Title: Impact Assessment for the consultation on The Renewable Heat Incentive: Providing certainty, improving performance: Longer term budget management	**Impact Assessment (IA)**
	Date: 25th June 2012
IA No: DECC0093	**Stage:** Consultation
	Source of intervention: Domestic
	Type of measure: Secondary legislation
Lead department or agency: Department of Energy and Climate Change **Other departments or agencies**: n/a	**Contact for enquiries:** Stephen Smith – 0300 068 5021 Geraldine Treacher - 0300 068 6858

Summary: Intervention and Options

RPC: n/a

Cost of Preferred (or more likely) Option				
Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANCB in 2009 prices)	**In scope of One-In, One-Out?**	**Measure qualifies as**
Positive	£m	£m	No	N/A

What is the problem under consideration? Why is government intervention necessary?

The Renewable Heat Incentive (RHI) is a payment to owners of renewable heat installations based on the amount of renewable heat produced. Although it is a demand-led subsidy, there is currently no formal long term cost control mechanism in place to manage RHI expenditure should deployment of renewable heat be higher than expected. This affordability risk and the value for money implications of potentially "over paying" owners of renewable heat technology are the key rationales for intervention. Putting in place an appropriate cost control mechanism would help ensure tariff levels are adjusted in the event of higher than expected deployment thereby aiding a smooth, steady growth in renewable heat rather than start-stop deployment. An additional rationale for intervention is to reduce uncertainty in the market to strengthen confidence in the policy and support investment.

What are the policy objectives and the intended effects?

- To ensure value for money to the tax-payer;
- To put in place a system that enables the RHI budget to be managed effectively; and
- To reduce policy and investment uncertainty in order to grow investment in renewable heat installations;

While there are trade-offs between achieving greater investor certainty and more strict budgetary control, all three objectives are designed to ensure value for money to the tax-payer, improve transparency in future tariff rate setting and be supportive of greater investment in renewable heat technology.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

- Policy Option 1 – do nothing: this option would not have any long term cost control mechanism in place but instead result in overspend and / or closures of the scheme in the event of the RHI budget being breached;
- Policy Option 2 – degression: this option involves gradually reducing tariff levels for new installations if deployment levels exceed forecasts;
- Policy Option 3 – enhanced preliminary accreditation: this option involves guaranteeing a future tariff level for up to 2 years in order to reduce uncertainty in the market;
- Policy Option 4 – quota system: this option would ration the RHI budget on a "first come first serve" basis;

Policy option 2 is the preferred option as it would mean an improvement in the value for money of the RHI scheme. We recognise the potential benefits of policy option 3 which could be combined with option 2 or 4 but at this stage would like to use the consultation process to gather further evidence on the costs and benefits of this option.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 2014

Does implementation go beyond minimum EU requirements?			**N/A**		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro Yes**	**< 20 Yes**	**Small Yes**	**Medium Yes**	**Large Yes**
What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)			**Traded: n/a**	**Non-traded: n/a**	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister: Gregory Barker Date: 29 June 2012

Summary: Analysis & Evidence — Policy Option 2

Description: degression of tariffs - committed RHI expenditure for the next 12 months will be reviewed on a quarterly basis. If this committed expenditure exceeds our baseline forecast, tariffs for new installations will be degressed on a continuous basis (every quarter) until committed expenditure falls within our baseline forecasts.

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: n/a	**High: n/a**	**Best Estimate: Positive**

COSTS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Cost** (Present Value)
Low	Negligible		Negligible	**Negligible**
High	Low		Low	**Low**
Best Estimate	Low		Low	**Low**

Description and scale of key monetised costs by 'main affected groups'

- Not quantified (see Evidence section);

Other key non-monetised costs by 'main affected groups'

- Threat of degression could have a negative impact on investor confidence resulting in less renewable heat deployment thus undermining efforts to meet 2020 renewables target;
- Potential anticipation of degression could cause a spike in demand which would limit the ability of this mechanism to control budgets and mean demand may not respond to degression in the way predicted;
- Potential for unnecessary degression if there is a spike in deployment in one particular quarter;
- "Menu" cost to investors from potentially frequent tariff degressions;

BENEFITS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	Negligible		Negligible	**Negligible**
High	Low		High	**High**
Best Estimate	Low		Positive	**Positive**

Description and scale of key monetised benefits by 'main affected groups'

- Not quantified (see Evidence section).

Other key non-monetised benefits by 'main affected groups'

- Demand-based system that enables subsidy to be amended as the technology matures ensuring value for money to the tax-payer;
- Ensures a smooth deployment of renewable heat installations consistent with the 2020 renewables target and avoids disruption to scheme and demand;
- System relatively transparent and conducive to growing investment in renewable heat in technology;
- Assists in managing the RHI budget;

Key assumptions/sensitivities/risks — **Discount rate (%)**: n/a

- Demand is relatively responsive to degressions in tariffs (relatively frequent degressions helps minimise risk if demand is not);
- Degression triggers become self-fulfilling undermining efforts to meet 2020 renewables target or triggers cause spikes in demand limiting ability to manage budget;

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			**In scope of OIOO?**	**Measure qualifies as**
Costs:	**Benefits:**	**Net:**	No	N/A

Summary: Analysis & Evidence — Policy Option 3

Description: Enhanced Preliminary Accreditation (EPA) – potential claimants of the RHI will have a tariff rate guaranteed for up to 2 years. This tariff rate will be pre-determined and will apply once the installation has been developed and is producing renewable heat. All 'successful' EPA applicants would be accounted for in RHI spending forecasts (starting from the date the applicant has advised the installation will be commissioned). These RHI forecasts will be compared against the baseline forecast to determine whether degression is necessary.

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low:	High:	Best Estimate:

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Not quantified		Not quantified	**Not quantified**
High	Not quantified		Not quantified	**Not quantified**
Best Estimate	Not quantified		Not quantified	**Not quantified**

Description and scale of key monetised costs by 'main affected groups'

- Not quantified (see Evidence section).

Other key non-monetised costs by 'main affected groups'

- Potentially higher cost to public sector if investor(s) receive a "booked" tariff which is greater than the prevailing tariff rate (although questionable whether such investment would have happened in the absence of the policy);
- Potential risk of gaming and strategic behaviour from firms;

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Not quantified		Not quantified	**Not quantified**
High	Not quantified		Not quantified	**Not quantified**
Best Estimate	Not quantified		Not quantified	**Not quantified**

Description and scale of key monetised benefits by 'main affected groups'

- Not quantified (see Evidence section).

Other key non-monetised benefits by 'main affected groups'

- Reduced investor uncertainty, which may support greater investment in renewable heat installations for a given tariff relative to a 'do nothing' option therefore resulting in better value for money;
- Improved understanding by Government of renewable heat market and projects in the pipeline thereby aiding policy formulation and aiding public sector budgeting;

Key assumptions/sensitivities/risks — **Discount rate (%)**: n/a

- It is relatively straightforward to allocate the (capped) budget available for enhanced preliminary accreditation;
- Potential risk of gaming and strategic behaviour by firms;

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs:	Benefits:	Net:	No	N/A

Summary: Analysis & Evidence — Policy Option 4

Description: introduce a quota system – RHI expenditure in any given year will be allowed to rise until the budget for that particular year is reached. The scheme would then close for new applicants until the following year (assuming the 'legacy' expenditure commitments from the previous year does not result in insufficient budget to support new installations). There are three options when the scheme re-opens: (1) re-open the scheme at the same tariff rates (2) have a review to re-estimative 'new' (lower) tariffs for when the scheme re-opens or (3) set out degression rules in advance for re-opening.

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Negative	High: Negative	Best Estimate: Negative

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Very Low		Very Low	**Very Low**
High	Low		High	**High**
Best Estimate	Low		Low	**Low**

Description and scale of key monetised costs by 'main affected groups'

- Not quantified (see Evidence section).

Other key non-monetised costs by 'main affected groups'

- Potential suspension of the scheme would create stop-start market;
- Uncertainty and stop-start market could undermine investment in renewable heat technology and the meeting of the 2020 renewables target;
- Not adjusting tariff rates in response to changes in the maturity of technology could lead to over payments and reduced value for money';
- Low value for money as quota system could result in fewer cost-effective technologies coming forward;

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Very Low		Very Low	Very Low
High	Low		Low	Low
Best Estimate	Low		Low	Low

Description and scale of key monetised benefits by 'main affected groups'

- Not quantified (see Evidence section).

Other key non-monetised benefits by 'main affected groups'

- Policy option provides largest certainty on budgetary control;
- System relatively straightforward to implement as the relevant trigger level is simply related to the baseline level of deployment.
- Helps support management of RHI budget;
- Degression of tariffs in response to (unexpected) changes in demand enables and improvement in value for money;

Key assumptions/sensitivities/risks — **Discount rate (%)**: n/a

- There is no large spike in demand as spending approaches a potential 'trigger' level indicating the scheme needs to be suspended for that year;
- There is sufficient budget available following a scheme suspension after 'legacy' expenditure to finance new deployment;

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs:	**Benefits:**	**Net:**	No	N/A

Evidence Base

Background

The Government has a target of 15% of energy coming from renewable sources by 2020. One means of achieving this is through an increase in the level of renewable heat use in the UK. It is estimated that renewable heat will contribute approximately a third towards this overall energy target. However, this will mean an increase in the proportion of heat derived from renewable sources from 2% currently to 12% in 2020.

A key means of increasing the use of renewable heat use in the UK (and encouraging a shift away from fossil fuel heating) is through the Renewable Heat Incentive (RHI). The RHI was introduced in November 2011 and is a long term tariff scheme providing an inflation-linked subsidy over 20 years to owners of renewable heat installations based on the amount of renewable heat produced.

Tariffs were based on the best available data at the time the RHI was introduced in order to ensure there was an adequate financial incentive to make investing in renewable heat technologies commercially attractive. Although we are not expecting significant reductions in costs at this stage, it is possible that as more data becomes available, and / or there are cost reductions experienced in certain technologies, tariffs may end up being too high for future installations. Offering investors an excessive rate of return would mean the scheme would not deliver at least cost and pose budgetary risks.

The budget for the RHI for the next two years is given in the table below. The RHI is funded directly from Government spending and has been assigned annual (nominal) budgets for this Spending Review (SR) period. The annual budgets are not flexible and therefore any under spend in one year cannot be carried forward to future years.

Figure 1: Allocated RHI budget (nominal prices)

Financial year	Spending Envelope £m
2013/14	251
2014/15	424
Total	**864**

It is important that if forecast levels of deployment turn out to be higher than expected, an appropriate cost control mechanism is in place to manage the public sector cost implications. In the event that (unexpectedly) high deployment is a result of tariff rates being too high, there would also need to be an appropriate cost control mechanism in place to ensure value for money to the tax-payer.

It may be that uncertainty in the level and sustainability of the RHI could be undermining investor confidence in renewable heat and therefore the Government's ability to meet its renewables target. Therefore, as well as the twin objectives of ensuring value for money and budgetary control, any cost control mechanism must also be balanced against the need to ensure certainty and transparency in the payment of the RHI. Certainty is particularly important for large scale renewable heat installations (e.g. a combined heat and power plant) which can take around 2-3 years from the initial investment to when it would be eligible to receive the RHI. Large scale investment may require investors to have certainty on the level of tariff they would receive in order to calculate their expected rates of return and to secure funding. This Impact Assessment assesses the costs and benefits of the policy options aimed at managing the RHI budget and reducing policy uncertainty in the consultation 'The Renewable Heat Incentive: Providing certainty, improving performance: Longer term budget management'.

Problem under consideration

The RHI is a payment to owners of renewable heat installations. The total level of future payments is uncertain and will depend on investment in eligible installations. Forecasting the demand for renewable heat installations is problematic as it will depend on a number of factors such as the cost of the renewable heat technology, its performance, the cost of alternative fossil fuel heating, the attitudes of consumers and the supply chain's ability to expand.

If RHI expenditure increases in line with expectations then we would not expect the allocated RHI budget to be breached (at least within this spending review period). However, the uncertainty associated with forecasting – particularly over a number of years - means there is a risk that expenditure could be above our baseline forecasts. If this occurs (and in the absence of an appropriate cost control mechanism being in place), the RHI scheme would have to be temporarily suspended for new applicants once a particular level of spending is reached. The stop-start subsidy system would create additional uncertainty and have a negative impact on the market, undermining confidence in the policy and investment in renewable heat technology and the achievement of the renewables target. It would also mean potential innovation and carbon benefits are being foregone.[1] It is therefore important that an appropriate cost control mechanism ensures value for money, budgetary control and provides a reasonable level of certainty and transparency for potential investors in renewable heat installations.

As there are a range of factors that could lead to degression (or quotas) being required – significant reductions in renewable heat costs, large increases in fossil fuel prices, changing customer attitudes etc – and a large number of possibilities and combinations of various responses resulting in a wide range of possible changes in deployment (e.g. a 5% degression resulting in a 0%/5%/10% change in deployment), monetising the impact of these policy options is problematic and would be based purely on illustrative forecasts and hypothetical demand responses. Therefore, this Impact Assessment (IA) will set out the framework for the different policy options and different scenarios of degression. It will also focus on key non-monetised impacts and the trade-offs with different options and how they are expected to meet the identified policy objectives.

Rationale for intervention

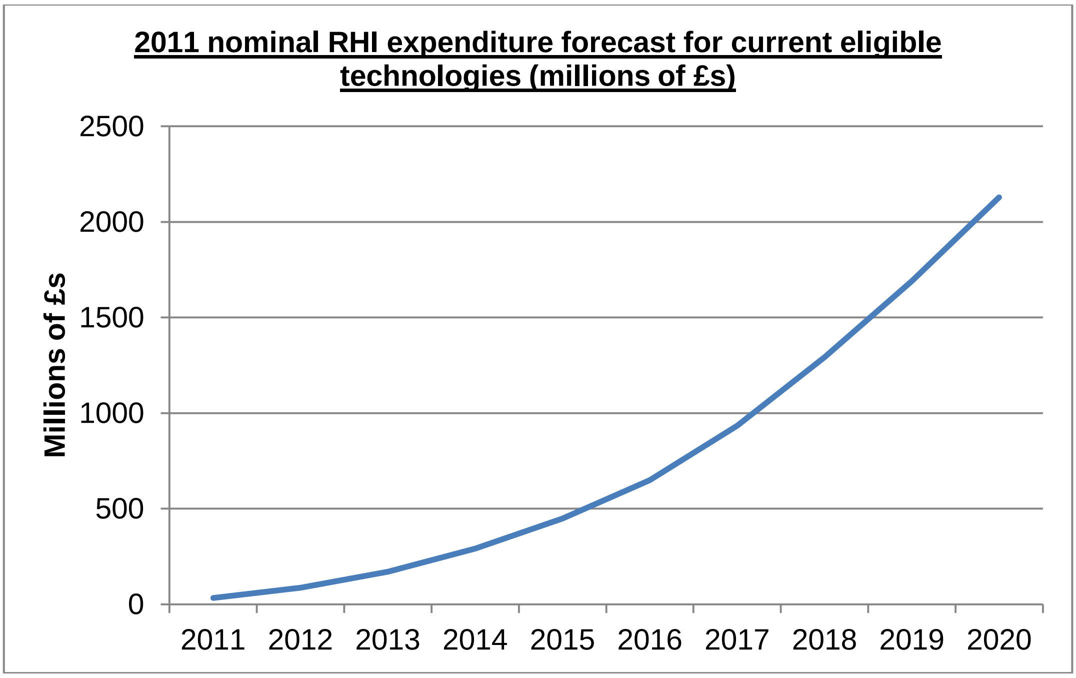
Supporting renewable heat is important for:

1. Meeting the renewables target of 15% of energy coming from renewable sources by 2020;
2. Carbon reduction and legally binding carbon targets; and
3. Energy security and reducing dependence on fossil fuel heating;

While all the above objectives are desirable, there is not an unlimited level of resource available to support a high level of renewable heat deployment. The chart below sets out a smooth trajectory for spending against the RHI budget up to 2020. It is based on the level of deployment underlying the 2011 IA on the RHI.[2] The forecast is consistent with the level of budget allocated to the RHI up to the next SR and reflects the overall costs and benefits of the RHI. In particular, it is consistent with a cost-effective renewable heat contribution towards meeting the 20% renewables target.[3]

[1] The 2011 Impact Assessment estimated a CO_2 equivalent reduction in greenhouse gas emissions of 31m tonnes in the traded sector and 211m tonnes in the non-traded sector.
[2]The 2011 Impact Assessment forecast the level of renewable heat increases from around 1.1 TWh in 2011 to 56.5 THw by 2020 (see http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/renewable-energy/3775-renewable-heat-incentive-impact-assessment-dec-20.pdf).
[3] http://www.decc.gov.uk/assets/decc/what%20we%20do/uk%20energy%20supply/energy%20mix/renewable%20energy/ored/25-nat-ren-energy-action-plan.pdf

Figure 2 Forecast nominal spending on the RHI[4]



For a degression mechanism that links tariffs reductions to deployment, a key rationale for intervention is to ensure value for money. Degression would only be introduced in the event that projected RHI expenditure exceeds the allocated budget (see section below which describes the degression system). Such a scenario would be an indication that tariff rates were too high and therefore the incentive was stronger than necessary to deliver the policy's objectives. This would not represent value for money. Therefore, it would be important for the degression mechanism to support a smooth, steady trajectory of deployment in line with the 2020 renewables target.

A second rationale for intervention is to ensure the increase in deployment does not exceed the budget available, which in turn could force a suspension of the programme and the ability of the RHI to support renewable heat contributions to the 2020 renewables target. Without appropriate intervention, the Department of Energy and Climate Change (DECC) would have to resort to use blunt forms of intervention to limit the level of spending in any one given year should RHI expenditure exceed the budget available. Such intervention could undermine confidence of investors in the supply chain and in the technologies for end use by creating a stop-start market.

With Enhanced Preliminary Accreditation (EPA), an applicant would receive a pre-determined tariff rate rather than the prevailing tariff rate at the time the installation begins producing renewable heat. If there is a degression mechanism, an EPA applicant may (if tariffs have been degressed) be in receipt of a higher tariff rate than a non-EPA applicant. All committed RHI expenditure (including expected expenditure from installations with EPA) would be taken into account when assessing if degression is required.

The EPA seeks to overcome the potential policy failure and uncertainty barrier in the expected value of a future subsidy income stream by allowing the forward 'booking' of projects. In contrast to a degression or quota system, the primary aim of EPA would be to reduce uncertainty for investors rather than cost control. This means it could be combined with either a degression or quota system of cost control. EPA would also provide a useful information on future investment and pipeline projects which can help in forecasting future expenditure and potential cost pressures earlier than what otherwise would be the case.

There is also a value for money rationale to this intervention. The schemes that are most likely to want to 'lock-in' an agreed tariff are those that have long lead in times and high fixed costs. These tend to be larger and more cost-effective installations which deliver a larger amount of benefit (renewable heat produced) per £1 of Government expenditure than smaller installations. For example, large commercial heat pumps have a subsidy cost of 3.4p per kilowatt hour and large commercial biomass 1p per kilowatt hour. This compares against 4.7p per kilowatt hour for small commercial heat pumps and 8.3p per kilowatt hour for small commercial biomass (tariff rates quoted are in nominal prices and as of April

[4] Forecasts based on assumption and deployment forecasts in the 2011 IA.

2012). Therefore, if there are fewer cost-effective installations coming forward, the total public sector cost per kilowatt hour of renewable heat produced will be higher.

Policy objectives

The key policy objectives of the cost control measure are to put in place a transparent system that is capable of managing the RHI budget, should demand (and therefore spending) exceed forecasts that:

1. ensures value for money;
2. avoids suspensions of the scheme;
3. reduces uncertainty in the market; and
4. is relatively straightforward to administer and implement;

These objectives provide the criteria to assess each policy option against. A cost control measure that meets these objectives should help support the sustainable roll out of renewable heat technology and help Government meet its renewable energy target.

Options considered

Policy Option 1: Do nothing

This option is a continuation of the current RHI policy without any long term cost control mechanism in place. In this scenario, if demand is higher than expected in any particular year, there would have to be either an overspend or a closure of the scheme in the following year. It is also likely that there would be a lag in the time that DECC would be able to respond which would mean any potential overspend would be difficult to control precisely. As a result, resource would need to be found from the subsequent years budget which could mean a suspension of the scheme if there were insufficient funds. This type of demand response would be an indication that the tariff rates were too high implying potential excessive economic rents and deployment in the short term at the expense of more sustainable deployment over the medium-to-long term given budgets. The uncertainty and stop-start impact on the market this could have would not be supportive of generating sustainable growth in renewable heat deployment. From a public sector financing perspective, it would also mean lower value for money and a reduced ability to manage the RHI budget year to year.

Policy Option 2: degression of tariffs

Degression involves gradually reducing the tariff(s) paid to new applicants **if** expenditure exceeds forecasts. This will be evaluated on a quarterly basis. If forecast RHI expenditure for the next 12 months is above a key trigger level of expenditure, tariffs would be reduced by a particular percentage and repeated the following quarter if the reduction was not sufficient to bring expenditure back into line.

This mechanism enables Government subsidy to be reduced as the technology matures. One complication is deciding an appropriate long term baseline to assess forecast expenditure against. The most appropriate forecast is the level of expenditure implied from the 2011 IA (Figure 2 above). This forecast is consistent with a significant renewable heat contribution towards meeting the 2020 renewables target. It was also the basis for estimating the RHI budget for the current SR period. A more detailed explanation of the most appropriate baseline to use in degression is given in Annex A.

Figure 3 shows a smooth level of Government expenditure of renewable heat similar to Figure 2 but includes the adjustment documented in Annex A to reflect the fact that installations will begin claiming the RHI at different points during the financial year. The chart also illustrates a level of spending that is 10% above this baseline forecast. These curves represent two key ‘trigger’ points for any degression. The other key curves are the individual technology curves which are set out in more detail in the benefits section of the degression option.

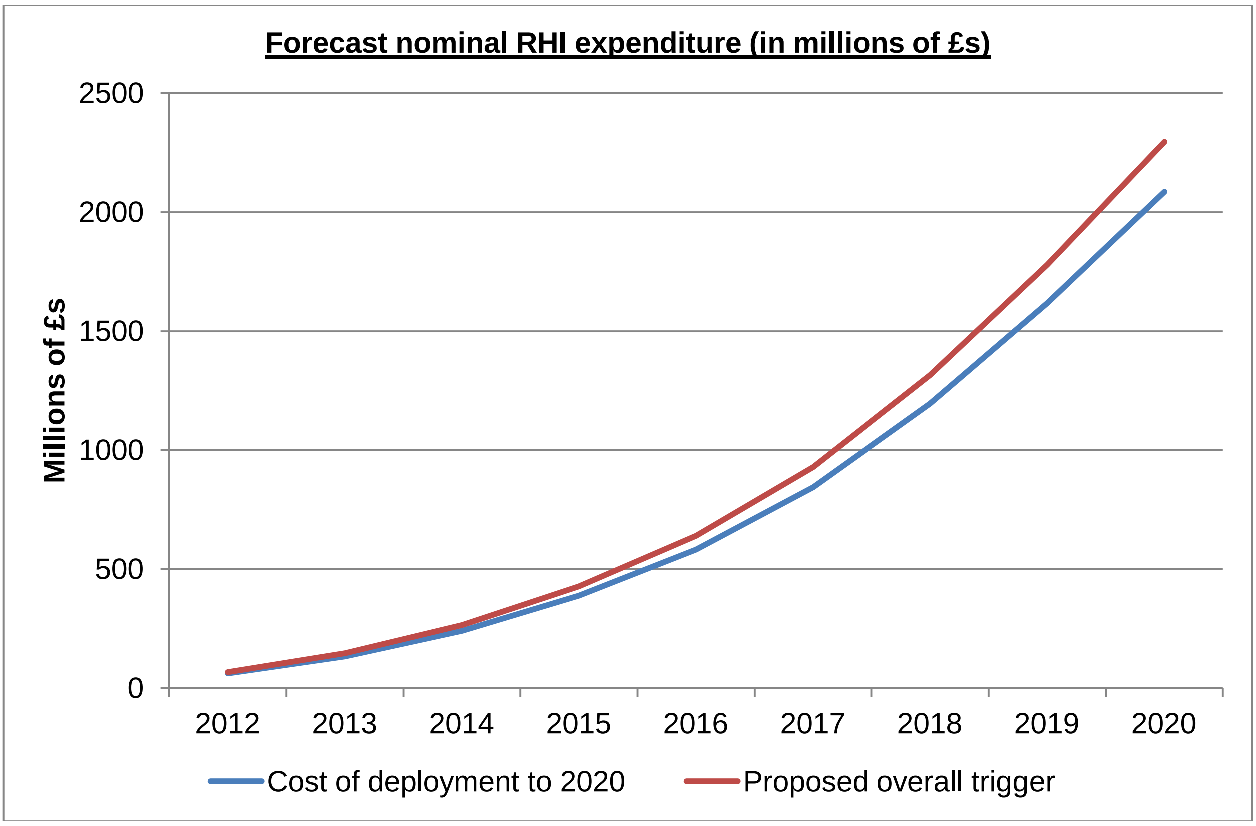
We propose that there are two sets of triggers: triggers for each tariff and an overall trigger for the total non-domestic RHI expenditure. Triggers would measure cumulative expenditure. The overall trigger would be based on the assumed cost of the overall deployment curve required to meet the 2020 renewables targets. The triggers for each tariff would be based upon the assumed cost of the deployment needed to meet the 2020 renewables targets for each technology. Triggers for each technology and for the RHI overall will be based on the level of expenditure required to keep us on a trajectory to deliver the 2020 renewables target.

We are proposing that individual tariff triggers for more cost effective technologies, which incentivise more heat per £1 spent, are scaled above their 2020 renewables cost baselines by a proportion such as 20%. These technologies include medium and large biomass, and ground and water source heat pumps. For the less cost-effective technologies, we suggest a lower trigger such as 5%.

If the overall trigger is hit, then all tariffs deploying above their estimated contribution to the 2020 renewables targets would be reduced by 5%. If an individual tariff trigger is hit (and not necessarily the total trigger hit), then that tariff would be degressed by 5%. If an individual tariff trigger is hit and the total RHI expenditure trigger is also hit, that tariff would be degressed by 10%. We are considering whether a larger degression (such as 20% applied to each technology) may also needed to control growth if deployment does not respond to several degressions.

In order to meet the 2020 renewables target future budgets will need to be commensurate with the profile set out in Figure 1. The RHI scheme budget is agreed to 31 March 2015. Future budgets will be set as part of wider resource allocation processes. However, the underlying principles around degression would remain the same.

Figure 3: Chart illustrating forecast nominal RHI expenditure



Policy Option 3: enhanced preliminary accreditation

Currently, investors in renewable heat are able to claim the RHI once they have become accredited (the term used by the Office of the Gas and Electricity Markets (Ofgem) to denote admission of an applicant to the RHI once Ofgem determine that the installation meets the eligibility criteria of the scheme and that the application for accreditation is properly made[5]) . Once accredited they would receive a tariff at the prevailing rate. In a world of degression there is uncertainty for investors of installations with long lead in times on what the tariff rate will be once the owner of the renewable heat technology is able to claim the RHI. With this option, developers could 'lock in' the tariff rate they will receive once accredited up to two years prior to that point by "booking" the tariff rate subject to certain limits and rules.[6]

Uncertainty over the level of the RHI payment could lead to a lower level of cost-effective renewable heat installations coming on the market. Therefore, there is a risk of potential benefits being foregone without this option. The rationale for this option is to reduce uncertainty in the market. This uncertainty could be undermining investment in renewable heat technology and causing fewer installations to come forward at a given incentive level, particularly larger, more cost effective installations. An EPA scheme addresses this potential policy failure by providing certainty to investors on an expected subsidy income stream.

While the aim of EPA is not to manage the public sector cost implications of higher than expected expenditure (unlike the other options considered in this IA), this option would enable a more accurate picture to be made on potential renewable heat investments. This can help improve RHI expenditure forecasts and identify potential cost pressures earlier than what otherwise would be the case. It is therefore a 'complementary' option that could be combined with either Policy Options 2 or 4 rather than as a 'standalone' cost control option. To avoid the possibility of EPA exhausting all available budget and limiting the ability to support new (potentially smaller-scale) deployment, a cap may need to be applied to the RHI budget on the level of EPAs. This would help ensure there is sufficient headroom in the RHI budget to support deployment of projects that have not applied for preliminary accreditation, perhaps because they have a relatively small lead-in time. When estimating if degression is required, all 'successful' EPA applicants would be accounted for in the RHI spending forecasts (starting from the date the applicant has advised the installation will be commissioned). These RHI forecasts would be compared against the baseline forecast (Figure 3) to determine whether degression is necessary.

Given there is an added commercial benefit from a "guaranteed" tariff rate (given it is lower risk), there is an economic rationale for this "guaranteed" tariff to be lower than the prevailing rate. In particular, investors should be willing to pay a risk premium to reflect the fact that the "booked" tariff could be higher than the prevailing tariff rate once they are entitled to claim the RHI. This means there is a trade-off between potentially capturing some of the producer surplus associated with the RHI subsidy (and the corresponding public sector resource saving) versus incentivising a higher level of renewable heat deployment.

Policy Option 4: Quota / rationing system

This option involves effectively rationing the RHI budget each year on a "first come first serve" basis. This means the level of RHI spending would continue to rise in each year until a particular "trigger level" of spending is reached. This would be similar to the interim cost control measure for the RHI. Once this "trigger" point is reached, the scheme would have to be suspended for new applicants until the following year (assuming there is sufficient budget available to meet both the 'legacy' expenditure of existing installations and new RHI spending on new installations).

If a suspension of the scheme is required, there are then three options for when the scheme re-opens:

1. Reopen the scheme at the same tariff rates;
2. Following a review, reopen the scheme at different tariff rates; or
3. Set out degression rules in advance for reopening.

[5] http://www.ofgem.gov.uk/e-serve/RHI/howtoapply/Documents1/RHI_Guidance_Document_Vol_One.pdf

[6] Further details are set out in the consultation document. However, examples of the key limits and rules include each enhanced preliminary accreditation being valid for a fixed period of time, having a minimum size limit for installations being eligible for preliminary accreditation (as there is a greater need for large installations to have tariff certainty due to their longer lead-in times from planning to construction and commissioning), being able to demonstrate the installation will be eligible for the RHI (i.e. it will be of an eligible renewable heat technology type and size, the heat will be used for an eligible purpose, that metering arrangements are appropriate, and that a grant for purchase or installation costs has not been received or has been repaid). Other requirements include requiring planning permission (or requiring it to be in process) if the heat installation is part of a wider project, confirmation that finance is in place or a plan to obtain it, having a project plan with an expected completion date and confirmation of the capacity that will be installed.

The pros and cons of each of these options are set out below. For option 3, a similar approach to the overall degression system (see previous section) could be applied i.e. a comparison made between all committed expenditure relative to the baseline forecast.

Monetised and non-monetised costs and benefits of each option

The monetised benefit of any cost control option depends on (1) the probability that deployment will be above the baseline forecasts (2) by how much and (3) by how much demand changes in response to any cost control intervention. All three of these issues are unknown at this stage. However, as set out in the recent interim cost control IA, we consider there to be a low probability that there would be any cost control during this SR period. The interim cost control IA[7] suggested 'the rate of applications would need to average (for the period 2012/13) around four times the rate to date'. However, this is for a single year and therefore the percentage increase in deployment would be less for the enduring regime.

We therefore consider three scenarios: (1) a Low deployment scenario where deployment is below our baseline forecast with minimal risk of any cost control mechanism being needed (2) a Central deployment scenario where deployment is in line with our baseline forecast and where there is a reasonable probability of a cost control mechanism being required and (3) a High deployment scenario where deployment is above our baseline forecast and there is a certain chance of a cost control mechanism being needed.

A summary table assessing each policy option according to the policy objectives is given below. While these options are presented as 'standalone' policies, they can be combined. In particular, while there are information benefits from EPA which can aid forecasting future RHI expenditure, its focus is on reducing policy uncertainty and can sit alongside either a degression or quota system. The key issue is whether to exercise cost control through a preset link between deployment and tariff adjustment, or through a quota system that leads to temporary suspensions of the scheme. The quota system has the advantage of ensuring greater budgetary control at the expense of potential investment disruption, while degression involves less investment disruption but gives less certainty on budgetary control. The preferred approach is through a preset link (degression) rather than a system that could lead to investment disruption. The flexibility within the degression system of reducing tariffs by 5%, 10% or 20% depending on committed expenditure, means this option is considered to contain sufficient levers to ensure budgetary control.

Figure 4: Summary of each option

	Improves value for money	Avoids suspensions of the scheme	Reduces uncertainty	Straightforward to implement and administer
Policy option 2: degression	Yes	Yes	Yes	No
Policy Option 3: enhanced preliminary accreditation	Yes	No	Yes	No
Policy Option 4: Quota scheme	No	No	No	Yes

[7] http://www.decc.gov.uk/assets/decc/11/consultation/rhi-cost-control/5052-impact-assessment-rhi-cost-cons.pdf

Policy Option 1: Do nothing

There are no costs and benefits with the do nothing option. However, as discussed above, it is assumed that in the absence of a cost control regulation, the DECC would still need to react to any potential overspend in a potentially crude manner. The lag between intervention and overspend would also allow the problem to persist and worsen in the short-term, increasing the scope of the response necessary.

Policy Option 2: Degression of tariffs

Benefits

- Ensuring value for money

The benefit of degression is that it enables tariffs to be adjusted and amended as technology and customer attitudes change. It therefore reduces the risk of excessive unsustainable deployment and avoids the payment of inefficient rents. The table below illustrates the current tariff levels for different technologies.

Figure 5: RHI tariffs and implied kwh of energy per £1 of RHI expenditure (from 1 April 2012[8])

Tariff name	Eligible technology	Eligible sizes	Tier	RPI adjusted tariff (pence / kwh) from 1 April 2012	Implied kwh of energy per £1 of RHI expenditure
Small commercial biomass	Solid biomass including solid biomass contained in municipal solid waste (incl. CHP)	Less than 200 kWth	Tier 1	8.3	12.0
			Tier 2	2.1	47.6
Medium commercial biomass		200 kWth and above; less than 1,000 kWth	Tier 1	5.1	19.6
			Tier 2	2.1	47.6
Large commercial biomass		1,000 kWth and above	N/A	1	100
Small commercial heat pumps	Ground-source heat pumps; water source heat pumps; deep geothermal	Less than 100 kWth	N/A	4.7	21.3
Large commercial heat pumps		100 kWth and above	N/A	3.4	29.4
All solar collectors	Solar collectors	Less than 200 kWth	N/A	8.9	11.2
Biomethane and biogas combustion	Biomethane injection and biogas combustion, except from landfill gas	Biomethane all scales, biogas combustion, except from landfill gas	N/A	7.1	14.1

These tariffs illustrate that for each £1 of RHI expenditure, 100 kwh of renewable heat can be financed by supporting large commercial biomass technologies compared to only 11.2 kwh from supporting solar collectors. The range of tariffs reflects a trade-off between supporting those RH technologies that are most cost effective today and the need to accelerate development and deployment of RH technologies

[8] http://www.decc.gov.uk/en/content/cms/meeting_energy/Renewable_ener/incentive/incentive.aspx

that could become more cost effective in the future. If Government wishes to be on track to meet the renewables target within the allocated budget (currently only agreed up to 2014/15), an increase in RHI expenditure on the most costly technologies above their baseline forecasts would reduce the ability of the Government to meet its renewables target as it would mean less renewable heat generated per £1 of RHI spending.

Therefore, subject to state aid clearance, meeting the 2020 renewables target would be further supported by having a more flexible banding for the most cost-effective technologies (e.g. medium and large commercial biomass and ground source heat pumps). .

The charts below provide a breakdown of the forecasts in Figure 3 by technology, split by the most and least cost-effective technologies given current costs. A similar approach to an overall system of degression could be applied on an individual tariff basis. However, a more 'lenient' trigger for degression could be applied for the more cost-effective technologies. For example, if forecast spending on any one cost-effective technology was below a particular trigger level – e.g. 20% above its baseline forecast– then there would be no degression if total forecast RHI expenditure was within the baseline forecast in Figure 3. A lower trigger level – e.g. 5% above its baseline forecast in Figure 7 – could be applied to the less cost-effective tariffs and technologies. This would provide greater assurance that we would be on track to meet the renewables target but could reduce the incentive to innovate in the least cost-effective technologies.

Figure 6: Chart illustrating adjusted RHI expenditure for most cost-effective technologies (based on assumptions in the 2011 Impact Assessment)

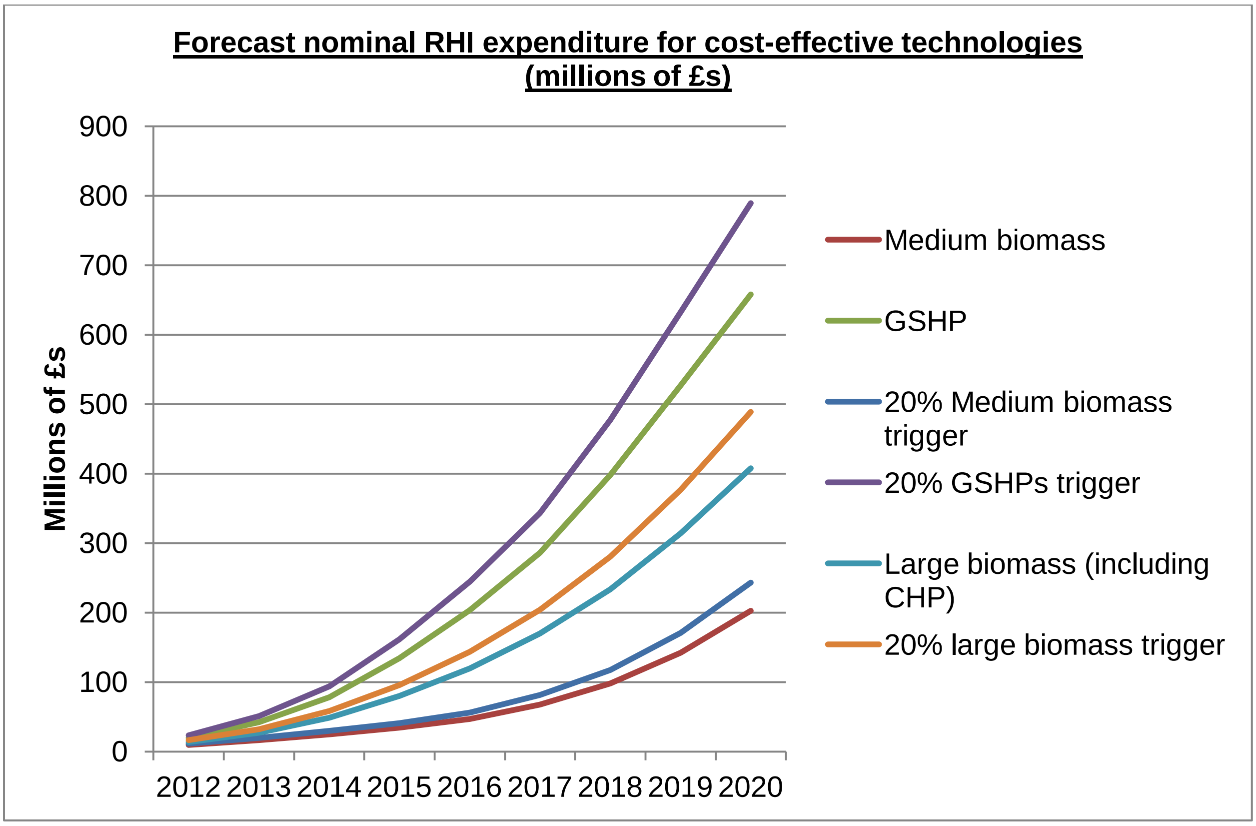
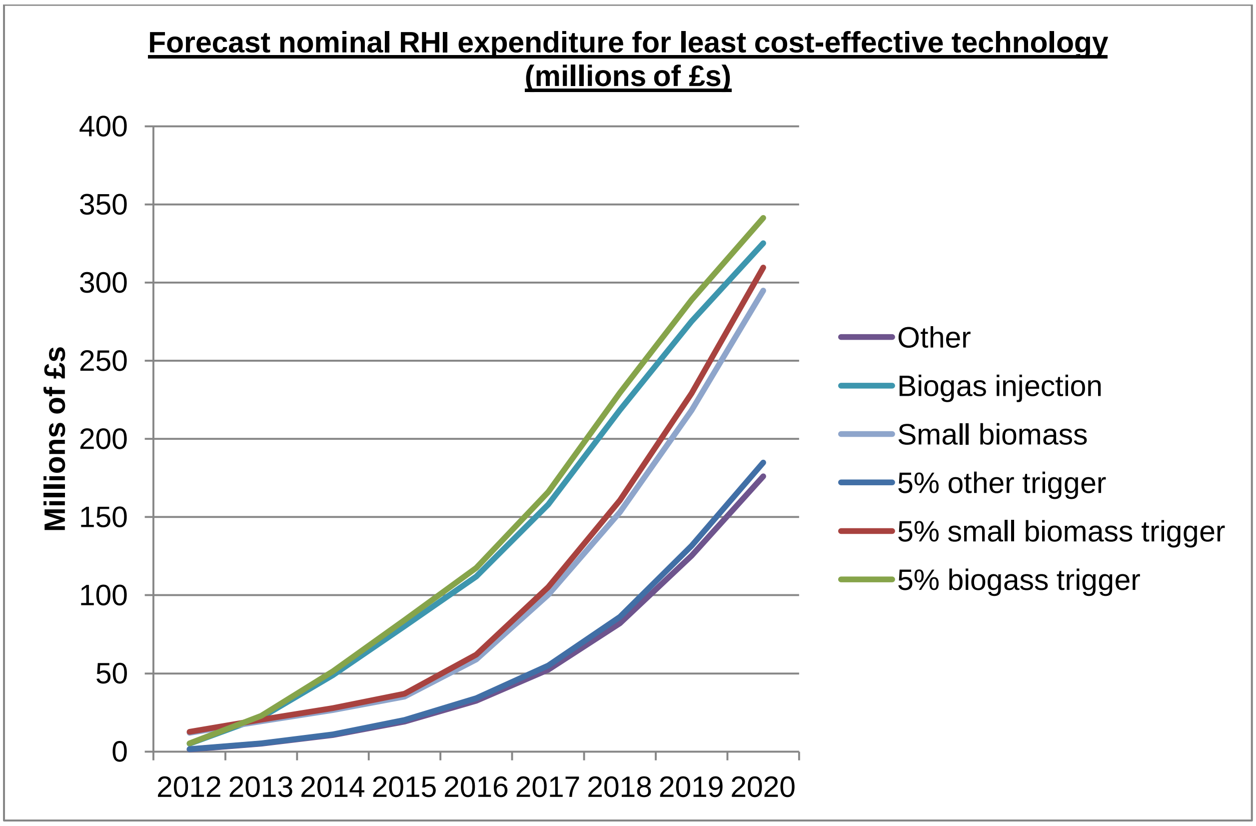


Figure 7: Chart illustrating adjusted RHI expenditure broken for least cost-effective technologies (based on assumptions in the 2011 Impact Assessment)



Note: CHP = combined heat and power, GSHP = Ground source heat pumps, Other = an illustrative allowance to cover other technologies (e.g. Solar thermal) and the possibility of other technologies receiving the RHI (e.g. Air Source Heat Pumps). These curves will be updated.

Therefore, under our three identified scenarios, the impact of degression on the Low deployment scenario would be minimal. The DECC would continue to monitor forecast RHI expenditure but would not degress tariffs in response. Potential investors would also be confident in the tariff rate not being degressed. Under the High deployment scenario, tariffs would be degressed resulting in a lower level of public expenditure and improved value for money (due to reduced rents). Potential investors would also be aware of lower tariff rates and would reduce deployment in response (though we are unsure at this stage by what degree). Under the Central deployment scenario, tariffs would not be degressed but expenditure would be closely monitored by business and Government and there would be a perceived high probability of a degression. This possibility could negatively impact on investment (see below).

- Ensuring certainty

A final benefit of this option is that provided clear rules are set out in advance (like those given in the description of this option), degression is transparent for investors as it would provide clarity to industry about how the DECC monitors expenditure and at what level expenditure would 'trigger' a degression and by how much. With clearly set out rules uncertainty would therefore be reduced which is conducive to achieving greater levels of investment in renewable heat technology. Given finite resources, without the degression of tariffs there would need to be crude forms of intervention (such as a suspension of the scheme for new applicants) to manage the RHI budget which would have a detrimental impact on the market.

Costs

- Lack of certainty on managing the RHI budget

Although degression lowers RHI expenditure relative to a 'do nothing' approach, this policy option does not guarantee that the RHI budget will be met in the event of (significantly) higher than expected deployment (as in the High deployment scenario). For example, if demand is relatively price insensitive to changes in tariff levels, then degression may only have a limited impact in lowering future spending. The existence of an external shock – perhaps a substantial increase in fossil fuel prices or large change in the costs of renewable heat technologies – could cause a spike in uptake for renewable heat technologies. The size of the shock could mean that demand becomes relatively price insensitive to degression changes which would limit the effectiveness of this measure in meeting the RHI budget. This risk is managed by having a potential 10% degression (and even a larger 20% degression) should forecast expenditure be significantly (and persistently) above the baseline forecast.

- Potential risk of "over degression"

If there was a particular month where demand "spiked" causing forecast spending to be higher than baseline forecasts, there is a risk that tariffs could be degressed unnecessarily if demand was to then fall significantly afterwards. Reducing tariffs unnecessarily would undermine the ability of renewable heat to meet the 2020 renewable target and mean important benefits were being foregone. Such 'spikes' in demand would be a risk in both the Low and Central deployment scenarios.

Therefore, deciding the appropriate frequency of any degression involves a trade-off between ensuring there are enough degression "points" in a year so there is enough time to help meet the RHI budget, and ensuring that any degression "point" contains a sufficient level of new deployment to minimise the risk of a potential "over degression".

The uncertainty associated with forecasts and the infancy of the renewable heat market means the DECC would take a cautious approach with degression. In particular, degression "points" would occur every three months. The size of the degressions required are also uncertain given the lack of observed data on behavioural responses to tariff changes. As a result, the DECC would seek to degress by 5% in any one quarter (and by 10% if forecast expenditure was 10% or more over the baseline forecast with the possibility of a larger (20%) degression should demand remain insensitive to the degressions). These issues mean there are a number of difficulties with implementing a degression system. A conservative approach to degression is partly influenced by experience with Feed-in-Tariffs (FITs). Previous FITs policy was to base tariffs on expected rates of return on investment (ROIs) by forecasting these factors, with annual reviews to keep this in check and allow a reasonable level of deployment whilst maintaining value for money. However, it has become apparent that adjusting tariff degression once a year was insufficiently responsive to changes in the deployment factors described above.[9]

- Potentially negative impact on confidence

One of the drawbacks with degression is that the triggers themselves (the curves in Figure 3) could impact on investor confidence. For example, the existence of the triggers and the threat of degression itself could lead to potential investors withdrawing from the market and therefore impact on the 2020 renewables target. The mere possibility of this (in the Central and High deployment scenarios) may have a self-fulfilling impact by causing potential investors to shy away from any investment. This would undermine efforts aimed at meeting the 2020 renewables target. However, there could also be the opposite impact with potential investors anticipating the possibility of degression causing a spike in demand which would impact on the DECC's ability to control budgets and mean demand may not respond to degression in the way predicted.

- Administrative costs

An additional cost associated with this measure is the potential administrative costs to the DECC and the Office for Gas and Electricity Markets (Ofgem) in operating this policy. Although monitoring levels of RHI committed expenditure would happen under a do nothing option, there would be an additional cost in administering the scheme through systems changes, particularly if there are frequent degressions. The

[9] http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/renewable-energy/5391-impact-assessment-government-response-to-consulta.pdf

potentially large number of small degressions in a High deployment scenario could also impose a potential "menu cost" as potential investors would need to regularly review returns to investment.

While these costs are partly implementation costs to Government, they should be compared against the do nothing option. If degression was required, it would be because forecast expenditure is likely to exceed the budget available. Therefore, in the absence of degression, there would still be an cost in monitoring expenditure against budget and implementing a potential suspension of the scheme should spending reach the budget available. In this instance, it is questionable whether there is an additional implementation cost to Government to this policy.

<u>Policy Option 3: Enhanced Preliminary Accreditation</u>

<u>Benefits</u>

- Reduced uncertainty and higher levels of deployment for a given tariff

The decision to invest in a particular form of technology will be determined by the expected return of that investment. Part of that return is the expected subsidy income stream. However, if there is uncertainty with how much the subsidy is worth then this risk will be factored into any investment decision. To the extent that there is uncertainty associated with future levels of RHI, this uncertainty could therefore have a detrimental impact on investment in renewable heat technology and undermine efforts to meet the 2020 renewables target. It could also reduce innovation in renewable heat as more innovative projects tend to have longer lead times and a high cost of financing.

The objective of EPA, if introduced, would be to reduce this uncertainty by guaranteeing a future tariff level (and therefore income stream) to the investor. If, as a result of this uncertainty, the level of investment in cost-effective renewable heat is lower than it otherwise would be, there is a rationale for Government to intervene to ensure deployment is not undermined and public money is spent in the most cost-effective manner. The increase in renewable heat take-up as a result of the reduction in uncertainty means there are potential innovation and carbon benefits from this measure. Feedback from stakeholders suggests uncertainty associated with tariff levels is a key barrier to investing in renewable heat technology.

- Helping to understand potential deployment levels

EPA enables a more accurate picture to be made on potential renewable heat investment and projects in the pipeline thereby aiding policy formulation. By enabling potential investors to 'book' in advance there is also a public finance budgeting benefit as DECC would have a better idea of future expenditure. In a world of degression, all committed RHI expenditure (including expected expenditure from installations with EPA) would be taken into account when assessing if degression is required.

- Other

An added advantage with EPA is it would reduce the length of time in any potential demand response. This is because large installations with long lead times would be most likely to take advantage of the "booked" tariff so if there is a future degression:

- most of the long lead time installations would already be accounted for;
- the rates at which people apply for EPA would respond in real time; and
- in the main, only projects with shorter installations times would be in the pipeline without being 'booked', so applications of installations that were already going ahead would continue for a relatively short period;

Costs

- Lack of certainty on managing the RHI budget

This policy option alone does not enable full budgetary control to be achieved. It is simply a means by which potential investment uncertainty can be reduced (though it can help with gaining a better understanding of future financial pressures).

- Higher cost to Government

There are also potential costs to Government depending on the level of the 'booked' tariff. As discussed previously, if the level of the 'booked' tariff turns out to be higher than the prevailing tariff once the installations are eligible to claim the RHI (due to the degression of tariffs) then this option would involve a higher cost to the DECC than if the investment went ahead under a do nothing approach (though it is questionable whether the investment itself would have gone ahead anyway under a do nothing approach that does not have the tariff guarantee).

- Administrative costs

There is also a potential administrative cost to the Ofgem as administrators of the scheme, particularly the more complex EPA is. We are working on estimating the potential administrative impacts (which the consultation process can help with). It is also possible that there may be potential for gaming and strategic behaviour. For example, if there can be a couple of large investments that materially affect the EPA then it could be susceptible to strategic behaviour by firms. However, there would be policy details to mitigate against this, such as time limits, a robust application process, milestones that would need to be met and on-selling restrictions.

<u>Policy Option 4: Quota / rationing system</u>

<u>Benefits</u>

- Managing the RHI budget

The benefit of a quota / rationing system is that this is the option that provides the most certainty on budgetary control. In effect, the level of RHI expenditure would be allowed to rise overtime until a particular 'trigger' level of spend is reached. At this point the scheme would no longer be available for that financial year for new RHI applicants. The advantage of this system is that it is transparent and relatively straightforward to administer as it would simply involve monitoring expenditure until a 'trigger' point is reached.

If a suspension of the scheme is required, there are three options for when the scheme re-opens:

1. Reopen the scheme at the same tariff rates;
2. Following a review, reopen the scheme at different tariff rates; or
3. Set out degression rules in advance for reopening;

The benefit of (1) is that it would be relatively straightforward to implement and potential investors would have certainty on the tariff the following year (though given deployment in the preceding year, there would be an expectation that the scheme would also close due to high demand in the following year). With options (2) and (3), the DECC would be able to adjust tariffs to ensure public subsidy is adjusted according to changes in the cost of different technologies thereby ensuring an improvement in value for money (the costs of each option are discussed below).

- Small administrative burden

There is also a minimal admin burden as the DECC we would just need to extend the regulations and post the result of its weekly monitoring online. Industry would want to monitor this, but they would also want to monitor progress towards other cost control triggers.

<u>Costs</u>

- Stop-start market

As the RHI budgets are not flexible - spending cannot be banked for subsequent years – any over spend would result in a reduction in the future year's budget. Therefore, a spike in deployment causing a suspension of the scheme would mean the DECC having to close the scheme to new applicants. This would lead to a "peak and trough" deployment and a stop-start market. This shape of deployment brings a lack of confidence for suppliers, investors and more generally, through rapid growth and contraction of supply chains, is considered inefficient.

Of the three options given above for when the scheme re-opens, the drawback with option (1) is that given the scheme is suspended due to demand being higher than expected, if the tariff levels remain unchanged then we would expect – all else being equal – for the scheme to be suspended the following year as tariffs would be too high. This option would therefore accentuate the problem of the stop-start market and does not represent good value for money as public subsidy would be used to finance investments that would have happened anyway. With option (2), while tariffs can be amended to reflect changes in technology, there would be a time delay to when the scheme could be re-opened which would need to be done by amendment. This delay would undermine investment in renewable heat technology and like option (1), would increase the stop-start nature of the market. With option (3), there are complications with implementing a degression system (see costs of degression).

Rationale and evidence that justify the level of analysis used in the IA

We have taken a qualitative approach as the policies considered in this IA are focussed on designing an appropriate framework for budget management and ensuring value for money. Estimating potential monetised impacts was not possible given the wide range of possible outcomes and responses. We are also using the consultation exercise as a call for evidence, particularly with respect to extended preliminary accreditation.

Risks and assumptions

The key risk is the assumption that with degressions demand responds in a way we might expect following degression enabling the budget to be managed. It is also assumed that 'trigger' levels for degression do not become self-fulfilling resulting in either under deployment or spikes in deployment due to the expectation of an impending degression. As identified in the cost section of EPA, there is also a risk with respect to the potential strategic behaviour and gaming of firms which might undermine the objectives of the policy.

Summary

The crux of the issue is whether it is better to exercise cost control through a preset link between uptake and tariff adjustment, or through a system of quotas that lead to temporary suspensions of the scheme and / or adjusted tariffs in response to a suspension. The EPA addresses the issue of policy uncertainty and could help in forecasting expenditure and cost control measures. The degression policy options is considered the preferred option as it means an improvement in value for money and the potential investment disruption associated with the quota system would undermine efforts to meet the 2020 renewables target. The NPV of Policy Option 2 is the costs and benefits multiplied by the probability of it occurring. Under a Low deployment scenario the impact would be small though with Central or High levels of deployment the impact is more significant. In particular, the policy is designed to minimise the risk of over paying investors We are also interested in acquiring further evidence on Policy Option 3 as while recognising the potential for uncertainty resulting in lower levels of investment, we need a better understanding of its significance and cost.

Wider Impacts

The wider impacts of the preferred policy option should be compared against the counterfactual of no cost control mechanism being in place. The RHI is a voluntary scheme and therefore is not seen as producing any impact on business. The policy options considered in this IA are not considered to have any impact on competition, rural issues or diversity. For EPA, while the 'beneficiaries' of this option would most likely be owners of renewable heat installations with longer lead in times, small businesses are not excluded from this measure.

Annex A – the baseline RHI forecast

One of the difficulties with implementing a degression system, and specifically for renewable heat, is the fact that demand varies according to the time of year. Demand will be higher – all else being equal – during the winter compared to the summer. In addition, as renewable heat installations will begin claiming the RHI at different points during the financial year, forecasting the level of RHI expenditure in any one financial year is problematic. For example, suppose a hypothetical installation is expected to generate a constant level of renewable heat equating to £100 of RHI per year (in real terms). Assume that the seasonal nature of demand means £50 of this RHI is claimed from December to February, £25 is claimed from March to May and £25 is claimed from September to November (assume no renewable heat is produced in the summer). In this example, if the claimant of RHI started receiving the RHI in April 2013, they would receive £100 each year in real terms (RHI tariffs are inflation-linked). However, if this claimant began receiving the RHI in December 2013, they would receive £75 in 2013/14 and a £100 each year in real terms from 2014/15. Similarly if the claimant began receiving the RHI in March 2014, they would receive £8.33 RHI in 2013/14 (one month's worth of £25) and then £100 each year in real terms from 2014/15. This means unless each installation begins claiming the RHI on the 1st April each year, the level of RHI spend on any individual installation will be higher the following financial year than the financial year the installation begins receiving the RHI.

A consequence of this – as set out in the recent interim cost control IA[10] – is that the "legacy" impact of deployment (spending in the following financial years on any one installation) will cause RHI expenditure to increase irrespective of further deployment. This means there needs to be sufficient budget available to meet the financial commitments of legacy spending as well as new deployment.

In order to "strip out" the complications of seasonality, ensure there is sufficient budget available to meet "legacy" commitments and support new deployment as well as avoid over spending in any one year, it is proposed that at particular points in time (e.g. quarterly[11]), an estimate is made of all committed RHI spending for the next 12 months. This level of committed spending is then compared against a baseline forecast of spending. The baseline forecast of spending should take into account the fact that new claimants will begin receiving the RHI at different points during the year. To account for this, we have assumed that, on average, installations begin claiming the RHI each October i.e. 6 months into the financial year. This reflects the fact that some installations will claim the RHI from say April and therefore receive 12 months of RHI for that financial year, and some installations will start claiming the RHI in say March and only claim the RHI for one month for that financial year. This baseline is given in Figure 3.

In order for there to be time for a degression of tariffs to impact on demand and spending , this option would mean that every 3 months, committed spending on all installations currently entitled to RHI from that date for the next 12 months (including approved installations, applications and preliminary accreditations from their estimated commissioning date), is compared against this baseline forecast. The baseline ensures there is sufficient budget to support for new installations over and above the 'legacy' expenditure for approved installations.

If deployment (and therefore spending) is above this forecast (and therefore expected budget levels) tariffs are degressed by a particular percentage. This would reduce spending on all new installations relative to a do nothing approach. Degression of tariffs every 3 months continues until forecast spending is brought into line with this baseline forecast.

[10] http://www.decc.gov.uk/assets/decc/11/consultation/rhi-cost-control/5052-impact-assessment-rhi-cost-cons.pdf

[11] The Government response to the consultation on Feed-in-Tariffs Comprehensive Review Phase 2A: Solar PV tariffs and Cost Control also has quarterly degression points.