annex A**.

This business case seeks approval for areas relating to the domestic RHI only (the introduction of support for new technologies under the expansion of the non-domestic scheme will be dealt with separately in due course). There are two main areas;

1. The introduction of a domestic RHI for domestic properties in Northern Ireland;
2. The administration arrangements for this domestic scheme via the procurement of a bespoke system. (Whilst the procurement process is carried out in-house staff will administer the scheme).

The Strategic Context

The European requirement for renewable energy

1.1 Through the European Directive 2009/28/EC[1] (the Renewable Energy Directive) the EU has committed itself to sourcing **2**0% of its energy needs from renewable sources by 2020. The Directive requires Member States to achieve mandatory overall targets, but allows this to be achieved in any combination across three sectors:

- energy from renewable sources for heating and cooling;
- electricity from renewable energy sources; and
- energy from renewable sources in transport.

1.2 The UK's overall target is set at 15%. While the Government has not committed to a particular sector mix, the "lead scenario" in DECC's Renewable Energy Strategy[2] envisages the overall target being met through renewables fulfilling:

- 12% of heating and cooling needs;
- more than 30% of electricity demand (29% large and 2% small-scale electricity generation); and
- 10% of transport energy needs.

1.3 The Renewable Energy Directive is not directly binding on devolved administrations but renewable deployment in all regions contributes equally to the requirements placed on the UK under the Renewable Energy Directive and each region will be expected to implement a plan for delivery.

1.4 In September 2010, DETI committed to achieving a renewable heat target of 10%[3] by 2020 in its Strategic Energy Framework[4], subject to an economic appraisal and a decision on the best means of support.

1.5 While achieving the 2020 target will require a significant change in how our energy needs are met, it is only a small part of the way towards the target of reducing greenhouse gas emissions to 80% below 1990 levels by 2050, as required by the 2008 Climate Change Act.

The Northern Ireland Heat Market

1.6 The Northern Ireland heat market is almost wholly dependent on imported fossil fuels. This has obvious implications for fuel security and carbon

[1] Directive 2009/28/EC, on the promotion of the use of energy from renewable sources http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:EN:PDF
[2] DECC, July 2009, Renewable Energy Strategy, http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/res/res.aspx
[3] While this target is two percentage points below that for the UK as a whole, the Northern Ireland commitment to 40 percent renewable electricity generation is ten percentage points higher than DECC's commitment for the UK as a whole.
[4] DETI, 2010, A Strategic Framework for Northern Ireland, http://www.detini.gov.uk/deti-energy-index/deti-energystrategic-energy-framework.htm

emissions as well as meaning that Northern Ireland consumers are subject to global price fluctuations beyond the control of DETI or the NI Executive. The total heat demand in Northern Ireland has been estimated at 17,362 GWh per year, this compares to 668,000 GWh per year in the United Kingdom as a whole and 64,534 GWh per year in the Republic of Ireland. Of this total, only 1.7% or 300 GWh comes from renewable sources, with the majority from biomass boilers.

1.7 The main heating fuel in Northern Ireland is heating oil. Refined oil products account for around 77% of heat demand overall. This is a very different situation to Great Britain where the natural gas market is prevalent and accounts for 68.8% of heating demand with heating oil only accounting for 10%. The natural gas market in Northern Ireland is still developing and therefore only accounts for 17% of overall demand. The remaining heat demand in Northern Ireland is met by electricity or *Economy 7* (1.2%), coal (3.2%) and renewables (1.7%)[5].

Fuel / Energy type	**Domestic (GWh)**	**Industrial, Commercial and Public (GWh)**	**Total (GWh)**	**Percentage of total**
Oil	9,241	4,103	13,444	77%
Gas	973	1,991	2,964	17%
Economy 7 Electricity	176	41	217	1.2%
Renewables	No information on split		290	1.7%
Coal	110	438	547	3.1%
Total			**17,362**	

1.8 Looking towards 2020, analysis undertaken[6] indicates that Northern Ireland's overall heat demand is predicted to fall from 17.4 TWh per year to 16.7 TWh with rises in demand from new development being outweighed by reductions in demand and energy efficiency improvements.

Sector	**2010 heat demand (GWh)**	**Additional heat demand by 2020 (GWh)**	**Reduction in heat demand through energy efficiency (GWh)**	**Net 2020 heat demand (GWh)**
Domestic	10,644	621	1,048	10,217
Commercial	2,148	97	189	2,056
Industrial (EU-	3,828	274	382	3,720

[5] Study into the potential development of the renewable heat market in Northern Ireland, AECOM Ltd and Pöyry Energy Consulting, 2010

[6] Study into the potential development of the renewable heat market in Northern Ireland, AECOM Ltd and Pöyry Energy Consulting, 2010

ETS sites)				
Public (not housing)	742	34	65	711
TOTAL	**17,362**	**1,026**	**1,684**	**16,704**

The domestic market and the Renewable Heat Premium Payment (RHPP)

1.9 The domestic sector represents the largest heat demand for Northern Ireland at 61% of the total demand; this is higher than the total UK figure of 55% heat demand for domestic heating. Around 3,828 GWh or 22% of Northern Ireland's heat demand is accounted for by large industrial users, defined as those covered by the European Union Emissions Trading Scheme (EU-ETS), of which there are only 17 sites[7]. The commercial sector and public sector account for 12% and 4% of the total demand respectively. The heating demand by sector is detailed below.

Sector	**Heat demand (GWh)**	**% total**
Domestic	10,644	61%
Commercial	2,148	12%
Industrial (EU-ETS sites)	3,828	22%
Public (not housing)	742	4%
TOTAL	**17,362**	**100%**

1.10 As the RHI, when launched in November 2012, did not cover the domestic market DETI put in place an interim scheme called the Renewable Heat Premium Payment (RHPP) that provided up-front support for domestic consumers wishing to install a renewable heat technology. Domestic households were not included in Phase 1 of the RHI as further analysis was required on the appropriate method of incentivisation and administration.

1.11 The RHPP launched in May 2012 and provided support ranging from £320 - £3500 depending on the technology installed. The scheme was administered by DETI.

[7] DETI understands that only 16 of these sites may now be operating however for the purposes of the original analysis it was assumed that all 17 were in operation.

1.12 The performance of the scheme (at 07/05/14) is detailed below;

Technology	Applications		Vouchers redeemed	
Air Source Heat Pump	194	12%	96	10%
Biomass	816	50%	429	45%
Ground Source Heat Pump	150	9%	98	10%
Solar Thermal	477	29%	326	35%
Totals	1637		949	

1.13 As at 07/05/14, DETI had supported 797 technologies at a cost of £1.44m.The total capacity of the new renewable heat technologies is in the order of 13.9 MW.

1.14 The scheme was launched as an interim measure before a domestic RHI scheme could be designed, appraised and implemented. When launching the RHPP it was made clear that applicants would remain eligible to apply for a domestic RHI scheme when in place. This was in line with proposals in GB where a RHPP scheme was launched in 31 March 2012 and the domestic RHI came into effect on 8 April 2014.

Targets for Renewable Heat

1.15 In 2010, the DETI Minister committed the Department to achieving a level of 10% renewable heat by 2020. This target is included in the Strategic Energy Framework. An interim target of 4% by 2015 is included in the Programme for Government.

1.16 Taking into account the 300 GWh of renewable heat already present in Northern Ireland, a target of 10% for 2020 equates to an additional 1300 GWh of renewable heat. The 4% target equates to roughly an additional 385 GWh (assuming a heat demand of around 17.1 TWh in 2015).

1.17 These are challenging targets, in order to demonstrate the scale it is useful to note that for 10% renewable heat to be achieved solely through installations within the domestic sector; around 16% of the existing housing stock would be required to switch to renewable heat technologies. This would mean modifying around 11,800 homes per year. .This is far in excess of the current uptake of the RHPP. It is estimated currently that around 7% of boilers are replaced on a yearly basis.

1.18 The total heat capacity incentivised under the RHPP and the RHI to date is 31MW. In addition, DETI is aware of a large renewable combined heat and power plant to be commissioned in the North West in 2015 that will contribute a further 8.3MW of heat capacity. Accounting for this planned development, the installations incentivised to date by DETI and existing renewable pre 2010 the estimated current level of renewable heat is estimated at around 2.5%.

The GB RHI

1.19 The non-domestic RHI scheme has been in place in England, Scotland and Wales since November 2011. The scheme has many similarities to the NI scheme however the tariffs in GB tend to be higher than those offered in NI; this is largely due to the fact that it is assumed that GB consumers will be switching to renewables from natural gas, whereas NI consumers are moving from oil. As oil is more expensive there is less of a gap in terms of the costs of switching to renewables and therefore less incentive is required.

1.20 Northern Ireland was not included in the GB RHI scheme as it was not covered by the primary legislation that underpinned the scheme. Also as the energy markets are very different in GB and NI it was determined that a separate approach be taken.

1.21 DECC has made clear plans to introduce a domestic RHI scheme in England, Scotland and Wales from March 2014. The tariffs will be paid for 7 years and those who availed of the RHPP in GB remain eligible to apply. By introducing a similar scheme in NI, DETI would be ensuring there is parity and equality of opportunity for consumers.

The need for expenditure

Key drivers

2.1 The two key drivers at a European level are the need to reduce greenhouse gas emissions and the binding targets for renewable energy imposed on each European Member State.

2.2 There are other drivers for renewable heat which relate to security and diversity of energy supply. Northern Ireland is highly dependent on imported oil for heating (and to a lesser extent imported gas). Increasing the proportion of renewable heat will lessen this dependence. While there will be some increase in dependence on imported biomass, the increased diversity of fuel supply should improve security.

2.3 An additional consideration, and risk associated with limited DETI intervention, is the fact that GB is already in the process of introducing long term support for the domestic sector. If DETI were not to do likewise in NI, there would be significant public disapproval, arguments of disadvantage and the benefits associated with renewable heat that are available in GB, would not be recognised in NI.

Need for a specific approach

2.4 The heat market in Northern Ireland is very different to the market in GB. Northern Ireland is largely dependent on oil with a developing natural gas market, whereas in GB the gas market is well established and is the predominant fuel source.

2.5 There are also differences in fuel prices between GB and Northern Ireland and the amount of our income that goes towards heating our homes and businesses, as a consequence the levels of fuel poverty tend to be higher. Finally, the geography of Northern Ireland is very different to GB, with Northern Ireland being more rural with fewer larger cities and therefore has a very different heat density. These factors meant that it was appropriate for a separate scheme to be introduced in Northern Ireland to specifically incentivise the local market.

Failure to meet 10% target

2.6 The 10% renewable heat target is included in the Strategic Energy Framework, with an interim target of 4% by 2015 included in the Programme for Government. The achievement of these targets will contribute to wider energy goals of increased security of supply, reduced carbon emissions and opportunities for ‘green jobs’.

2.7 The failure to achieve the target could ultimately lead to the UK as a whole failing to meet targets set under the RED. Whilst Northern Ireland is not a

member state of the EU it is expected to contribute to UK targets. The failure of the UK to meet RED targets would lead to infraction fines that would be apportioned by DECC on those administrations that have not contributed to the target. In addition, failure to achieve these public targets would lead to criticism of DETI by stakeholders. DETI must therefore demonstrate that levels of renewable heat have increased significantly by 2020.

Need to support the domestic sector

2.8 The domestic sector is the largest sector in terms of heat demand and therefore for the target to be met and for renewable heat to become a well-established and understood form of heating it is important that domestic applications are supported as well as commercial applications.

2.9 The domestic sector also faces the biggest barriers in terms of up-front capital cost in relation to renewable heat and therefore Government intervention is required to encourage domestic customers to switch to renewable technologies. Renewable heating solutions (such as community heating) could provide opportunities for more efficient heating systems and lower heating bills.

2.10 In addition, the Minister has previously committed the Department to introducing a domestic RHI scheme and those availing of the RHPP scheme have done so on the basis that they would remain eligible to apply for the ongoing incentive when it became available. Not introducing the scheme would go against this commitment.

Need for appropriate administration arrangements

2.11 For any scheme to be successful it will be imperative to have appropriate administration arrangements in place. Given the potential complexities in awarding money for renewable heat output and the deeming of certain technologies eligible and ineligible, these systems will need to be robust, fully tested and fit-for-purpose. Without appropriate administration arrangements and systems to manage applications and accreditation the scheme would be unsuccessful.

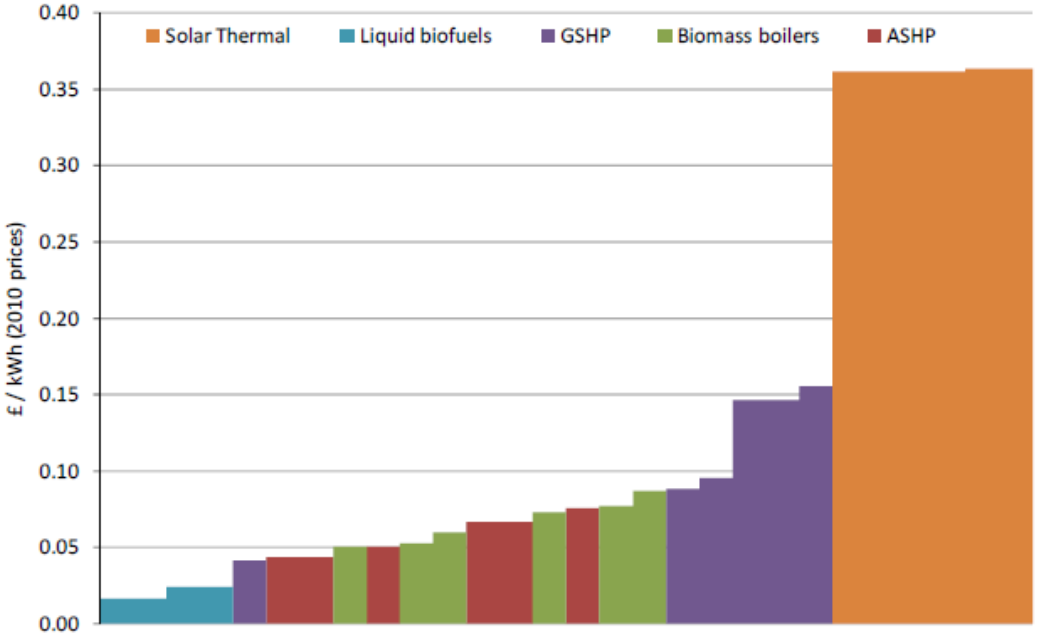
2.12 It could be expected that the administrators would have to cope with in excess of 1200 applications per year. As payments continue for a number of years, in 2020 the administrators would be dealing with over 10,000 accredited installations.

Cost of renewable heating technologies

2.13 The 2010 level of renewable heat in Northern Ireland was estimated at 1.7% of total heat demand; this was broadly in line with GB levels (1.5-2%) but lower than existing levels in the Republic of Ireland (4%) where there was a history of grants/incentives.

2.14 A major contributory factor to the historical lack of uptake in comparison to other heating technologies (oil at 77% or gas at 17%) is the large upfront capital cost of the technologies. Depending on the type of technology and the application (domestic, commercial or industrial) the capital cost of the renewable heat technology can be over 5 times that of the alternative.

2.15 The graph below demonstrates the cost differential in the domestic sector by detailing the levelised cost of renewable heat in comparison to conventional oil heating i.e. comparing the counterfactual (oil) with renewable heating. In essence showing how much more expensive renewable heat is compared to oil when considering the cost of a single unit of heat over the lifetime.



2.16 Given the differences in cost of renewables in comparison to existing fossil fuel systems it is difficult to foresee how the required level of deployment could be achieved without financial incentives.

Current status of the heat market in Northern Ireland

2.17 Currently, the Northern Ireland heating market is almost completely reliant on imported fossil fuels, with only 1.7% of demand being met by indigenous renewable sources. In addition, one fuel source is dominant within the heating market with oil meeting over 75% of overall heating demand. This leaves Northern Ireland consumers vulnerable to price fluctuations outside of its control and has led to higher levels of fuel poverty in comparison to other UK regions. This is especially true in areas outside the gas network where there is reduced choice in terms of fuel supply.

2.18 The further development of the renewable heat market will ensure a more diverse, sustainable and secure heat market with significant opportunities for reduced carbon emissions and 'green jobs'. In addition, the growth of

renewable heat will provide greater choice for consumers that are currently on solid fossil fuel.

The objectives and constraints

Objectives

3.1 The overall objective is to deliver the target of 10% renewable heat by 2020, but this has to be delivered in a way that is consistent with other DETI policies and objectives and presents value for money.

3.2 Listed below are directional objectives and expected outcomes.

Primary Objective		
Area	***Direction***	***Interim target for 2015***
Levels of renewable heat	Increase uptake of renewable heat to 10% of market share	Reach 4% market share
Secondary Objectives		
Area	***Direction***	***Interim target for 2015[8]***
Carbon emissions	Reduce emissions against counterfactual	Emissions reduced by 40,000 tonnes
Oil imports	Reduce oil imports against counterfactual	Imports reduced by 50,000 barrels
Gas use	Minimal reduction against counterfactual	No reduction against current projections

3.3 All these objectives will be achieved to the greatest extent when renewable heat displaces oil, rather than current or future gas consumption. This is clearly true for the oil imports and gas use objectives, and is true for the carbon emissions objective because oil produces more carbon dioxide per unit than gas.

3.4 In addition, supporting the domestic sector in this way has the added benefit of increasing consumer choice in terms of heating supplier. This is especially true of areas of Northern Ireland with no access to natural gas. Also, whilst the up-front capital costs of these technologies are higher than fossil fuel the ongoing costs tend to be lower, therefore consumers have more affordable energy bills once the up-front costs are covered.

[8] Based on the expected levels under the recommended policy option, rounded to one significant digit. These figures should only be taken as indicative rather than as firm targets, and as inputs to the first review of any RHI.

Constraints

Scheme funding

3.5 The appropriate RHI for NI must be developed with the available funding in mind. At present, DETI has secured £25m from the Treasury for renewable heat promotion. The money is allocated for the period 2011/12-2014/15 and cannot be used for any other purpose than renewable heat in Northern Ireland.

3.6 Communications between DETI, DECC Finance Team and HM Treasury indicates that that funding beyond 2014/15 will be available for those installations that are installed within the Spending Review period (i.e. up to 2014/15).

3.7 DECC has secured £430m for the GB RHI for 2015/16. DECC Minister Gregory Barker indicated to Minister Foster in a letter dated 7th February 2014 that the Barnett consequentials of this funding should be forthcoming to Northern Ireland however this is yet to be confirmed by DFP. It could be estimated that this funding would be in the order of £10.8m – 12.9m.

3.8 The relative populations of NI and GB (1.8m [9]and 60m[10] respectively, in mid 2009) were applied to the figures in Table 5 of the GB RHI Impact Assessment[11], which shows a present value of subsidy to 2020 of £5.4 billion, and a lifetime present value of subsidy of £22 billion. Pro-rating these by the respective population sizes, gives corresponding subsidy figures for NI of £162m and £660m respectively.

3.9 The GB impact assessment also demonstrates an expected subsidy costs of £1.4 billion in 2020, NI's pro rata share of this expected subsidy would be £42m. The policies relating to the RHI have therefore been developed using a funding constraint of £42m in 2020 and it is expected that the funding levels will not be exceeded.

Skills

3.10 The renewable heat sector is still an emerging market and therefore appropriate skills in terms of supply and installation of technologies are still in being developed.

3.11 Under the RHPP 51 different installers have been responsible for a least one installation. This is in excess of the 26 Microgeneration Certification Scheme (MCS) installers that were certified in Northern Ireland in March 2011 and demonstrates a significant increase in the skills capacity in the sector.

[9] Source: NI Statistics and Research Agency.
[10] National Statistics figure for UK, less figure given above for Northern Ireland.
[11] DECC, 2011, Impact Assessment for Renewable Heat Incentive, http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Renewable%20energy/policy/renewableheat/1381-renewable-heat-incentive-ia.pdf

However, more installers and suppliers will be required if confidence in this sector is to increase and if the required levels of uptake satisfied.

Market knowledge

3.12 A significant constraint on achieving the set objectives and securing sufficient levels of deployment is consumer's attitudes towards renewable heat technologies. There remains a general lack of awareness amongst consumers about the reality of renewable energy technologies and how they could be deployed in householders. Renewable heat technologies are less well established or understood than renewable electricity technologies that have received Government subsidy since 2004.

3.13 This lack awareness is somewhat demonstrated by the fact that whilst the RHPP has received 1650 applications since May 2012, the boiler scrappage scheme (for replacement fossil fuel systems) run by DSD has received in excess of 10,000 applications in a shorter time period. This is despite the fact that the RHPP grants are higher than those offered by DSD. In addition, Bryson Energy offered 400 homes the chance for either a new oil boiler or a new biomass boiler free of charge. Only 8 houses selected biomass ahead of oil, despite it being explained that biomass fuel was cheaper than oil. This highlights that consumers remain committed to installing fossil fuel technologies despite the benefits of renewable alternatives. This places a constraint on the level of uptake.

Access to finance

3.14 A contributory factor to the lack of uptake in comparison to the fossil fuel systems detailed above is the lack of capital finance for the costs of the system. Despite the domestic RHI designed to provide sufficient incentive to cover all the additional costs incurred in installing and running renewable systems there still remains a significant capital outlay at the beginning of the project. For primary heat technologies this can range between £6000 (small air source heat pump or small biomass) to £12000+ (large ground source heat pump or biomass).

3.15 Therefore without appropriate access to finance, either through savings or loans, the level of uptake could be significantly constrained. The table below sourced from the 2010/11 NI Family resources survey[12] demonstrates the level of Northern Ireland household savings.

Amount of savings and investments	% households
No savings	52
Less than £1,500	10
£1,500 but less than £3,000	9
£3,000 but less than £8,000	13
£8,000 but less than £10,000	2

[12] http://www.dsdni.gov.uk/frs_2010-11.pdf

£10,000 but less than £16,000	4
£16,000 but less than £20,000	2
£20,000 or more	8
Total	100

3.16 Based on the table above, it can be estimated that less than 28% of the population would have adequate savings to install a renewable heat technology in their home.

Options

4.1 In developing the structure for the support a number of different options were considered for both the level/nature of support and the means of administering the scheme.

Option 1 - No support given.

4.2 In line with a 'do nothing' option considered in other appraisals it was questioned whether it was actually necessary to provide any support at all to domestic consumers wishing to install renewable heat. From a policy perspective it would be difficult to exclude the domestic sector from incentives given previous Ministerial commitments on the matter.

4.3 In addition, the development of the renewable heat sector is intended to give consumers greater choice over energy issues, not providing support in this sector would leave many domestic consumers with no choice other than home heating oil or coal. Finally, analysis demonstrated that the costs of renewable heat, especially in the microgeneration sector, meant that without financial incentives the level of uptake would be insufficient to achieve the targets of 4% by 2015 and 10% by 2020 in line with Executive commitments.

Option 2 - Full expected technology life support.

4.4 This would be a system akin to the existing commercial RHI whereby the tariff is set to provide support over the full lifetime of the technology (maximum of 20 years). Whilst this is the design of the commercial RHI it might be less well suited to the domestic market as homeowners tend to move house with greater frequency that businesses might change premises (or at least the transfer of an asset, such as the RHI, may be more straightforward in the commercial sector). In addition, introducing an asset life support mechanism would require administrative procedures to be in place until 2040/41.

Option 3 - Support upfront as a grant

4.5 This option would be to award single payments made on the installation of the technology. Grants have the benefit of overcoming capital constraints faced by households with limited savings. While over the lifetime of the boiler, the household may receive net benefits once the subsidy is taken into account, the household cannot access these benefits if it cannot pay for the boiler to be installed.

4.6 On the other hand, grants can provide little incentive to select the most efficient technology or ensure optimum installation and on-going operation. If the grants are awarded solely for the installation of renewable technologies, rather than the generation of renewable energy (which is the ultimate aim of the support mechanism) second best technologies could be promoted which could also be more expensive than oil or gas. Policies which provide long term incentives for the use of renewable heat may also be more effective in

giving long term signals to the renewable heat market, and preventing a "boom and bust" outcome, for example experience of previous grant schemes was that the market was very busy but then stopped as soon as grant ended, leading to little ongoing benefit. Also anecdotal experience showed prices of systems went up in line with grant support.

4.7 In addition, from a subsidy supply-side perspective, an upfront grant scheme puts pressure on short-term government budgets and thus may constrain the scale of support that can be offered in the short-term.

Option 4 - Seven-year flat tariff support

4.8 This is the approach to be implemented by DECC under the GB domestic RHI, whereby the total required subsidy is paid out in equal increments over 7 years (rather than 20 years under the commercial scheme. DECC consulted on 20-year tariffs in 2010 but concluded that this was too long.

4.9 Following this, DECC modelled options for five-year, seven-year and ten-year tariff schemes and selected seven-year tariffs as their lead option. This was based on DECC's view that seven years offers a good balance between government and consumer perspectives, in that it favours cost reduction (compared to a 20 year tariff), risk reduction and short term affordability. The cost reduction point arises because the longer the tariff lifetime, the more expensive it is for Government to provide a subsidy that will incentivise renewable heat. Seven year tariffs also ensure the incentivised technology remains in place until at least 2020 and therefore contributes towards the target. A shorter tariff length (3-5 years) raises the risk that consumers discard the renewable technology before 2020. This risk is particularly pertinent in Northern Ireland where by 2020 more consumers will have a new heating option in the form of natural gas.

Option 5 - Combination of RHPP level support and on-going payments for 7 years

4.10 Another option considered was where we provide an initial payment equal to the current RHPP payment, plus an ongoing payment per kWh for seven years. The RHPP values have proven successful in removing the initial cost barrier for some consumers however uptake is still below the required level to achieve the set targets. By retaining this level of support and introducing ongoing payments for the operation, maintanence and use of the technology, it is expected more consumers will be able to avail of renewable heat.

4.11 The analysis from CEPA shows that the net present value of the payments is the same as for all other domestic options. The level of support is calculated by determining the difference in cost between the counterfactual fossil fuel system and the renewable technology and paying this amount as a pence per kilo watt hour figure. Therefore each option pays the same amount to the consumer in net present value terms. By offering an element of support up front and an ongoing tariff there is the benefit of reducing some of the upfront

barriers for consumers in terms of capital costs, hassle costs and potential finance costs, as well as providing an ongoing incentive to ensure use and spread Government costs.

Option 6 - Combination of varying grant plus ongoing payments for either 7 or 20 years.

4.11 A final option developed was to adjust the profile of the subsidy depending on the technology to align with that specific technology. For instance, some technologies might be more expensive up front but cheaper to operate, therefore an initial payment would be more important than an ongoing tariff. On the other hand a technology could be cheaper to install but more expensive to run, therefore no upfront payment would be required but a tariff to aid with operating costs would be vital. The type of subsidy would therefore differ depending on the technology, as per table below.

		Upfront cost	
		Lower	**Higher**
Ongoing cost	**Lower**	No subsidy	Upfront grant
	Higher	Annual payment	Upfront and annual payments

4.12 Based on the technologies proposed to be supported under the domestic RHI the following subsidy profiles would be required.

		Upfront cost	
		Lower	**Higher**
Ongoing cost	**Lower**	<u>No subsidy</u> None	<u>Upfront grant</u> Solar thermal Ground Source Heat Pump Air Source Heat Pump Biomass chip boilers
	Higher	<u>Annual payment</u> None	<u>Upfront and annual payments</u> Biomass pellet boilers Bioliquid boilers

Calculated rates

4.10 The calculated rates for each of the potential tariff structure options are detailed below, along with the confirmed rates for the equivalent GB scheme (paid over 7 years).

4.11 The basic premise is the appropriate tariff is calculated for the asset life i.e. how much more expensive is the renewable compared to oil. Then for options that have grant or 7 yr (or both) the appropriate tariff is calculated to ensure that the same level of subsidy is paid (npv) as that under the asset life tariff. DECC's approach is to pay 20 yr of subsidy over 7 yr. Our approach is similar but we provide an element straight away – this is deducted from ongoing tariff.

Technology		Tariff structure								DECC figures for GB RHI (p/kWh)
		Option 2	Option 3	Option 4	Option 5		Option 6			
					RHPP plus 7 year		Upfront plus ongoing			
		Asset life (20 year) (p/kWh)	Upfront grant (p/kWh)	Flat 7 year (p/kWh)	Initial payment[13] (£)	Ongoing (p/kWh)	Upfront payment (p/kWh in year 1)	Ongoing asset life tariff (p/kWh)	Ongoing seven year tariff (p/kWh)	
Solar Thermal	Calculated	26.04	285.38	50.12	320	13.05	285.38	-	-	19.2
	Cap[14]	8.54	93.54	16.43			93.54	-	-	
Biomass boiler		4.08	44.75	7.86	2500	5.53	28.95	1.44	2.77	12.2
Bioliquids		1.97	18.66	3.28	500	2.7	12.11	0.69	1.15	n/a
Ground Source Heat Pump		6.73	73.76	12.96	3500	8.04	73.76	-	-	18.8
Air to Water Heat Pump		4.22	46.27	8.13	1700	3.44	46.27	-	-	7.3

[13] These upfront payments are set in line with the support offered under the RHPP; this makes the scheme administratively simple in that RHPP applicants receive the ongoing tariff only. For bioliquids, where no RHPP has been provided, up front support of £500 has been proposed.
[14] In line with the non-domestic RHI calculations for solar thermal, a cap is placed on more expensive technologies at 17.3p/kWh for the seven year tariff.

4.12 The tariff values for each option have been calculated to provide the same net present value of subsidy (at an assumed discount rate of 7.5%). Therefore no particular option should be seen as providing more or less "incentive" to a household on this basis alone.

4.13 In essence the lifetime tariff is calculated, this is the figure that demonstrates how much more expensive the renewable technology is in comparison to the fossil fuel counterfactual over the lifetime of the technology. The subsidy to be paid to the consumer addresses this additional cost. When calculating tariffs that are for a shorter time period, include an element of initial support or both, the overall subsidy remains the same in NPV terms.

Administration

4.14 No matter what funding support option is selected in terms of policy an appropriate administration system will be required. The administrator will be responsible for receiving applications, enforcing eligibility standards, making payments and monitoring compliance. There are a number of potential options for administration.

In house administration

4.15 The RHPP scheme is currently administered within Renewable Heat Branch. This process involves receiving applications, advising on eligibility, carrying out site visits and making payments. The day to day running of the scheme is carried out by 2 FTE EOII's with 2 DP's responsible for checking and authorising payments. The payments are made by Energy Division co-ordination branch. The administration arrangements are underpinned by a simple database system that records application details.

4.16 DETI could choose to run the domestic in-house with the existing team that administers the RHPP. The RHPP will terminate once the domestic RHI is finalised and therefore there would be no overlap in administration. However, the domestic RHI will be more complex to administer and will require more detailed information from applicants, a higher level of technical expertise and an ongoing relationship with applicants. It would therefore require a more robust record management system and an online application tool.

4.17 The benefit of in-house administration would be that it would allow an immediate start for the scheme and skills developed by staff during the RHPP could be utilised in the domestic RHI. This option would however require a significant update to the IT systems to allow additional information to be recorded, the relevant prompts for annual compliance checks / audits and the processes for annual payments. From speaking to colleagues within IT Branch, who have considered our requirements and have experience in similar cases, it is estimated that this IT update would cost in the region of £30-50k.

4.18 A significant risk with administering the scheme in-house is that if uptake exceeds expectations then additional staff could be required to provide additional administration support. Current uptake in the RHPP has averaged at 70 applications a month, with a high of 98. It is expected that interest in the scheme will increase as it is expanded into the domestic sector. However, there will be natural limits on the level of interest given the constraints discussed previously such as market knowledge and access to finance.

4.19 If interest in the scheme were to increase significantly (caused by greater understanding of renewables, a decrease in cost of renewables or an increase in cost of fossil fuels) then additional resources would be required to deal with demand.

External provider via competitive tender process

4.20 Another potential option for DETI would be to appoint an external service provider via a competitive tender process. This would ensure that a permanent administrator could be appointed and a new bespoke IT system developed specifically for the domestic NI RHI. Staff working on the RHPP would be in a position to work with the appointed service provider, sharing their knowledge and skills, to ensure the developed system was appropriate and fit for purpose. In addition, by awarding the contract via a competitive tender process DETI could be content that the market had been appropriately tested and that the contract was value for money.

4.21 The significant drawback with this approach is the length of time required to carry out the tender process and for the bespoke system to be developed. An optimistic estimate would be that this process would take between 6-9 months, however it could take longer. This would hold up the launch of the RHI, create uncertainty in the market, bring criticism upon the Department and Minister and could negatively impact on the achievement of the renewable heat target.

4.22 Ofgem currently administers both the GB and Northern Ireland non-domestic RHI schemes. The Northern Ireland contract was given to Ofgem as the most cost-effective method of administration to avail of synergies given the fact that they were administering the GB scheme.. However, if DETI were to procure a system to administer the domestic RHI consideration could also be given to extending the procurement to cover both RHI schemes. This could be used to assess whether Ofgem should continue to run the commercial scheme or whether another, more cost-effective, administrator could be appointed.

In house administration until an external provider can be appointed

4.23 A variation of the two previous options would be to put in temporary measures to administer the scheme within Renewable Heat Branch until a permanent external provider could be appointed. The benefit of this approach would that the existing staff and skills would be utilised in the short term to ensure the

scheme is administered effectively however the long term details, that require IT support, could be dealt with appropriately by an experience external service provider.

4.24 As already mentioned, the provision of an external provider will take time, both in terms of procurement and the development of appropriate systems and expertise. This could lead to the delay of the scheme. The branch is well placed to deliver the scheme in the short term but might not be able to commit to continuing the administration for the full time period (last payments in 2027/2028), especially if interest in the scheme exceeded current expectations. Also, some of the ongoing obligations may require technical expertise.

4.25 The short term delivery of the scheme in-house will allow the scheme to launch on time and should require minor IT revisions of the existing database. An assessment could then be made, based on uptake and on complexity of administration, as to whether an external provider should be procured and whether this procurement is solely for the domestic RHI or for the commercial scheme also.

Contract variation with Ofgem

4.26 As previously stated, DETI currently has a service level agreement in place with Ofgem (the GB energy regulator) to administer the non-domestic RHI. In addition, Ofgem will shortly be administering the domestic RHI in GB. Whilst the NI domestic RHI is different to both the non-domestic scheme and the GB domestic scheme, Ofgem would be well placed to learn from the two schemes to administer the NI domestic RHI. Ofgem could be given responsibility for the domestic RHI via a variation to the existing agreement and would be content to administer the scheme if asked. In terms of timing, Ofgem would require some time to scope and develop the appropriate administration requirements but could exploit synergies with the GB scheme where they existed. This option would certainly be more time-effective than a competitive tender.

4.27 Feedback from stakeholders regarding Ofgem's administration on the non-domestic scheme has been mixed and there have been difficulties encountered relating to the sharing of information and forecasting administration costs. In addition, experience from the RHPP is that domestic customers may require more information and therefore having a local presence has been helpful and would be helpful in the future domestic RHI. Finally, if the domestic RHI is to be administered by an external provider best practice would be to award the contract via competitive tender, this would not be an option for Ofgem.

Expected costs of administration

4.28 The expected costs / resources of each administration system are summarised in the table below.

Option	Staffing resources required	Potential costs	Benefits	Risks
1. In-house administration	Same staffing levels as currently in place for RHPP. This is primarily administered by 1 EOI and 1 EOII with input from 2 DPs and oversight from G7. Support from IT colleagues would also be required.	Costs would be minimal. If this option continued for a prolonged period of time (more than 12 months) it would need to cope with making annual payments. An external IT provider might be required to facilitate this with an estimated potential cost of £30k.	• Utilises existing staff and experience. • DETI retains control of standards. • Consumers deal with DETI directly. • Minimal costs. • Can be introduced quickly.	• High demand means existing team cannot administer scheme effectively. • Technical expertise may be required. • IT system not fit for purpose. • Data protection issues.
2. External Service Provider	The key internal element would be the staff time for procurement and ongoing management. Likely that this would be primarily led by DP with support from EOI and oversight from G7.	Costs would relate to an external provider developing IT systems and then administering the scheme. Development costs are estimated at £60k-100k and ongoing costs could range from £600 - £1500 per	• Bespoke system can be developed by experts. • Requirements such as technical support, site audits, payments can be dealt with by provider. • Competitive tender	• Long lead in time for procurement and development. • Necessary budget may not be secured. • Low uptake means system is obsolete.

Option	Staffing resources required	Potential costs	Benefits	Risks
		application. Exact costs would not be known until procurement exercise.	would allow the best priced system to be developed.	
3. In-house as interim measure whilst an External Service Provider is appointed	The resource required will be similar to the options 1 and 2.	No additional costs in short term then as per Option 2. If this options continued for a prolonged period of time (more than 12 months) it would need to cope with making annual payments. An external IT provider might be required to facilitate this with an estimated potential cost of £30k.	• Scheme can go ahead immediately whilst experts are procured. • Internal resource / expertise utilised. • Existing customers deal with same admin team. • Lessons learned from early operations can be fed back to procured provider.	• Team would need to remain in place until procurement exercise complete (lengthy process). • Necessary budget may not be secured. • Low uptake means system is obsolete.
4. Contract variation with Ofgem	The key internal element would be the management of the ongoing relationship with Ofgem. From experience, this would involve G7 and DP time and some oversight from G5.	Ofgem would require a feasibility study to be carried out to explore how their existing systems could be utilised to administer the scheme. There would then be development costs and ongoing operating costs. Experience from the commercial RHI would	• Experience of administering GB system utilised. • Track record of delivery. • Shorter lead in time compared to competitive tender.	• Differences in NI and GB scheme could lead to confusion in operations (as experience in commercial scheme). • Previous experience of lack

Option	Staffing resources required	Potential costs	Benefits	Risks
		suggest that the cost of the feasibility study would range between £40-60k, development costs in excess of £100k and ongoing costs at 3% of the GB scheme. The current admin cost per application under the commercial scheme is in the region of £1800.		of information shared and difficulty in budget management. • DETI would not know if this was best value as no competitive tender process.

High level option selection

Policy option selection

5.1 In selecting the preferred policy option a number of considerations were made, these included;

- Amount of renewable heat delivered in GWh to 2020.
- Cost-effectiveness of the policy in terms of £ per tonne of carbon saved.
- Ease of administration.
- Views of stakeholders.

5.2 In terms of the amount of heat delivered, the costs / benefits of each option and the cost-effectiveness, the following table outlines the high – level results.

		Renewable heat delivered (with capital constraint applied)	Renewable heat delivered (without capital constraint applied)	Quantifiable benefits (£m, present value to 2040)	Quantifiable costs (£m, present value to 2040)	Benefits / Cost (£m, present value to 2040)	Cost-effectiveness (£ per tonne of carbon saved)
Option 1	**Do nothing**	726 GWh[15]	735 GWh	-	-	-	£30.30
Option 2	**Asset life tariff**	726 GWh	1084 GWh	-	-	-	-
Option 3	**Upfront grant**	983 GWh	983 GWh	£22m	£148m	£-127m	£107.79
Option 4	**Flat 7 year tariff**	726 GWh	1021 GWh	-	-	-	-
Option 5	**RHPP plus 7 year**	858 GWh	969 GWh	£36m	£92m	-£56m	£66.31
Option 6	**Grant + lifetime tariff**	994 GWh	994 GWh	£22m	£161m	-£140m	£114.72
	Grant + 7 year tariff	990 GWh	990 GWh	£22m	£155m	-£133m	£111.36

5.3 This analysis suggests the lifetime tariff (option 2) performs best in that 1084GWh of renewable could be delivered by 2020; however this is without any constraint on household spending. When it is assumed that household spending is constrained the options without any upfront support perform badly. These options (2 and 4) do not provide any additional renewable heat by 2020 under a financial constraint assumption. This is because these options do not address the barrier of the upfront cost to households, and the tariffs won't be able to incentivise them to install renewable heating. Only the options with initial support elements can start to break the barrier, increase deployment and provide additional renewable resource.

5.4 The options that include an element of grant all deliver additional renewable heat resource by 2020, the most heat being delivered by option 6 where a varying level of grant and ongoing tariff for 20 years is provided. The least additional renewable heat is delivered by option 5 where a set level of grant is

[15] This "do nothing" figure includes domestic and non-domestic installations.

provided and tariffs for 7 years. However, option 5 is the both the least costly overall and the most cost effective in terms of £ per tonne/CO_2. The net present cost of this policy option is £56m to 2040, compared to a range of £127m - £140m for the other options. In addition, when we assess the cost effectiveness of the policy by determining the cost of the carbon saved by the policy, option 5 is the most cost-effective.

5.5 In terms of ease of administration, the options involving either grant or a reduced tariff length are more favourable than the 20 year tariff for the simple fact that there is less administration. A 20 year tariff (as outlined in option 2) would require an administrator to be in place until 2040/41. This adds significant cost and complexity to the scheme. In addition, a fixed level of grant would be more easily administered than an option where the level of grant varies depending on the technology and the application. Therefore option 5 is the most preferable in terms of administration.

5.6 A public consultation on the proposals was held between July – October 2013. Whilst option 5 was proposed as the preferred option stakeholders were asked their views on other potential options. The consultation received 50 responses, with the vast majority preferring an incentive system that paid tariffs over 7 years but included an element of initial support.

Preferred option - Rationale

5.7 The preferred option is therefore option 5.

5.8 The 7 year tariff structure is appropriate insofar as it reduces the concerns of homeowners who wish to install technologies but would be put off if they planned to move home within the next 5-10 years. It also ensures that technologies supported under the scheme will still be supported by 2020 and therefore guaranteed to be in place and contribute to the renewable heat target.

5.9 By setting a shorter tariff term (than the proposed 7 year term) there would be a risk that, once the support ended, consumers may choose to revert to fossil fuels if fuel prices at that time meant this would be a favourable option. This is of particular concern in Northern Ireland where large numbers of domestic customers will have access to new energy source, natural gas, by 2020 that do not currently have so. On the other hand tariffs longer than 7 yrs creates the risk that consumers are put off by the seemingly long pay back and unsure whether to invest in a home that they may subsequently sell. Therefore the 7 year tariff is proposed. This is in line with GB.

5.10 This proposal includes up-front support for new installations at the level set under the RHPP. The experience of the RHPP has demonstrated that up-front capital support is important for technologies that remain expensive to purchase and install. DETI is conscious that the capital outlay involved in renewable heat installations could remain to be significant barrier to deployment, as detailed in the section on *Constraints*.

5.11 The capital element of the proposed support mechanism will increase the accessibility and reduce the costs of any financing required. The proposed set figure of support remains in line with the grant already available under the RHPP – this level of support has proven to be attractive for investors and has created a high level of interest. Using these figures also simplifies the administration arrangements for those who have already received the grant. For bioliquids, where no RHPP support has previously been offered, initial support of £500 is proposed.

Administration

5.12 On balance, it is proposed that the domestic RHI is initially administered within Renewable Heat Branch whilst the need for an external service provider (appointed via a competitive tender process) is assessed, This approach has the benefit of an immediate start date for the scheme and will utilise the skills and expertise within the branch. To ensure this can happen some minor IT requirements are needed and new guidance documentation will be developed. Having the scheme administered by DETI in the first instance will ensure consistency with the RHPP.

5.13 An assessment will be made on the future administration arrangements will be made in the first 3 months of the “live” scheme. Energy Division will assess uptake in the scheme, the level of interest / inquiries and the complexity of queries. If it is determined that the available resource will not be able to fully fulfil the role of administrator a competitive tender process will be launched, in conjunction with CPD, once all necessary documentation is prepared and approved.

5.14 This competition could include the option of the administration of the commercial RHI contract also. For example, service providers could be asked to provide expected costs for i) administering the domestic RHI and ii) administering the domestic and commercial RHI schemes. This would ensure an informed decision could be taken on the most appropriate and best value for money approach. The appointment of an external provider would ensure there was a permanent administrative solution and a bespoke IT system for applications and payments.

5.15 If uptake in the domestic RHI remained in line with RHPP numbers and therefore could be dealt with in-house consideration would be given to whether specific support was required in terms of IT service for payments or technical energy support.

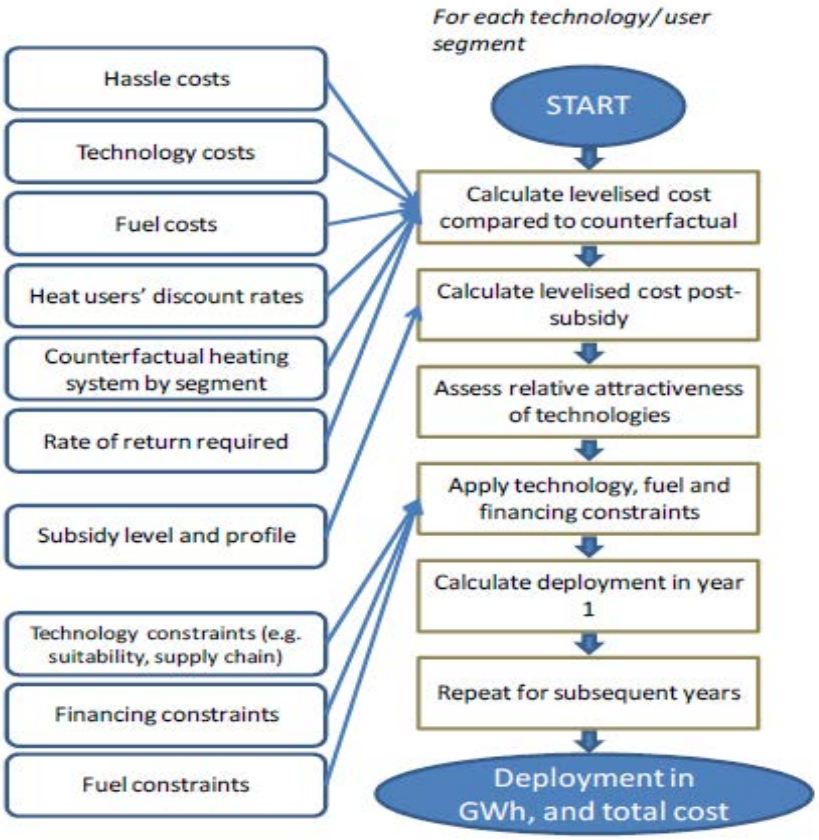
5.16 The permanent administration arrangements for the domestic RHI will be subject to a separate business case approval in due course.

Quantify the monetary costs and benefits

Economic Model

6.1 In order to assess the impact of any subsidies on consumer decisions, CEPA and Ricardo AEA developed a detailed economic model. This model considers the expected impact of different levels and profiles of subsidy on consumers' decisions about heating. It incorporates constraints such as on deployment and the availability of resources such as bioliquids, and looks at consumers at a relatively granular level, to capture the differences between, for example, rural and urban domestic consumers.

6.2 The model outputs profile the expected uptake of renewable heat, by customer segment, and looks at the displacement of oil and gas that this implies. Carbon and oil savings are also calculated, with carbon savings being monetised. The model outputs form the basis of our quantitative assessment of the options and of our cost-benefit analysis (CBA). The schematic below details all of the inputs that are considered within the model.



Monetary Costs and Benefits

6.3 It is assumed by CEPA that without any additional support in either the domestic sector or the commercial sector that around 726GWh of renewable heat will be deployed by 2020. This represents the level of cost-effective

renewable heating that could go ahead by 2020 without any Government subsidy This is well short of the assumed level of 1600GWh that is required to achieve the 10% target.

6.4 Based on current experience and trends, this figure of 726GWh for the "do nothing" appears optimistic. DETI has supported commercial and domestic renewable heat since May 2012 and since then it is estimated that around 60-80GWh has been incentivised. That means, currently, there is around 360-380GWh deployed. It is therefore perhaps optimistic to think that this figure could be doubled by 2020 without any new means of support.

6.5 The preferred option of a grant (based at the level of the RHPP) plus an ongoing tariff for 7 years has been determined as the most cost-effective option. The modelling suggests that this option will assist in delivering 858GWh of renewable heat in 2020 at a cost of £92m, present value to 2040. The quantifiable benefits are calculated at £36m, present value to 2040. The quantifiable benefits relate to the value of carbon emissions. There might be further benefits in terms of investment in the renewable heat sector, for example for every £1 spent under the RHPP it has generated £3.21 for suppliers and installers – this does not include the benefits to fuel suppliers. The quantifiable cost of the policy is therefore calculated at £56m, present value to 2040.

6.6 It should be noted that the option selected does not deliver the most renewable heat by 2020. Other potential policy options (such as 20 year tariffs, increased grant or grant plus 20 years) could deliver as much as 983 - 994GWh of renewable however at a significant cost. The costs of other policy options range £148m - £161m, present value to 2040, and in terms of net cost/benefits these policies have a net cost of £127m-140m.

6.7 Therefore to select the policy option we have considered the cost-effectiveness of each option. This is calculated considering the cost of the carbon saved. The selected approach costs £66.31 per tonne of carbon saved compared to a range of £107.79 - £114.72 per tonne of carbon saved. As a frame of reference the cost of off-shore wind is assessed as between £80-90 per tonne of carbon saved.

6.8 Therefore the most cost-effective option has been selected.

Risks

7.1 Given the uncertainties associated with the take-up of renewable heat, it is appropriate to assess the potential risks associated with any policy, and how they might be avoided or mitigated.

7.2 Identified risks have been recorded in the Renewable Heat Risk Register attached at **Annex B**.

Risk of incorrect subsidy level

7.3 Probably the most obvious risk is that the subsidy levels proposed for the scheme are either too high or too low. In the former case, those installing renewable heat will be over-subsidised and less heat will be delivered per pound than under more optimal subsidy levels. In the latter, renewable heat will not be deployed to the extent expected.

7.4 Both high up take and low up take would cause problems. If incentive levels are over generous then the number of applications could be at a level where administrative systems are unable to cope and the scheme's administrators receive a bad reputation from stakeholders. In addition, if tariffs are too high there could be greater displacement of natural gas. It is currently assumed that heating oil will be displaced on most occasions as the tariffs are designed to make renewables as attractive as oil. If the incentive levels are too generous natural gas customers could begin switching to renewables and this would impact on Departmental plans to extend and expand the gas network.

7.5 If tariffs are insufficient to generate required interest then the possibility of achieving the set targets will reduce.

7.6 The normal method of dealing with this risk is firstly to have carefully analysed and researched data in developing the tariffs. The tariffs have been developed by CEPA and AEA Technologies, subject to a public consultation and reviewed by Energy Division.

7.7 However, tariffs could become inappropriate over time if fuel prices change radically. The tariffs are calculated using a number of variables such as the capital, operating and fuel costs of renewable technologies and fossil fuels. Changes in these costs will require the tariffs to be reviewed. It is planned to have regular, planned, reviews of subsidy levels after a number of years of experience with the subsidy. This will provide an opportunity to amend tariffs if required and ensure they remain appropriate given potential changing market conditions. DETI will also retain the right for 'emergency' reviews as required.

Risk of failure in administration of RHI

7.8 The success of the delivery of the domestic RHI scheme is reliant on the administration system. An appropriate system is required for applications to

be received and checked, queries raised where necessary, accreditations made and payments processed. In addition, the administration team need to be able to deal with queries and provide appropriate guidance.

7.9 There is the potential for delays in dealing with applications, accreditations and payments for the NI RHI scheme which would lead to stakeholders complaining about application process. This could be as a result of difficulties in IT systems, a lack of communication between administrator and the Department or the administration system not being able to cope with high numbers of applications. A failure in administration could discredit the scheme and reduce consumer confidence.

7.9 In order to mitigate this risk, Energy Division will develop operating procedures for the administration of the scheme and utilise expertise gained by administering the RHPP scheme. In addition, work will be carried out with IT colleagues to develop a robust system for recording applications and registering accredited technologies. If, in due course, a procurement exercise is carried out to appoint an external service provider the technical specifications will be informed by IT colleagues and experience of delivering the scheme in-house. Appropriate communication procedures would also be developed with DETI and the appointed service provider, this would include a joint project board.

Risk of attempted fraud

7.14 As with any scheme where money is provided to reward or incentivise an action instances of attempted fraud are possible. These could include duplicate or false applications, installation of ineligible equipment, applications not adhering to the conditions of the scheme, unusual meter readings (too high for expected output), lack of information being provided to the administrator and using unregistered installers.

7.15 The administration of the RHPP has proven successful in discovering a number of suspected instances of fraud. These have been reported to the appropriate channels. Examples of which include, non-accredited installers carrying out installations or non-accredited products being installed and incorrect certificates being provided to the Department.

7.16 The Department has put in place measure to counteract instances of fraud including:

- Clear guidance for applicants;
- Assessment of applications and verification of installations and meter readings;
- Liaison with administrator on instances of suspected fraud;
- Site audits / checks;
- Requirements of detailed information for each installation;
- Use of MCS under 45kw installations;
- Meter readings assessed against expected output;
- Requirement for ongoing statements of compliance; and

- Witholding the right to suspend and/or recover payments.

7.17 Where there are instances of suspected fraud, the participant will be informed and payments will be stopped whilst an investigation can be carried out. DETI will also retain the power to recover payments.

Risk of failure of renewable heat supply

7.8 Just as supplies of conventional fuels may be disrupted, there is a risk that supplies of renewable fuel (i.e. biomass and bioliquids) will be disrupted. Bioliquids, since locally sourced by assumption, should be less risky than biomass, much of which will be imported. This suggests that the biomass supply chain, and the security of biomass imports, will be an important factor in the actual or perceived riskiness of renewable heat.

7.9 The presence of Balcas (a major pellet provider) in Enniskillen adds a level of security to the supply chain. This has been supplemented by smaller suppliers entering the market in recent years. In some instances, biomass users might 'self-supply' from their own land. This risk will also be minimised by the increased use of imported biomass fuel and the presence of large industrial users who will import fuel for themselves and supply to others.

Non-monetary costs and benefits

8.1 This section covers the costs and benefits that are not monetised. While they have not been monetised, it is noted that in many cases the size of the benefits is likely to be proportional to the extent of renewable heat deployed.

Employment and capacity building, particularly in green sectors

8.2 DECC has estimated[16] that there are 150,000 jobs in the heating industry in Great Britain. Prorating by population size suggests that there are around 3,750 jobs in this sector in NI. Under the RHPP 51 different installers have been responsible for a least one installation. This is in excess of the 26 MCS installers that were certified in Northern Ireland in March 2011 and demonstrates a significant increase in the skills capacity in the sector.

8.3 Investment in renewable energy is likely to create direct jobs as well as indirect jobs across the entire supply chain of the renewable industry including:

- environmental monitoring;
- development design;
- commissioning and procurement;
- manufacturing;
- installation;
- project management;
- transport and delivery and operations; and
- maintenance.

8.4 A number of studies have found a positive net impact on jobs as a result of substitution to renewable sources of energy. This is mainly due to longer and diversified supply chains, higher labour intensity and higher net-profit margins for renewable energy compared to non-renewable energy generation. Increased spending attributed to net new jobs would lead to additional output thus creating a ripple effect in the economy.

8.5 A 2007 European Commission study[17] found that, overall, a 10% substitution towards renewable energy sources compared to non-renewable sources has a positive impact on jobs.

8.6 A study by NERA/AEA[18] reports that four man days by plumbers are required per solar thermal installation. The time required for installation will also be comparable for domestic heat pumps and biomass boilers. As part of the overall modelling for the NI it is estimated that over 20,000 additional renewable heat installations will be required by 2020. In the year 2020 over

[16] http://www.decc.gov.uk/en/content/cms/news/pn2011_023/pn2011_023.aspx
[17] European Commission (2007), DG Environment: Links between the environment, economy and jobs.
[18] http://webarchive.nationalarchives.gov.uk/20110123082441/http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/policy/renewable_heat/incentive/supply_curve/supply_curve.aspx

4,150 installations a year are required, this would equate to roughly 16,000 man days by skilled plumbers. Assuming 220 working days per year this would equate to over 75 specialist plumbers installing renewable heat technologies in the domestic sector. These new skilled jobs cover only one component of the eight areas listed on the previous page. Further research would be required to accurately estimate the full job creation potential of renewable heat.

Job displacement

8.7 Whilst new skills are required for the installation of renewables this would displace work that would have otherwise been undertaken on installing the counterfactual technology. If one assumes that two[19] man days are required for the installation of an oil boiler (excluding the fuel tank) then this would halve the number of additional jobs that may be created – that is, a net increase of 37 jobs. The current market developments are that traditional heating companies are developing teams and up skilling staff with expertise in renewable heat technologies.

8.8 In summary renewable heat will lead to job creation but this will be partly offset by job displaced from fossil fuel heating jobs.

Open to all (special consideration to fuel poor)

8.9 The evidence suggests that the barriers to take-up of renewable heat by the fuel poor include a lack of capital or ability to borrow, and a lack of awareness. However, intermediaries, such as those that have arisen in GB for the domestic renewable electricity market or in the Republic of Ireland for renewable heat, could help overcome both barriers.

8.10 It will be important to specifically engage with potential Energy Service Company's (ESCo's) to highlight to them the potential opportunities in the NI renewable heat market.

Reduction in oil imports

8.11 Analysis suggests that the majority of the fuel displaced will be oil, which is as expected since nearly 80% of heating in NI is from oil.

8.12 NI's current demand for oil is around 17, 558 GWh/ year[20], which is around 10.3 million barrels[21]. The NI RHI is expected to displace around 1.1 million barrels (11% of oil imports). This reduction in oil imports would reduce NI's exposure to the price of oil and to the risk of disruptions in oil supplies. However, there would be a countervailing increase in the exposure to the

[19] The oil boiler would generally be a direct replacement for an existing oil boiler. Renewable heat equipment would be a new installation and would require additional work to install/modify controls and ancillary works, which leads to the estimate of four man days.
[20] AECOM/ Pöyry, 2010, op. cit.
[21] Assuming 1 barrel of oil =6.119GJ, source: Energy Information Agency www.eia.gov

global price of biomass and the biomass supply chain. On balance, though, the increased diversity of fuel supply should be beneficial for security.

Impact on the gas network

8.13 As detailed in the SEF, it is a stated policy objective for DETI to extend the gas grid in NI. Renewable heat, as an alternative source of heat, has the potential to impact on this, possibly negatively. The size of the impact can be measured through estimating the impact on the revenue of gas supply companies of renewable heat. The issue here is not simply with the RHI but with virtually any support mechanism for renewable heat. In other words, part of the impact is due to the fact of having a renewable heat target at all, and the remainder is due to the way that it is delivered.

8.14 Analysis done on the feasibility of extending the gas network assumes that 80% of potential commercial loads switch to gas, which is consistent with a 10% switch to renewable heat. Sensitivity analysis using the economic model suggests that shifts in gas prices relative to oil should not lead to any RHI causing more displacement. This is because subsidy levels have been set based on the amount needed to cover the cost difference between oil and renewable heat – in effect, making renewable heat as economically attractive as oil.

8.15 There are two scenarios to be considered on the relative price of oil and gas: gas becomes relatively cheap compared to oil (and so renewable heat), and gas becomes relatively expensive compared to oil (and so renewable heat). In the first scenario, consumers currently on oil and looking to switch are unlikely to choose the relatively expensive renewable heat option over the cheaper gas option. In the second, consumers on oil are unlikely to switch to the relatively expensive gas option in any case – whether or not renewable heat is subsidised – the sensitivity analysis shows a significant drop in gas connections in this case. So in neither case is renewable heat providing a significant disincentive to switching to gas.

8.16 It is also important to note that the switch to or from gas is not driven simply by economics. Gas, unlike many renewable heat technologies, is relatively well-understood and established and these benefits may sway consumers' decisions in favour of gas. All that said, a key risk is the extent to which we have set the subsidy levels at just the right level to preferentially displace oil rather than gas (or potential gas) customers.

8.17 In any case, the economics of the gas network (both the existing network and the proposed extension) is driven by large commercial loads. The domestic RHI, that supports domestic customers switching to renewables, will therefore have minimal impact. The RHPP has demonstrated that renewable heat is displacing oil nearly 98% of the time. Where gas is displaced it is normally by solar thermal, which only provides some hot water heating.

8.18 In summary, it is difficult to see that domestic renewable heat should make a material difference to decisions about any roll-out of the gas network.

Displacement effects in other sectors

8.19 Leaving aside the impact on the gas network and on oil imports, the other significant displacement impacts are likely to be focused on the oil sector, and are largely an inevitable consequence of a move away from the current level of oil use for heating; we would expect these to be proportional to the level of reduction in oil imports. The impacts could include:

- A reduction in the need for the oil network, as a result of falling oil demand. This could be offset by the deployment of bioliquids, that will be supported under the domestic RHI.
- Less of a need for expertise in oil boiler installation (although this will be offset by increased need for expertise in renewable heating installation).

Air quality

8.20 There could be air quality impacts from widespread take-up of biomass heating, particularly if this is in urban areas. However, the relative impact will depend significantly on the fuel displaced. The impact assessment for the GB RHI[22] notes that where renewable heat displaces oil, the "[air quality] impacts can be positive", whereas displacement of gas tends to worsen air quality. As it can be assumed that renewables will predominantly displace oil there should be a positive impact on air quality.

[22] DECC, 2011, Renewable Heat Incentive Impact Assessment

Calculate net present values and assess uncertainty

Net Present Values

9.1 All the potential options considered for the domestic RHI scheme, purely on the basis of monetised costs and benefits, have a negative net monetised cost benefit. This of course takes no account of non-monetised costs and benefits. This was also the case when the commercial RHI was approved in April 2012.

9.2 In monetised cost-benefit terms; however, the option selected for the domestic RHI is both the most preferable in terms of NPV and the most cost effective in terms of the cost of carbon saved. The NPV for the domestic RHI is calculated at £-56m. This is in comparison to NPV rates of £-127m to -140m for the other options considered.

9.3 In addition, the option selected is the most cost effective with it estimated that a tonne of carbon will be saved for £66.31. This compares to a tonne of carbon saved for £107.79 - £114.72 for other options. This also compares favourably in terms of the cost of offshore wind which is assessed at £80-90 per tonne of carbon saved.

Uncertainties and constraints

9.4 The focus here is on the uncertainty over domestic consumer take-up rates. These will be driven by three factors: consumers' discount rate, their awareness of renewable heat technologies and their ability to borrow (or rely on ESCOs) to finance upfront capital costs.

9.5 Analysis carried out in 2011 suggested that the impact of the domestic consumer's discount rate being higher than accounted for (i.e. higher than 7.5%) was much less in comparison to a lack of awareness of renewable heat leading to only 50% of potential technologies being installed. This could indicate that rates are sufficient enough to generate required uptake. It is also indicative that where a constraint applies across the board, such as a lack of awareness, it has a greater affect. The impact of a high level of consumer misunderstanding or unawareness was that 130GWh less renewable heat would be delivered.

9.6 There is also uncertainty in terms of the possible impact of consumers being capital constrained – in other words, being unable to afford the upfront cost of a renewable heat installation, even if it would be profitable for them in the longer term.

9.7 When assessing options a capital constraint was imposed on households with the assumption that households would not spend much more on a renewable heat installation than a new oil or gas boiler (assumed £3,500). This is a tight constraint but not unreasonable considering the following;

- The low levels of savings in NI, with figures suggesting over 70% of NI households have less than £3000 in savings.
- The experience of the RHI and RHPP to date has shown that the domestic scheme has been more popular, with over 1500 domestic applications in comparison to over 100 in the commercial scheme. This is also borne out in comparison with GB where the RHI uptake is around 6-7% of GB, whereas the NI RHPP is 10%+ of GB uptake. This demonstrates that the grant based RHPP is more attractive despite the RHI being more rewarding in the long term.
- The importance of heat compared to electricity. The confidence required in the renewable heat technology needs to be higher than renewable electricity technologies for the fact that the heat technology will be, in the majority of cases, a primary technology. If the biomass boiler or heat pump fails the householder will be without heat. Renewable electricity technologies (PV, wind etc) are generally used to supplement existing power supply and if the technology fails the householder does not suffer power cuts. Householders are therefore assumed to be much more cautious in deciding on renewable heat and are unwilling to pay a premium.

9.8 When analysis is carried out with no spending constraint a lifetime (20 year) domestic tariff performs best. The figures for options that include a level of grant do not vary greatly, suggesting that the outcome from these options is not hugely dependent on the level of constraint, whereby the success of the lifetime tariff options are dependent on assumptions on capital constraints.

9.9 Previous analysis carried out on this issue demonstrated that by providing an element subsidy up front the impact of the capital constraint is reduced significantly. Therefore an option whereby the tariff is paid over a shorter period of time (7 years) with an element up front is less sensitive to assumptions on capital constraints.

Assess affordability and record arrangements for funding, management, procurement, marketing, benefits realisation, monitoring & ex-post evaluation

Affordability

10.1 As previously stated, funding of £25m is available to 2015/16 for this scheme, following that DETI will need to secure additional funding from DECC to continue the scheme to 2020. DECC has indicated that the GB scheme will be open to new entrants to 2020 and in the GB State Aid application noted that the expected subsidies paid in 2020 in the GB RHI to be in the order of £2.3bn, a 3% pro-rata share of these subsidies is £70m. It is therefore assumed that DETI will receive additional funding post 2016 as a pro-rata share of DECC budget for the RHI.

10.2 In developing the NI RHI, CEPA assumed a funding profile of £2m/£4m/£7m/£12 and then an additional £5m per annum to 2020, i.e. £17m/£22m/£27m. This developed from impact assessments published by DECC and is less than an incremental 3% share of GB expected spend. The tariffs are designed with an overall budget constraint within these parameters.

10.3 DECC has secured £430m for the GB RHI for 2015/16. DECC Minister Gregory Barker indicated to Minister Foster in a letter dated 7th February 2014 that the Barnett consequentials of this funding should be forthcoming to Northern Ireland however this is yet to be confirmed. It could be estimated that this funding would be in the order of £10.8m – 12.9m.

10.4 The relative populations of NI and GB (1.8m [23]and 60m[24] respectively, in mid 2009) were applied to the figures in Table 5 of the GB RHI Impact Assessment[25], which shows a present value of subsidy to 2020 of £5.4 billion, and a lifetime present value of subsidy of £22 billion. Pro-rating these by the respective population sizes, gives corresponding subsidy figures for NI of £162m and £660m respectively.

10.5 The policies relating to the RHI have therefore been developed using a funding constraint of £42m in 2020 and it is expected that the funding levels will not be exceeded.

10.6 HMT has indicated that any spending commitments made via the initial NI RHI (i.e. through the £25m) will be met by ongoing RHI payments from HMT.

[23] Source: NI Statistics and Research Agency.
[24] National Statistics figure for UK, less figure given above for Northern Ireland.
[25] DECC, 2011, Impact Assessment for Renewable Heat Incentive, http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Renewable%20energy/policy/renewableheat/1381-renewable-heat-incentive-ia.pdf

10.7 DETI is therefore content that the scheme is affordable under the current funding profile and the expected available budget post 2015/16.

Marketing

10.8 Energy Division has carried out advertising campaigns promoting sustainable energy in 2011/12, 2012/13 and 2013/14. The two most recent campaigns have solely focused on the promotion of renewable heat. These campaigns were funded via the European Research and Development Fund, as things stand there is no available budget in 2015/16 for future campaigns. If the budgetary position changes Energy Division will consider whether it is appropriate for further marketing campaigns. The domestic RHI will be promoted via appropriate PR activity.

Monitoring and benefits realisation

10.9 DETI will monitor uptake, trends and policy impact from the beginning of the scheme. The level of renewable heat delivered by the scheme will be assessed and recorded against the 10% renewable heat target.

First review

10.10 The first formal review of the commercial RHI will begin in early 2015 with necessary changes implemented in 2016. The primary focus of this review will be the level of tariffs and the appropriate banding.

10.11 Given that the domestic RHI will only launch in 2014 it would be inappropriate to formally review the scheme so earlier. Therefore a formal review would take place in early 2016, with changes implemented in 2017. DETI holds the right to carry out emergency reviews if required and will informally review the scheme throughout.

Post project evaluations

10.12 A final PPE will be carried out following the closure of the scheme to new entrants; this will be completed by 31st March 2022.

Assess the balance of advantage between the options and present the results & conclusions

Recommended Approach

11.1 The recommended approach is that DETI implements a Domestic Renewable Heat Incentive for Northern Ireland, at tariff levels detailed below.

11.2 It is also recommended that DETI initially administer this scheme in-house until the most appropriate long term solution can be assessed.

Domestic RHI – Tariffs and technologies

11.3 The proposed tariffs are outlined below, for ease of reference the equivalent tariffs in the GB scheme are also included. The NI tariffs are generally lower than the GB tariffs and whilst GB do not offer any up front support the overall subsidy paid in NI remains lower.

Technology	Initial payment made on accreditation[26] (£)	Ongoing (p/kWh)	GB tariff levels (p/kWh)	Comparative NI tariffs with GB (p/kWh)
Solar Thermal	320	13.05	19.2	16.4
Biomass boiler	2500	5.53	12.2	7.9
Bioliquids	500	2.7	n/a	-
Ground Source Heat Pump	3500	8.04	18.8	13
Air to Water Heat Pump	1700	3.44	7.3	8.1

11.4 The first payment will be made once the system is accredited by DETI i.e. all eligibility standards have been confirmed. The ongoing tariff based payments will then be made on an annual basis providing a statement of compliance has been completed by the applicant.

11.5 Domestic RHI payments will be made, for the most-part, on a deemed basis. This means DETI will estimate the heat requirements of the property at which the technology is installed and provide a fixed payment. Where a back up heat system is retained or where the property may not be occupied for the more than 6 months in the year the payments will be made on the metered heat output but capped at the deemed level.

11.6 It is expected that the domestic RHI will be open to new installations until 2020, meaning the final payment from the scheme will be in 2027.

[26] These upfront payments are set in line with the support offered under the RHPP; this makes the scheme administratively simple in that RHPP applicants receive the ongoing tariff only. For bioliquids, where no RHPP has been provided, up front support of £500 has been proposed.

Administration

11.7 As previously discussed, it is proposed that the scheme will be initially administered in-house, using existing resource. Therefore no additional resource is required. An assessment will be taken within the first 3 months of the scheme as to whether it can continue to be administered in-house or whether external support is required (either full administration, support for payments or technical advice). If external support is required a separate business case will be prepared and an external procurement competition held.

11.8 If the scheme continues to be administered in-house a significant risk will be the need for additional resource if levels of uptake increase significantly. Progress of the scheme will be regularly reviewed. If interest in the scheme reaches a level where the scheme cannot be managed in-house then remedial action will be required.

Legislation and State Aid

11.9 The primary power to enable DETI to make regulations for a scheme to encourage renewable heat was incorporated into the Energy Act 2011[27] which was given Royal Assent on 18 October 2011. The necessary secondary legislation has been drafted but cannot be finalised until the design of the scheme is finally specified; we will then proceed to lay the Domestic Renewable Heat Regulations through draft affirmative resolution procedure in the Assembly.

11.10 The scheme does not require full State Aid approval as it is primarily focussed on the incentivisation of domestic householders. However State Aid consideration may be required on the issue of provision of support to landlords (private and social) and ESCo's.

Approvals

11.11 This business case has been considered by G7 economist within DETI Energy Division. He is content that this appraisal has been carried out in accordance with the NIGEAE guidance and that the approach adopted represents value for money and is the most effective way of allocating resources provided by HMT for the purpose of incentivising domestic renewable heat installations.

11.12 Whilst there is a significant cost associated with this policy, it will reduce carbon emissions and facilitate the development of a renewable heat sector within Northern Ireland. This, in turn, will help Northern Ireland to achieve its 10% renewable heat target by 2020.

[27] http://www.legislation.gov.uk/ukpga/2011/16/part/3/crossheading/northern-ireland-renewable-heat-incentives

Recommendation

11.13 It is recommended that you approve the implementation of the Northern Ireland Domestic RHI

Annex A - Development of Phase II of the Northern Ireland Renewable Heat Incentive by Cambridge Economic Policy Associates and Ricardo-AEA (June 2013)

Attached separately

Annex B – Domestic RHI Risk Register

Attached separately