From:	Moore, Stephen (DfE)
To:	Kate.KELLIHER@ec.europa.eu
Cc:	Adair, Joanne; Smith, Alan; Dukelow, Victor; Murphy, Shane; McMurray, Stephen; McAdams, Jonathan; Marten, Lucy; [redacted] Irrelevant information redacted by the RHI Inquiry
Subject:	DfE answers to DG Comp questions during conference call on 28 February 2017
Date:	06 March 2017 07:59:31
Attachments:	SA 47501 - NI RHI scheme - DfE responses to DG Comp questions arising from 28 Feb Teleconference.pdf image001.png Annex G - 2013 CEPA report.pdf

Dear Kate

Please find attached responses to the questions DG Comp asked during our conference call on 28 February 2017.

When you have had a chance to consider, I will be in the office all day if you would like to discuss.

Stephen

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NEW - 'State aid: A Beginner's Guide for Public Bodies in Northern Ireland' can now be accessed through the DFE Internet site: https://www.economy-ni.gov.uk/publications/state-aid-beginners-guide-public-bodies-northern-ireland

Please consider the environment - do you really need to print this e-mail?

Department for the Economy

Kate Kelliher
State Aid Case Handler
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DG COMPETITION
State Aid: Energy and Environment
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3 March 2017

Dear Kate

SA.47501 Renewable Heat Incentive Amendments Pre-Notification

Please see below responses from the Department for the Economy (DfE) to further questions raised in relation to SA 47504 Renewable Heat Incentive Amendments following our teleconference call on 28 February 2017.

Effect of November 2015 change in the upper limit of the Medium Biomass tariff

As you have correctly identified, a large biomass installation, which was accredited on or before 18 November 2015 and which had an installed capacity of between 100kWth and above but less than 200kWth, would move to the medium biomass tariff, as a result of the changes made in the Renewable Heat Incentive Scheme (Amendment) Regulations (Northern Ireland) 2017.

However, while in theory this does mean that these installations receive a greater level of support from the RHI scheme, there are no installations that fall into this sub-set which are owned and operated by undertakings.

CHP tariff methodology

In June 2013 Cambridge Economic Policy Associates Ltd and Ricardo – AEA report (CEPA) provided advice to the Department on a number of different questions in relation to the NI RHI scheme, including the appropriate tariff levels for CHP.

As the report is 132 pages long and most of the content does not relate to CHP, I am only attaching Annex G, which is the section that deals specifically with the setting of the CHP tariffs.

As you will see CEPA's recommendations are based on its conclusions that the counterfactual fuels for 'new' and 'conversion' CHP installations in Northern Ireland would be natural gas and coal.

During the conference call you explained that, as the inclusion of CHP in the NI RHI scheme was not previously notified, DG Comp has to assess the compatibility of this aid against point 131 of the Guidelines on State aid for environmental protection and energy 2014-2020 (the Guidelines).

We understand that point 131 of the Guidelines state that for energy from renewable sources other than electricity, operating aid will be considered compatible with the internal market if the following cumulative conditions are met:

a) the aid per unit of energy does not exceed the difference between the total levelised costs of producing energy ('LCOE') from the particular technology in question and the market price of the form of energy concerned;

b) the LCOE may include a normal return on capital. Investment aid is deducted from the total investment amount in calculating the LCOE;

c) the production costs are updated regularly, at least every year; and

d) aid is only granted until the plant has been fully depreciated according to normal accounting rules in order to avoid that operating aid based on LCOE exceeds the depreciation of the investment.

Unfortunately, in 2013, when CEPA produced the report, we were not aware of these conditions and hence were not able to ensure the CEPA report was structured in a way that makes it clear the four cumulative conditions in point 131 are met.

Having reviewed the CEPA analysis, we are satisfied that the CHP tariffs would have met all four conditions.

Therefore, if required, we would be happy to revisit the CEPA analysis and provide an addendum to the report that tests the CHP tariffs against the conditions in point 131 of the Guidelines.

However, this would clearly take some time and we are keen to avoid any activities that might delay the Commission from adopting a no objection decision.

As no CHP installations have yet been accredited, if the Commission requires an addendum as outlined above, the Department would be happy to commit to not accrediting any CHP installations until an addendum, to the Commission's satisfaction, has been agreed.

Best Regards

Stephen Moore

ANNEX G: COMBINED HEAT AND POWER

Combined Heat and Power (CHP) or cogeneration offers an efficient means to deliver electricity, heat and cooling. The European Commission under the EU Energy Efficiency Directive[89] (2012/27/EU, Article 14) requires Member States to adopt policies that encourage high efficiency cogeneration.

Renewable CHP is currently being incentivised under the Northern Ireland Renewables Obligation (NIRO). As reported in section 3.2 of this report there are already renewable CHP installations being supported by the NIRO in Northern Ireland - Balcas being one example. In addition under current plans an additional 50GWh per annum of renewable heat will be delivered from 2015 onwards.

We now consider what an appropriate tariff for biomass CHP might be. As for other technologies, we also consider potential eligibility standards and requirements and the most appropriate tariff bands.

G.1. Specific tariff for biomass CHP

As a technology that supplies both heat and electricity, CHP receives support through the NIRO. However, DETI has proposed[90] that the 0.5 ROC uplift for renewable CHP projects will end in September 2015. Projects accredited after this date would take the relevant electricity only ROC level together with the relevant Renewable Heat Incentive tariff in place.

In its consultation, DETI committed to determining an appropriate RHI tariff above 1MW for CHP. We note that in GB, a tariff of 4.1p/kWh was proposed last year but is currently under review.

Eligibility standards and requirements

The current eligibility standards for the NIRO require that in order to claim the CHP uplift of half a ROC, schemes must demonstrate that they are good quality CHP. This is determined via accreditation under CHPQA[91].

Under DECC's proposals on CHP in GB, CHPQA validation will be required to claim a dedicated RHI tariff for CHP. We would therefore recommend that for consistency and quality assurance that the same principles are adopted by DETI.

We propose that all forms of renewable CHP are considered, including bioliquid engines and biomass steam turbines. We have assumed that CHP installations of up to 3 MWe capacity will be bioliquid and larger schemes biomass steam turbines, as typically seen in practice. While the bioliquid resource is unlikely to be sourced from Northern Ireland there exist options for imports from UK or European ports such as Rotterdam. Concerns exist surrounding the sustainability of bioliquids, but this is mitigated through the European sustainability requirements, which are already embedded in UK regulations.

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[89] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:315:0001:0056:EN:PDF

[90] http://www.detini.gov.uk/niro_2012_consultation_on_solar_pv_and_biomass.pdf

[91] http://chpqa.decc.gov.uk/about-us/

Potential

There are a handful of industrial CHP sites utilising fossil fuel in Northern Ireland that given appropriate support could switch to being renewable CHP. One large coal fired CHP plant in Northern Ireland could alone deliver 237GWh per year of renewable heat.

Some of these sites will be installing a new boiler, while others will be converting an existing one. The capital costs associated with conversion to operate on biomass are significantly less than for a new CHP plant. We therefore recommend a separate tariff for CHP conversion.

The methodology used for determining a Northern Ireland specific CHP tariff has for consistency followed the same principles as in GB for DECC. The complexities associated with different income streams from electricity generation and incentives, and the higher capital cost of CHP compared to heat only installations, mean that a number of specific assumptions based upon the CHP market have been incorporated. The differences in the assumptions to the main heat only technology modelling are described below.

Key modelling assumptions

The CHP investment lifetime is assumed to be 10 years while the plant lifetime is 20 years. The 10 year investment lifetime represents the time period over which the investment is typically required to be recovered. A typical maintenance contract will be for 10 years following which a major overhaul and renewed maintenance contract would be required.

The revenue from ROCs for electricity generation is included and factored into the analysis.

A discount rate of 12% has been assumed which is in line with the discount rates assumed for other technologies in this report and the RHI methodology for CHP in GB.

It is assumed CHP installations below 10MWe in size would be owned and operated by the site owners. This includes the majority of potential CHP sites in Northern Ireland. Under the owner operator model, the site benefits from the full value of the displaced boiler fuel whereas a third party developer would need to sell the heat to the site at a discount. So the value of heat is higher where a site owns and operates the CHP. The required tariff would therefore be 3.5p/kWh based on the actual counterfactual fuels. This would provide 327GWh per year of heat from new CHP uptake. The RHI cost would be £11.4 million/year.

The size at which a third party would be involved varies according to the nature of the site hosting the CHP but this is unlikely for bioliquid engines (applicable to the large commercial segments), somewhat likely for biomass schemes with an electrical capacity up to 10MW and highly likely for >10MWe biomass schemes. We have assumed all biomass schemes under 10MWe would be owner operated in the tables below. However, we have also shown the results of a sensitivity which assumed that <10MWe biomass CHP schemes are developed and operated by a third party.

16 of the 17 small industrial sites identified are suitable for new CHP (one having existing gas-fired CHP) and three of the large industrial sites above are suitable. These are modelled individually.

Differences to GB CHP modelling

The key differences between our analysis and the CHP modelling undertaken for GB are:

- the different energy prices for electricity, gas, oil and biomass that represent those encountered in the Northern Ireland market;
- there is a higher degree of segmentation, particularly for commercial sites, as the GB model focuses entirely on CHP rather than a range of technologies. At the larger scale the limited number of industrial sites in Northern Ireland meant that sites could be modelled individually; and
- the GB model includes tax but this has been omitted in this study as for other technologies.

Choice of Counterfactual

The industrial sector is where the greatest potential for CHP in Northern Ireland lies. Of the 17 sites listed in the small industrial sector, 15 are estimated to be connected to the gas grid. The industrial sector in Northern Ireland therefore has significantly different counterfactuals compared to the energy mix of Northern Ireland as a whole where oil dominates as a heating fuel. Given the predominance of sites connected to the gas grid with CHP potential we have looked at the implications in terms of support required and market take up of the counterfactual, depending on whether the counterfactual is gas or oil.

It should be noted that the CHP conversion tariff is based on the one large site currently considering conversion whose counterfactual is coal.

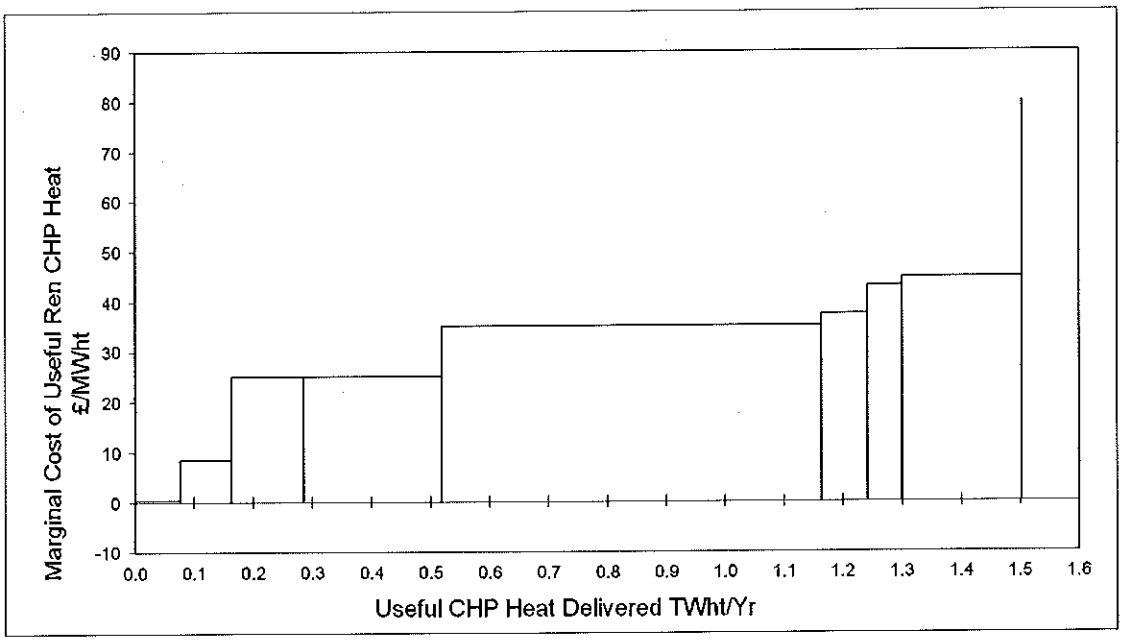
G.2. New CHP modelling results

We have based the tariff levels upon the actual counterfactual fuel for each segment. The approach taken here follows the approach for other technologies, in terms of setting the tariff based on a reference installation.

Third party biomass CHP Development

Based upon market experience it is assumed that in the majority of cases, a third party develops and operates the industrial biomass CHP schemes. The median segment representing the reference installation is comprised of gas-fired large commercial buildings. It would require 3.5p/kWh (£35/MWh) to be cost effective.

Figure G.1: Biomass CHP supply curve



If the tariff is set based on an oil counterfactual, the level of support required would decrease to 0.8p/kWh. The tables below present the results of the CHP modelling in terms of uptake expected for these two different tariffs.

Table G.1: Estimated CHP deployment based on 3.5p tariff (gas counterfactual)

Technology	Tariff	Sector	Counterfactual Fuel	Within Model	Economic Potential by 2020	Estimated CHP Heat by 2020
	p/kWh				GWh/Yr	GWh/Yr
New CHP	3.5	Large Commercial	Oil	Y	355	89
New CHP	3.5	Small Industrial	Oil	N	163	81
New CHP	3.5	Large Industrial	Oil	N	77	77
New CHP	3.5	Large Commercial	Gas	Y	-	-
New CHP	3.5	Small Industrial	Gas	N	320	80
New CHP	3.5	Large Industrial	Gas	N	-	-

This gives a total estimated CHP heat by 2020 of 327GWh per year. However, much of this relates to the large commercial sectors which are already included in our economic model. There may therefore be significant displacement if there is significant uptake of CHP in the large commercial sector. As a conservative assumption, we have therefore assumed that if CHP is installed in a sector that overlaps with the model, it displaces other technologies such as biomass and so is not additional.

The estimate for additional renewable heat from CHP (not competing with other technologies) by 2020 is 238GWh per year, at a total RHI cost of around £8.3m per year.

Table G.2 below shows the estimated uptake with a tariff based on an oil counterfactual.

Table G.2: Estimated CHP deployment based on 0.8p tariff (oil counterfactual)

Technology	Tariff	Sector	Counterfactual Fuel	Within Model	Economic Potential by 2020	Estimated CHP Heat by 2020
	p/kWh				GWh/Yr	GWh/Yr
New CHP	0.8	Large Commercial	Oil	Y	-	-
New CHP	0.8	Small Industrial	Oil	N	163	81
New CHP	0.8	Large Industrial	Oil	N	77	-
New CHP	0.8	Large Commercial	Gas	Y	-	-
New CHP	0.8	Small Industrial	Gas	N	-	-
New CHP	0.8	Large Industrial	Gas	N	-	-

This gives a total estimated CHP heat by 2020 of 81GWh per year, at an annual RHI cost of £0.65 million per year. This is for one small industrial site included.

The estimated CHP heat by 2020 is based on constraints to CHP uptake that have been applied. There are challenges in installing a significant number of large CHP installations by 2020. We assume that no significant planning developments would start until the precise tariff levels and regulations are finalised. A large industrial CHP plant is likely to require two years planning and a further two years until the scheme is fully operational, this means that schemes are unlikely to be come to fruition until around 2017-20. Under the oil scenario we assume two industrial plants plus one CHP conversion as being realistic by 2020. With an RHI support level of 3.5p/kWh, constraints in terms of deployment potential mean that much of the economic potential is not realistically achievable by 2020.

Third party operator biomass CHP Development Sensitivity

If due to the magnitude of capital outlay and complexity, large CHP schemes would be owned and operated by a third party who would sell heat and electricity to the site and would sell the heat at a 20% discount compared to the cost of the site generating it themselves. Thus there is a penalty for larger schemes in terms of income and this has a significant impact on the marginal heat costs. As the value of the heat to the operator is lower under third party operation then the tariff required would be higher. New CHP (based upon the actual counterfactual fuels) which would provide 327 GWh/Yr would require a tariff of 4.3p/kWh with third party development. This sensitivity illustrates the higher support required for third party operator CHP schemes.

CHP conversion results

We define CHP conversion as the modifications required for an existing steam turbine based CHP facility, using conventional fuels (i.e. gas, coal or fuel oil), in order to switch to renewable fuels. This should be limited to biomass and bio-liquid fuels. The main modification required is

the replacement of the fossil fuel fired steam boiler with a renewable steam boiler. The electricity generating components of the CHP installation would not require any amendments

The CHP conversion tariff has been based around one large coal fired CHP plant in Northern Ireland. The modelling results indicate a tariff of 1.7p/kWh is required to support the plant to switch to renewable heat.

Table G.3: Proposed tariff for CHP conversion

Technology	Tariff	Segment	Counterfactual Fuel	Within Model	Economic Potential by 2020	Estimated CHP Heat by 2020
	p/kWh				GWh/Yr	GWh/Yr
Conversion	1.7	Large Industrial	Coal	N	237	237

The advantage of CHP conversion is that this could take place relatively quickly and be in operation by around 2015. Since it is not in a sector covered by our model, it would be additional to the renewable heat supported by the tariffs shown in the model. Note that it would have a cost of around £4 million per year[92], which is a significant proportion of the overall budget, particularly in earlier years.

[92] 0.237TWh=237 million kWh. Multiplied by a subsidy of 1.7p (£0.017) gives £4,029,000.