



Department for
Business, Energy
& Industrial Strategy

THE RENEWABLE HEAT INCENTIVE: SUPPORT FOR BIOMASS COMBINED HEAT AND POWER

Consultation

February 2017

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Contents

1. Introduction	3
Wider RHI policy	3
RHI support for Biomass-CHP	3
Current policy	4
2. Biomass-CHP: Future support	6
Policy Objectives	6
Policy Proposals	6
Consultation Questions	8
Annex A. Assessment of Impacts	9
Impact on potential applicants	9
Impact on Biomass-CHP deployment and RHI Spend	10
Impact on RHI Costs and Benefits	11

1. Introduction

Wider RHI policy

The Renewable Heat Incentive (RHI) supports the deployment of renewable and low-carbon heating technologies. The scheme helps to bridge the gap between the cost of renewable heating systems and the conventional alternatives. The Non-Domestic RHI opened in November 2011. It supports the installation of renewable heating by businesses, charities and in the public sector, and systems supplying heat to more than one domestic property. The Domestic RHI, which provides support to individual households, opened in April 2014.

In November 2015, the Government renewed its commitment to the transition to a low carbon economy by confirming a continued budget for the RHI out to 2020/21.

In December 2016, the Government set out its proposals for the reform of the RHI schemes, following consultation from March – April 2016. These proposals are available at: [RHI Reform - Response to consultation](#).¹

Overall, the reforms will improve the scheme to ensure it:

- **Focusses on long-term decarbonisation:** The reforms promote deployment of the right technologies for the right uses, while ensuring the RHI contributes to both our decarbonisation targets and to the UK's renewable energy target.
- **Offers better value for money and protects consumers:** The reforms will improve how costs are controlled, give consumers more confidence in the performance of particular technologies, address potential loopholes in the scheme, and significantly improve the scheme's value for money.
- **Supports supply chain growth and challenges the market to deliver:** The reforms will drive cost reductions and innovation to help build growing markets that provide quality to consumers and are sustainable without Government support in future.

The reforms are expected to take effect in Spring 2017.

RHI support for Biomass-CHP

The production of heat from solid biomass combined heat and power ('biomass-CHP') plant has always been eligible for support under the Non-Domestic RHI. When the scheme launched in 2011, heat produced by biomass-CHP plant was eligible for the same tariff as heat from solid biomass plant producing only heat ('biomass heat-only plant').

¹ <https://www.gov.uk/government/consultations/the-renewable-heat-incentive-a-reformed-and-refocused-scheme>

However, in December 2012 the Government introduced a specific tariff in support of biomass-CHP plant, set at 4.1p per kilowatt hour (p/kWh). This was significantly higher than the tariff available for biomass heat-only plant larger than 1 megawatt in capacity, which was increased from 1p/kWh to 2p/kWh alongside the introduction of the specific biomass-CHP tariff.

This higher tariff reflected the potentially higher costs faced by biomass-CHP plant compared with biomass heat-only plant, and recognised the benefits, in terms of efficient use of biomass resources, such plant can deliver.

In order to access the biomass-CHP tariff, biomass-CHP plant are required to be certified under the Combined Heat and Power Quality Assurance (CHPQA) scheme. The CHPQA scheme is a voluntary quality assurance scheme for CHP plant in the UK. The scheme confirms whether or not a plant is a CHP plant and assesses the energy efficiency and environmental performance of the system. CHPQA certification of a particular CHP plant does not, however, guarantee that the plant meets specific efficiency or environmental standards, but rather provides an assessment of the system using a standardised methodology.

Current policy

In late 2015 the Government became aware that a high proportion of plant applying for the Non-Domestic RHI under the biomass-CHP tariff were plant which produced a relatively low level of electricity compared to their heat output. Government was concerned such plant do not necessarily face the significantly higher capital costs and / or deliver the comparatively efficient use of biomass (and consequentially relatively high level of carbon abatement) the tariff reflects.

In response, the Government introduced changes in the support arrangements for new biomass-CHP plant joining the scheme from 1 August 2016. The change added a new requirement for these plant to achieve a minimum power efficiency² in order to fully qualify for the biomass-CHP tariff for all eligible heat use. The threshold was initially set at 20%, but reduced to 10% from 1 January 2017 for a transitional period, following engagement with stakeholders.

Under the current rules, plant with a power efficiency of 10% or above continue to receive the biomass-CHP tariff for all heat produced. For plant with a power efficiency of below 10% the level of heat receiving the biomass-CHP tariff reduces proportionately. The remaining heat receives the biomass heat-only tariff for a plant of the same thermal capacity.

There are currently three separate biomass heat-only tariffs: the small biomass tariff for systems with capacities below 200kW, the medium biomass tariff for plant with capacities

² Power efficiency is a measure of the energy content of the electrical output of the system versus the gross calorific value of the fuel input. Its calculation is standardised under the CHPQA scheme and a system's power efficiency is displayed on its CHPQA certificate.

between 200 and 999kW and the large biomass tariff for plant with capacities greater than one megawatt (MW). However, the spring 2017 reforms referred to above will simplify the current biomass heat-only tariff arrangements, replacing the three tariffs with a single biomass-heat only tariff.

The new biomass heat-only tariff will be set initially at 2.91 pence per kilowatt hour (kWh). However, the tariff will also be tiered. Under this arrangement each installation will be eligible to receive the initial 'Tier 1' tariff for a given amount of heat use each year. Beyond this, further heat use will receive a lower 'Tier 2' tariff. The tier 2 tariff will be set initially at 2.05p/kWh. The amount of heat for which a participant will be able to receive support at the higher Tier 1 tariff each year will be set in proportion to the capacity of the biomass system installed, with the amount being equal to the capacity of the system in kilowatts (kW) multiplied by 3,066 hours, giving a figure in kWh.

The example below illustrates how the biomass-CHP power efficiency requirements and the biomass tariff and tiering arrangement are expected to interact, once the spring 2017 reforms are in effect, to determine participant's payments (subject to the final form of the legislation).

Example

A biomass-CHP plant has a thermal capacity of 1MW and a power efficiency of 4%. In its first year of operation it has a heat output of 6GWh (or 6,000,000kWh).

Under the biomass-CHP power efficiency requirements 40% (4/10) of the plant's eligible heat use will receive the biomass-CHP tariff of 4.22p/kWh.

The remaining 60% of the heat will be supported under the biomass heat-only tariff. The plant will have an annual Tier 1 allowance of 3,066,000kWh. For heat use up to this level each year, the portion of heat used which is eligible for the biomass heat-only tariff will receive the Tier 1 tariff of 2.91p/kWh. For heat use beyond this level, that portion of heat use which is eligible for the biomass heat only tariff will be eligible for the Tier 2 tariff of 2.05p/kWh.

The plant's annual payment will therefore be as follows:

Biomass CHP tariff payment: $6,000,000 \times 40\% \times 4.22\text{p/kWh} = \mathbf{£101,280}$

Biomass Tier 1 payment: $3,066,000$ (tier threshold) $\times 60\% \times 2.91\text{p/kWh} = \mathbf{£53,532}$

Biomass Tier 2 payment: $6,000,000 - 3,066,000 \times 60\% \times 2.05\text{p/kWh} = \mathbf{£36,088}$.

Total = **£190,900**

2. Biomass-CHP: Future support

Policy Objectives

The Renewable Heat Incentive (RHI) supports the deployment of renewable and low-carbon heating technologies. Continued support specifically for biomass-CHP, rather than support solely through the standard biomass tariff, must be in line with the aims of reform outlined above.

Current RHI support for biomass-CHP plant is outlined above. This will be simplified by the introduction of reforms to RHI support for biomass, with the introduction of a single biomass tariff. Again, this is outlined above.

The Government is keen to ensure that future support works to encourage deployment of biomass-CHP in areas where it may have a long-term role to play in decarbonisation and where support offers value for money. It is also important to avoid support which constitutes overcompensation and has unintended consequences.

Policy Proposals

The Government believes it is appropriate to limit access to the biomass-CHP tariff for some biomass-CHP plant which produce only a small amount of power. This is on the basis that such plant do not necessarily deliver the benefits in terms of efficient use of fuel, compared with separate generation of heat and power, which the tariff was intended to promote. Furthermore, such plant may not face the higher costs which the tariff was set to reflect. The current use of a power efficiency threshold ensures biomass-CHP plant only receive the biomass-CHP for all of their heat output where they produce a certain amount of power.

To achieve this, the Government proposes to retain the principle of a power efficiency threshold introduced on 1 August 2016 and amended on 1 January 2017, but to increase the current threshold of 10% to 20%. A biomass-CHP plant's power efficiency would be evidenced via its CHPQA certificate.

The Government believes that, while a 20% power efficiency may not be achievable by all types of biomass-CHP plant in all circumstances this option effectively manages the risk that payments to plant producing relatively low amounts of power are out of proportion with the benefits that such plant deliver. Further, the Government understands that there are situations in which biomass-CHP plant may be able to achieve power efficiencies that are close to or exceed 20%. In addition, this arrangement reduces the risk that plant producing

only a small amount of power, and which can access relatively low fuel prices, choose to inflate their heat use solely for the purpose of maximising RHI payments.

Overall, this option manages the risk that plant producing only a small amount of power are overcompensated and that subsidy payments to such plant represent poor value for money to the taxpayer.

The Government considered alternative arrangements, including arrangements based on a heat efficiency threshold or QI threshold. The calculation of both of these is also standardised under CHPQA.

However, given the fact that RHI tariff payments are made on the basis of units of heat generated, the Government believes that the use of a power efficiency threshold to determine the extent to which a plant can access the biomass-CHP tariff in respect of its heat output results in a more balanced incentive than alternative arrangements.

Annex A provides an assessment of the impacts of the proposed change.

Interaction with Tariff Guarantees

The December 2016 Government response announced the introduction of tariff guarantees, as part of the reforms which will come into effect in spring 2017.

Tariff guarantees are intended to help larger, more cost-effective projects to come forward. They do so by providing applicants with greater certainty regarding their eventual tariff earlier in the project cycle.

Applicants who are granted a tariff guarantee in respect of their project will have certainty that the tariff they receive will not be affected by any reductions (degressions) to the tariffs available which may take place between the time at which they are granted a tariff guarantee and the time at which they make a full application to the scheme in respect of their completed project (subject to them meeting the requirements of the tariff guarantee and the eligibility requirements of the scheme).

Biomass-CHP plant will be eligible for tariff guarantees. The December 2016 Government response gives further details of the tariff guarantee process.³

Tariff guarantees are intended only to provide certainty over the tariffs that will be available to a particular project should it be accredited to the scheme. They do not offer a guarantee that a particular project will be eligible for the scheme, or that the scheme's eligibility rules

³ <https://www.gov.uk/government/consultations/the-renewable-heat-incentive-a-reformed-and-refocused-scheme>

or ongoing obligations and terms of participation will not change prior to a full application being made in respect of the project. As such, should any biomass-CHP project be granted a tariff guarantee following their introduction in spring 2017, this would not prevent such a project from being impacted by a change in the power efficiency arrangements, or introduction of similar arrangements, should such a change be made before they make a full application to the scheme. This is because these arrangements determine only the extent to which participants are eligible for support under the biomass and biomass-CHP tariffs, and not the level of the tariffs themselves.

Consultation Questions

Consultation Question	
1.	<p>Do you agree it is appropriate to limit access to the biomass-CHP tariff for plant which produce only low levels of power, and support some of the heat use provided for by such plant under the standard biomass tariff?</p> <p>Yes / No. Please expand.</p>
2.	<p>Do you agree that the use of a power efficiency threshold is the best way to determine the extent to which a plant's heat output is paid for under the biomass-CHP tariff, with the remainder paid for under the biomass tariff? Yes / No.</p>
3.	<p>If 'No' to Question 2, what method would be more appropriate, and why?</p>
4.	<p>Do you agree a power efficiency threshold of 20% is appropriate? Yes / No</p>
5.	<p>If 'No' to Question 4, what threshold would you suggest, and why?</p>
6.	<p>Does your interest in the RHI relate to the operation of the scheme in a particular geographical area? (select all that apply)</p> <ul style="list-style-type: none">a) Englandb) Walesc) Scotland <p>Responses which indicate the respondent's interest relates mainly to the operation of the scheme in Scotland or Wales will be shared with the Scottish or Welsh devolved authorities respectively, unless such respondents explicitly state they do not wish for their response to be shared.</p>

Annex A. Assessment of Impacts

Impact on potential applicants

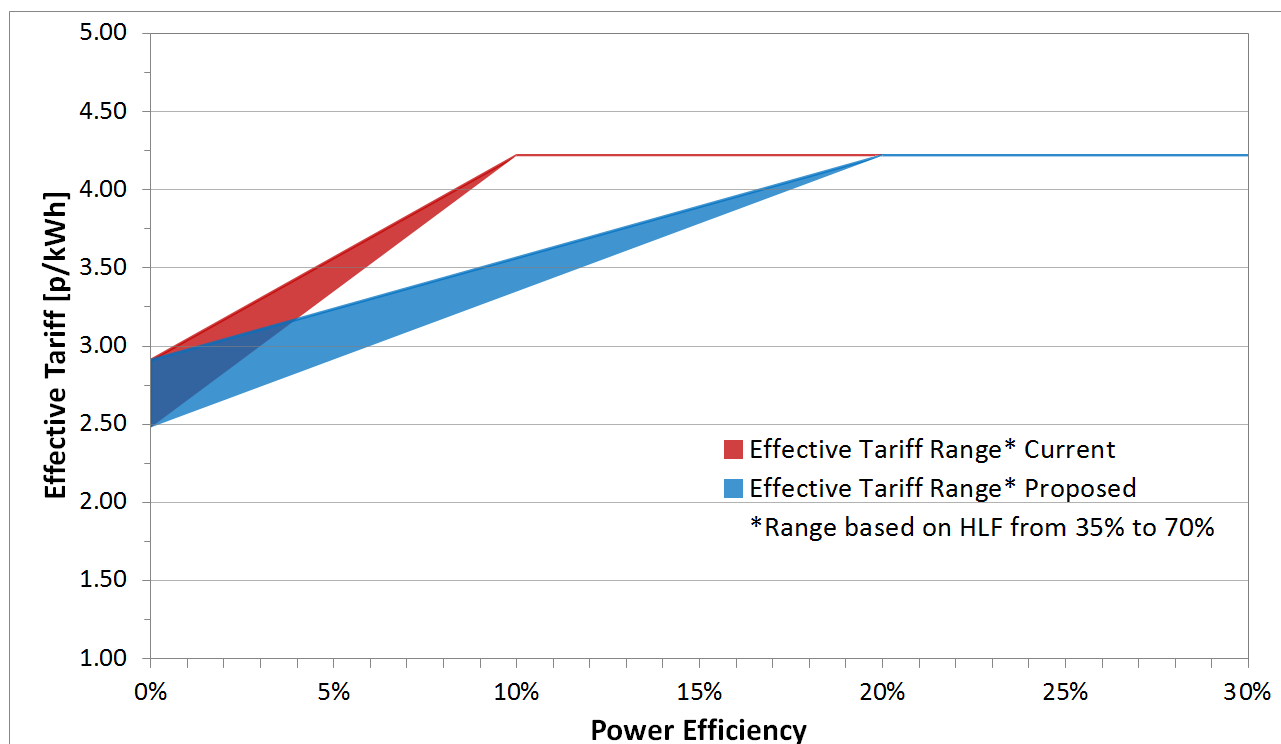
This assessment considers the impact of changes to the power efficiency requirements for biomass-CHP. It considers the current arrangements, a 10% power efficiency (PE) threshold, versus the proposed arrangements, a return to the 20% power efficiency threshold.

The Chart below shows the effective tariff available to biomass-CHP plant with different power efficiencies under the current regulations (a 10% PE threshold) and under the arrangements proposed in this consultation (a 20% PE threshold). The effective tariff combines both the biomass-CHP tariff and both tiers of the biomass tariff to give the value which, if applied to the total heat generated, would give the same total RHI payment as that which is determined under the power efficiency requirements.

This assumes the reforms to the biomass heat-only tariff and tiering arrangements announced as part of the Government response to the consultation on reform of the RHI, published in December 2016, have been introduced, and is therefore subject to the final form of that legislation.

The range (area) on the chart shows the potential impact of different Heat Load Factors (HLF), which are assumed to be independent of the PE of the plant. The higher effective tariff in the range represents a HLF of 35% (i.e. all biomass heat paid at tier 1), while the lower end of the range represents a HLF of 70% (i.e. biomass heat paid half at tier 1 and half at tier 2). This reflects the fact that plant with a lower HLF are paid the higher biomass heat-only tier 1 tariff for a greater proportion of their heat use.

For both the current and proposed cases, at a 0% PE the effective tariff range reflects the prevailing biomass boiler tariff in accordance with the Government response to the consultation on reform of the RHI, published in December 2016, and rises to be equal to the biomass-CHP tariff at the relevant power efficiency threshold. Plant which are above the PE threshold are unaffected by HLFs, as the biomass-CHP tariff is not tiered so all heat is paid at the same rate.



Impact on Biomass-CHP deployment and RHI Spend

This publication does not change the Government’s overall assessment of the likely cost and benefits of the RHI. This assessment should be seen as independent of our recently published Impact Assessment and produced in order to estimate the order of magnitude of impacts of the proposals, but does not address the interdependencies of the scheme as a whole resulting from, for example, scheme wide budget management mechanisms.

There is currently a strong pipeline of applications for biomass-CHP systems coming on to the RHI. The government recognises that many of these systems will be applications seeking to come on to the scheme prior to the changes announced in the Government response and those proposed in this consultation. However, over the past year the biomass-CHP market has developed in a way which means there will likely be continued deployment of biomass-CHP systems in the period 2016/17 to 2020/21.

Assessing the change in deployment likely to result from these proposals is difficult as it involves comparing two hypothetical project pipelines over a four year period. In order to make an order of magnitude assessment of the impact of the proposal, the Government has taken a view as to the likely change in the total affected market over the 2017/18 to 2020/21 period. This has been based on evidence from current statistics on scheme deployment, information on the near term project pipeline gathered from engagement with industry stakeholders, and expert opinion from within Government. The Government also notes that projects which do not come forward and apply as biomass-CHP projects

following changes subsequent to this consultation may still come forward in future and apply to the scheme as biomass heat-only installations.

In total the Government believes the proposed change could mean lower total deployment of biomass-CHP plant over the period up until the end of 2020/21 than if the current threshold of 10% was left unchanged. The Government judges that this reduction could be in the order of between 200GWh and 300GWh of heat generation per year.

At the current tariff, the lower deployment would then result in lower scheme spend of around £10m per year (real £2016/17), compared to the hypothetical case of leaving the current threshold of 10% unchanged.

Impact on RHI Costs and Benefits

For the purpose of translating changes in heat generation into changes to costs and benefits of the scheme, we have used the same characteristics as large biomass projects. This is because we believe that on the whole, biomass-CHP systems with PE lower than 20% will be servicing markets, and display resource cost and counterfactual characteristics, which are more in line with large biomass boiler installations than the large scale turbine systems which form the basis of our typical CHP evidence base. This assumption has not been used in the assessment of the impact on potential applicants above, but is to provide an assessment of the order of magnitude of the change to scheme costs and benefits that are likely to result as a result of the proposals.

Using the assumptions outlined, the loss in benefits from the proposed change would be around 0.3MTCO_{2e} less non-traded carbon abatement over CB4, or 1.1MTCO_{2e} less non-traded carbon abatement over the scheme lifetime (out to 2040/41). The impact on the scheme's Net Present Value (NPV) would be a reduction in the value of carbon abatement of around £60m over the scheme lifetime, a reduction in Air Quality benefits of around £15m over the scheme lifetime, and a resource cost savings of around £50m partly offsetting these. However, the calculation of NPV does not directly include the impact of potential overcompensation effects, or changes to the position on government spend. Overall the proposals are estimated to reduce the NPV of the scheme by around £25m over the scheme lifetime but to reduce Government expenditure by around £150m over the same period (all figures £2016/17).