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Subject: RHI- Development of Long Term Approach- Proposed Analysis
Date: 20 January 2017 11:22:42
Attachments: [RHI Modelling Outline Work Programme.DOC](#)

Stuart

Please see attached short note setting out the proposed analysis to inform the development of a long term approach for the non-domestic RHI scheme.

Based on your previous experience, I would be grateful for any views/comments/suggestions? In particular, you will see that I have identified the need for external consultancy support and I would be grateful for any insight, including business cases or Terms of Reference that we could work from.

Happy to discuss

Paul

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DEVELOPMENT OF LONG TERM SOLUTION FOR NON-DOMESTIC RHI SCHEME- PROPOSED ANALYSIS**Introduction**

The purpose of this note is to set out the proposed analysis to inform the development of a long term payment framework to ensure that the Non-Domestic Renewable Heat Incentive (RHI) scheme is financially sustainable over the longer term. The solution should also represent Value for Money (VfM) and be consistent with the original objectives of the scheme i.e. to offset the additional cost of installing and operating renewable technology, compared with the alternative fossil fuel.

The primary focus is on medium (20-199kW) Biomass boilers as the predominant fuel type and boiler size under the scheme. The analysis is expected to be conducted over the period January-June 2017 through a mixture of in-house and external consultancy support.

Proposed Analysis

There are four main parts to the proposed analysis as set out below:

(a) Assess current position on non-domestic RHI scheme**(i) Breakdown of installations/ tariff payments**

In the first instance it is important to examine the characteristics of the participants on the scheme to see if there are any implications for the way forward. For example, the level of usage by scheme participants to date is significantly in excess of that which was assumed when originally setting the tariffs, which has been one of the principal reasons why costs have been substantially higher than expected.

This initial analysis is expected to include examination of the following details in respect of applications/payments:

- Status- applied/pending/accredited/withdrawn;
- Fuel/tariff e.g. Biomass, Solar, CHP;
- Installations per site/business;
- Size of boiler (kW);
- Sector (Industry);
- Location (Postcode);
- Previous fuel type- compare with GB to see if rationale for NI specific approach was correct;
- Usage-hours/payments e.g. what % more than 40% load factor
- Usage- variation from application and between quarters; and
- Variations in implied IRR.

It should be noted there will be limited data available in respect of the behavioral impact of the revisions to the tariffs in 2017-18, to inform the development of the longer term approach.

- (ii) Review of forecasts of heat generated for remainder of RHI- different scenarios:

It is also important to review the most recent projections of the overall cost of the scheme over a 20 year period. These are currently based on rolling forward average usage levels to date with tariff levels increased in line with projected inflation (RPI). However, alternative assumptions could result in significantly different future cost estimates in the context that average usage levels to date are evolving as more meter readings are provided¹- see Chart A1 in Annex A.

The impact of different inflation assumptions can be seen in applying the RPI rates produced by the Office for Budget Responsibility (3.0% long-term) rather than the rates used in the projections (1.6%) quoted in the NIAO report. This is estimated to increase the cost of the scheme by around £130 million over 20 years. Alternatively, if usage levels fall by 1pp per year from 2020-21 through attrition (fall in boiler efficiency and impact of normal business churn), this would be expected to reduce the 20 year cost by £70 million- see Chart A2.

This analysis would involve the following:

- Review of latest projections as basis for £1.15 billion figure;
- Incorporation of latest meter readings/invoices;
- Review treatment of pending applications- estimate based on average of similar boilers;
- Approach to extrapolating trends to date;
- Examination of the potential to incorporate attrition rates in projections- the operation of boilers at high load factors would be expected to reduce efficiency and life expectancy; and
- Production of a range of forecasts depending on variations in assumptions.

- (iii) Review of future available AME budget- different scenarios

In addition to examining the projected expenditure on the non-domestic RHI scheme there is also a need to consider the expected level of funding from the NI Executive population based share (2.85% for 2015) of the projected expenditure on the scheme in the rest of the UK. In particular, whilst there are annual figures for the planned level of spend on the UK RHI scheme up until 2020-21, it will be important to review the calculation underpinning the estimated £660 million estimated NI budget for the scheme over the entire 20 year period.

¹ The 2017-18 Business Case was based on heat generated figures for 36 installations in 2013, 225 installation in 2014, 764 in 2015 and 1,790 in 2016.

(b) Review all elements of 2017-18 tariff to make sure that they are reasonable:

The 2017-18 payment framework for the non-domestic RHI scheme is based on a number of different elements as set out Table 1 below.

Table 1: Basis for key elements of 2017-18 RHI Payment Framework

Element	2017-18 Value	Basis
Tier 1 Tariff	6.6p per kWh	5.9p per kWh figure from 2012 CEPA report updated in line with RPI inflation
Tier 1 boundary	1,314 hours	Approach in GB scheme
Tier 2 Tariff	1.5 p per kWh	Tier 2 Tariff in GB scheme ¹ and estimated additional cost compared with LPG for a poultry house estimated by DARD
Usage upper limit	400,000 kWh	DARD estimate of upper limit of the expected annual heat requirement for a typical poultry house.

1. GB Tier 2 Tariff was 1.58p per kWh for small (less than 200kW) biomass boilers accredited between 1 April 2015 and 1 July 2015 falling to 1.18p per kWh for those accredited between 1 July 2015 and 1 October 2015.

However, a review of the 2012 CEPA report would suggest that the Tier 2 tariff should be around 0.8p per kWh, broadly in line with the latest GB tariff², which explains why the Internal Rate of Return (IRR) for the 2017-18 framework increases beyond the 12% Cost of Capital objective between the Tier 1 boundary and the usage upper limit- see Chart A3. Furthermore, in setting an upper usage limit based on poultry sheds, there is the possibility that a higher limit may be justified for other activities.

In the context of the uncertainty regarding capital and operating costs when setting the original tariffs for the non-domestic RHI scheme, it will be important to review the underlying assumptions to ensure that they are still fit for purpose. For example, reducing the Cost of Capital objective from 12% to 8% would reduce the Tier 1 tariff by over 1p per kWh. On this basis, the following aspects of the original tariff calculations will be updated:

Tier 1 Tariff

- Oil/Biomass Capital costs
- Cost of Capital
- Biomass Barrier costs
- Projected load factors/life expectancy

Tier 2 Tariff

- Oil/Biomass Prices;
- Oil/Biomass boiler efficiency rates including impact of different load factors over time;

² 0.78p per kWh Tier 2 tariff for small (less than 200kW) biomass boilers accredited after 1 January 2017.

- Oil/Biomass- ongoing operating costs;
- Biomass- ongoing Barrier costs; and
- Projected load factors.

This work will also examine how the inflationary uplift is applied i.e. should all aspects of the tariff be subject to inflationary uplift and if so, would an alternative to the RPI be better, such as the CPI (1pp lower than RPI per annum) which is used for new applications in the rest of the UK.

In line with approach to setting original tariff this part of the analysis will require external consultancy advice. In addition, an important aspect of the subsequent consultation process will involve seeking the evidence based views of scheme participants in respect of their actual capital and operating costs.

(c) Identify and consider revised payment options for the scheme in 2018-19, consistent with projected AME budget allocations and the original objectives of the scheme:

Although affordability and VfM considerations would suggest that the main options for the long term payment framework should be based around variants of a tiered tariff, it will be important to consider other options, as set out below, with the scope for others to be suggested as part of the consultation process:

- Tariff based approach (Tier level, Tier Tariffs, Usage Cap, inflationary uplift);
 - i. Continuation of 2017-18 Tariffs
 - ii. Tariff based on review of key components i.e. from (b)
 - iii. GB payment framework
- Buy out- based on achieving fair return- one off payment;
- Hybrid- based on one-off payment to provide fair return for additional cost of capital investment combined with Tier 2 tariff;
- Change in the calculation of the inflationary uplift;
- Closure;
- Incorporation within GB scheme; and
- Separate compensating levy, dependent on outcome of any legal challenge to proposed changes for 2017-18.

Each of the options will be examined in respect of the following aspects

- Amount of payment;
- Implied IRR;
- Strengths/Weaknesses- affordability, ease of implementation, economic impact, environmental impact etc; and
- Risks- legal, State Aid, scope for gaming.

In order to facilitate the consideration of options, the financial model previously used to inform the development of the approach for 2017-8 will be adapted to the format set out in Annex B.

(d) Identify and consider options to recoup excess returns previously received by some scheme participants

Whilst the primary focus is on the approach going forward, the overall level of payments and return on investment over the 20 years of the scheme will depend on the levels of payment that will have been made by the end of 2017-18. In particular, the available evidence would suggest that the average installation accredited before November 2015 is currently receiving payments equivalent to a rate of return around 60%.

It will therefore be important to consider whether it is appropriate to seek to recoup this previous excess payment and if so, what would be the best way to achieve this objective. This is expected to involve the following:

- Estimate level of previous excess returns for individual installations and in aggregate compared with:
 - Amount received under a fair rate of return
 - Amount received under 2017-18 Tariffs
- Identify options to recoup funding
 - One-off/phased recovery payment
 - Adjustment to future RHI payments- different phasing
- Strengths/weaknesses of each option
- Risks- legal, State Aid, budgetary treatment.

Outputs

The intention is that a paper will be produced for each of the 4 elements with the relevant parts incorporated into a Business Case or Consultation document.

Chart A1: % change in Heat generated between 2015 and 2016 for installations with readings for both years (c750 installations) excluding outliers.

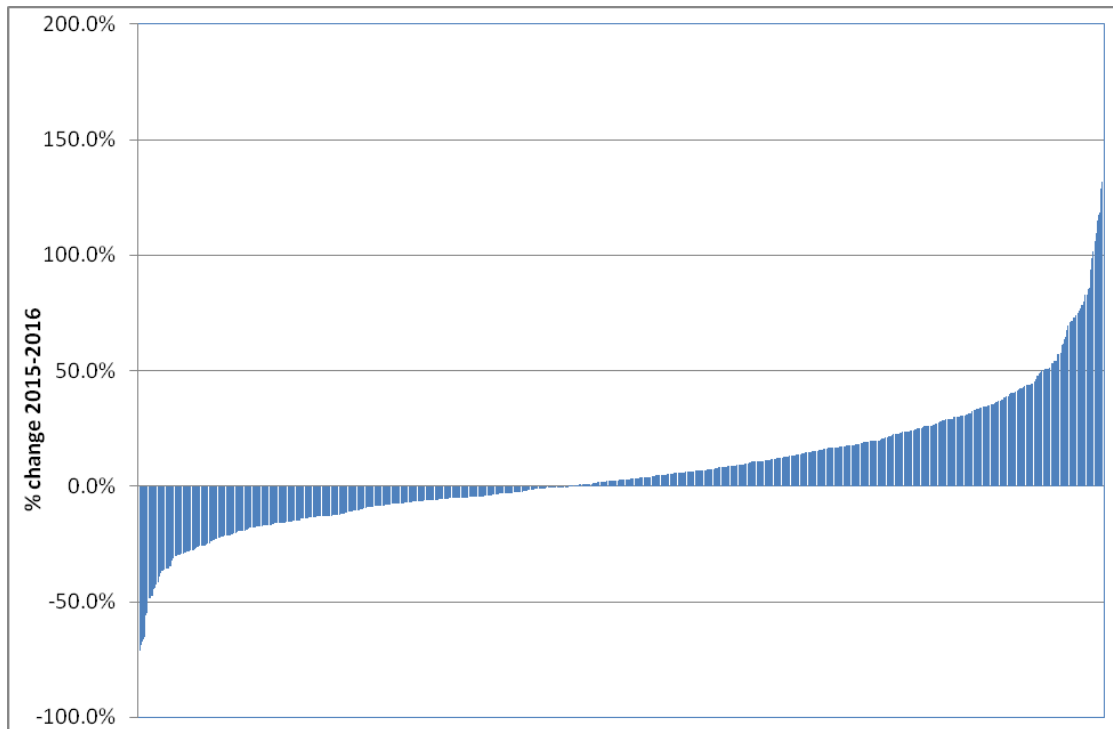


Chart A2: Projected Gross Cost of Non-Domestic RHI Scheme (£)

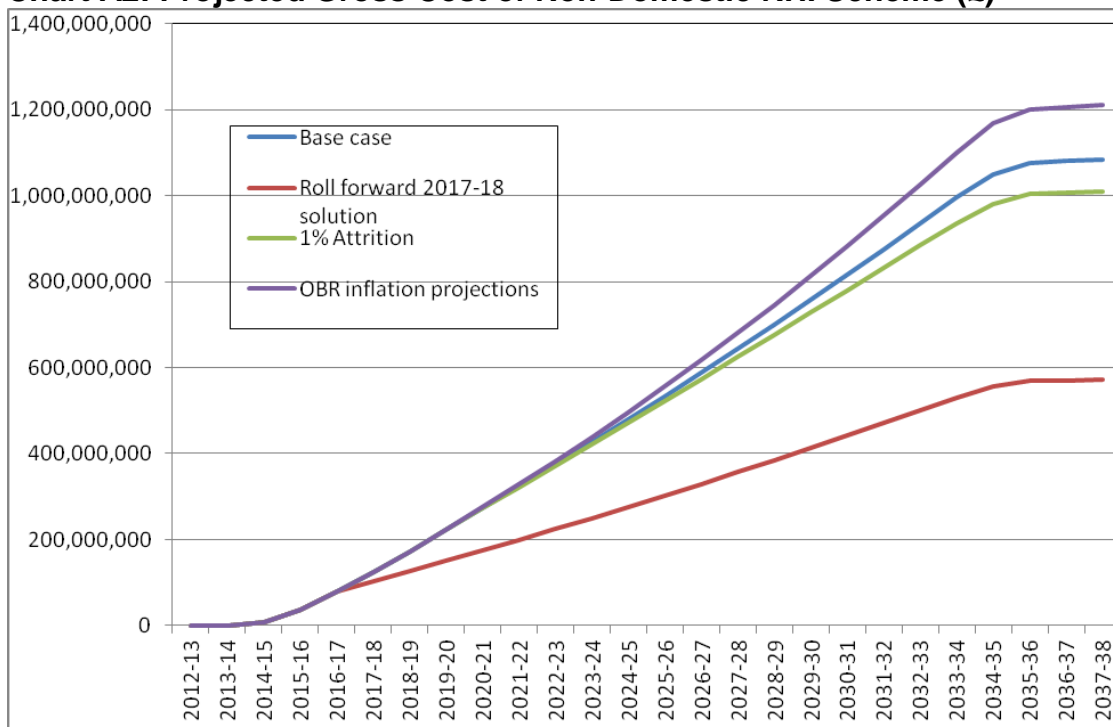
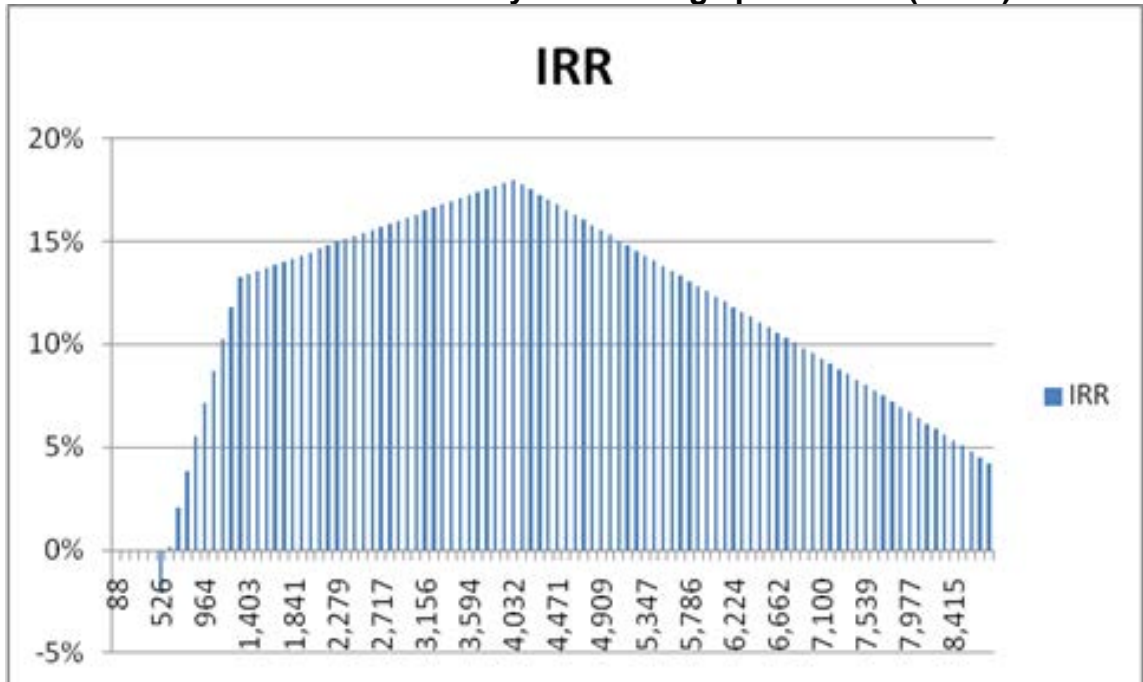


Chart 3: Internal Rate of Return by hours usage per annum (99kW)



Modelling the Options for the Long Term Solution for the Non-Domestic RHI Scheme- based heavily on spreadsheet developed by Shane/Alan.

Inputs

Characteristics of each installation (Boiler size, Accreditation Date, number of meter reading)

Accruals to 2017-18 per installation

Annual Heat usage to 2016-17 per installation

Fixed Assumptions for Renewable vs Oil (based on (b))

CAPEX including barrier cost by Boiler size

OPEX including barrier cost by Boiler size

Efficiency by Boiler size

Fuel costs

Cost of Capital

Lifetime

Variables

Tier 1 tariff

Tier 1 upper limit (operating hours)

Tier 2 tariff

Upper usage limit

Inflation per annum

One-off payment by Boiler size

Attrition rate

Outputs

RHI payment per installation per annum (as well as average, total and typical in "results" sheet)

Implied IRR per installation (a) including previous payments and (excluding previous payments (as well as average, total and typical in "results" sheet)