

**From:** [Clydesdale, Alison](#)  
**To:** [McCormick, Andrew \(DFE\)](#)  
**Cc:** [Cousins, Heather](#); [McMurray, Stephen](#); [Wightman, Stuart](#); [Dukelow, Victor](#); [Smith, Alan](#); [Murphy, Shane](#); [Woods, Michael \(DFE\)](#); [McCann, Brendan](#); [McFarlane, Iain](#); [Coyne, Terence](#); [Conliffe, David](#); [McEvoy, Colette](#); [Marten, Lucy](#)  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 26 September 2016 21:44:29  
**Attachments:** [RHI tariffs \(revised\).docx](#)

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Andrew

I think we will need further economist advice on this, however Alan is on leave for the rest of this week.

I have attached his advice as of last week .

The business case does confirm that “This is the fuel cost in 2012. The model takes account of expected future fuel costs in determining tariffs”.

Perhaps I am oversimplifying it but is the purpose of tiering not to address over usage –at 17% usage the rate of return has been achieved at a subsidy level 5.9 p/kWh – but it costs 4.75p to produce an additional kWh so the over incentivisation stems from a profit of 1.15 p /kWh being available because of the inability to limit usage.

The only deterrent from overuse if a tiered tariff was not being used would be that the tariff would be less than the absolute fuel costs.

So in other words a mechanism to limit usage was always needed.

The additional piece of consultants advice of 2012 that determined the 5.9 might give us the assumptions about the future costs of fuel. I will take a look at that.

Perhaps Shane or Victor could advise further ?

Alison

---

**From:** McCormick, Andrew (DFE)  
**Sent:** 26 September 2016 18:06  
**To:** Clydesdale, Alison  
**Cc:** Cousins, Heather; McMurray, Stephen; Wightman, Stuart; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DFE); McCann, Brendan; McFarlane, Iain; Coyne, Terence; Conliffe, David; McEvoy, Colette; Marten, Lucy  
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- However, **subsequent movements** in the prices of oil and biomass changed this balance and it was those market movements, not the absence of tiering that created the problem of overincentivising.

Feel free to check with Emer that I have grasped this accurately.

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	Cost of Biomass p/kWh	Cost of Oil p/kWh
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[Please add any other key stages that would be important]		

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Many thanks.

## RHI Biomass tariff

This analysis looks at the small commercial biomass RHI tariff only. Other RHI tariffs are not assumed to have the same unfavourable behavioural incentives.

### 1. Chronology

#### 3 June 2011 – advice from DETI economist on proposed RHI scheme

Economist advice to energy division stated that, inter alia, ‘more information should be provided to explain the tiering issue and why it has not been adopted for NI’.

#### 28 June 2011 CEPA / AEA produce final report for DETI on the RHI.

Final report recommends subsidy rate of 4.5p for small biomass boilers (less than 45kW) and 1.3p for medium biomass boilers (greater than 45kW).

The tariff setting methodology had three general principles:

- Renewable installations are divided depending on the type of technology and size of installation;
- Within each banding a reference technology is chosen to develop a consistent tariff across technologies and scales; and
- The net costs (difference between capital and operating costs of fossil fuel counterfactual and renewable alternative) are calculated and the tariff determined

The reference technology chosen was a 20kW boiler with a load factor of 17%. Wood pellet fuel cost was 4p.

“The reference installation for a particular technology size is the one with the average cost for that technology size over all the sites where it could be installed”.<sup>1</sup>

The consultants “considered tiering for the NI RHI rates, using the DECC approach. However, when setting the NI recommended levels for this report, the incremental fuel cost was higher than the subsidy rate in all cases. Therefore no tiering is provided in this report.” (paragraph 6.7.1)

Note that for small boilers(less than 45kW) this information is **incorrect**. Under the proposed tariff they would receive 4.5p/kWh which is greater than the incremental fuel cost of 4.39p/kWh. The proposed tariff might not have been enough to cover total running costs which would have added approximately 0.9p to fuel costs.

#### 5 July 2011 – further economist modelling (on domestic tariff – so not relevant to non-domestic).

“Basically I agree with CEPAs conclusion on the domestic tariff (assuming their assumptions are correct), however our methodology appears to be different e.g. not sure what they're doing with fuel costs”.

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<sup>1</sup> Defined in state aid addendum document

**20 July 2011** – Ministerial consent for public consultation on scheme which ended **on 3 October 2011**.

Consultation findings on Tariffs, Banding and Technologies: Respondents, whilst accepting the Departments tariff setting methodology, argued that the fact tariffs were lower than those in the GB scheme meant Northern Ireland was disadvantaged. Some issues were also raised about the technology assumptions used in generating tariffs, the proposed banding ranges and the list of technologies incentivised.

Officials re-engaged with consultants who designed the RHI tariffs and model to consider the issues raised and, if necessary, adjust tariffs and banding. It should be noted however that it is very unlikely that tariffs will ever match those proposed in GB given that the Northern Ireland tariffs are designed against a counterfactual position of oil rather than gas. As oil is more expensive it requires less incentive to switch to renewable heat.

#### **16 February 2012 Addendum to RHI submitted by CEPA / AEA**

The addendum revised the tariff for biomass.

It should be noted that the tariff was determined by modelling both capex and opex. Opex was determined as total running costs (O&M costs and fuel costs) and not simply fuel costs. The following table shows the difference in the assumptions behind the tariffs in the original proposal and the final tariff adopted following consultation.

	Capex (£/kW)	Opex ((£/kW/year)	Efficiency (%)	Load factor (%)	Size (kW)	Lifetime (years)	Fuel cost (p/kWh)	Barrier costs (£)	Ongoing barrier costs (£/year)
Original Biomass	380-397	11.5	85	17	20	20	4	0	0
Original Oil	97	3.5	93	7	50	15	5	0	0
New biomass	608	4.6	85	17	50	20	4.39	3,951	828
New oil	97	3.45	93	17	50	15	4.86	0	0

In both cases biomass fuel costs are assumed to be lower than oil costs i.e. there should be no need to award subsidy to switch based on fuel prices alone. It is the other factors which determine the size of the tariff subsidy required. Capex and O&M costs are much greater for biomass and a subsidy would be warranted to overcome these. Fuel costs were not amended between the original and updated tariff. (Values given in addendum included prices to 2 decimal places).

Boiler size, efficiency and load factor are also important determinants of the final tariff. The single tariff is based on a single point within a range for size efficiency and load factor.

The assumptions were used to model annual running costs. The difference between annual running costs under oil and biomass was calculated and is the basis of the subsidy. In the table below

biomass is calculated to cost £4,932 per annum more than oil and therefore a tariff of 5.9p/kWh is necessary to incentive people to invest in a biomass boiler (based on 17% running time).

	Annuitised capital cost @12%	Annual operating costs	Annual fuel costs	Annuitised upfront barrier cost	Ongoing barrier costs	Sum of difference	As subsidy (p/kWh)
New biomass	4,073	230	3,868	718	828		
New oil	710	173	3,902	0	0		
Difference	3,362	58	-34	718	828	4,932	5.9

The consultants stated that the updated tariff reflected inflation, technology costs, tariff bands / boiler size and the inclusion of barrier costs.

### 20 February 2012 addendum to State aid notification

The new state aid notification included the revised tariffs. The 'Intermediate' tariff was based on 50kW boiler as the reference size. The addendum stated that "The most significant changes in the tariffs have been a result of changes in proposed banding, primarily this relates to biomass boilers and GSHPs. The bands have been revised following concerns that the 0-45 and 45+ bands were too generic and, in particular, the 45+ band was too wide given the varying applications for renewable heat. These bands have therefore been revised to attempt to group more similar installation types.

### 1 March 2012 economist review

Having reviewed information pack for casework committee including latest CEPA appraisal and state aid addendum, the economist stated that "I'm content that this appraisal has been carried out in accordance with the NIGEAE guidance and that the approach adopted represents value for money and is the most effective way of allocating the resources provided by HMG for the purpose of a Northern Ireland RHI".

### 9 March 2012 Casework committee

Casework committee considered the RHI.

**Between March and April 2012** Business case to DFP produced by Energy division.

**21 March 2012** economist provided the following comments on the draft business case for DFP

"Can the monetary section be expanded/made clearer (perhaps include a description of how the tariffs have been calculated). It would also be useful to include commentary to explain the financial model and how this formed the basis for all the NPVs etc that have been derived (DFP may request to see spreadsheets associated with the NPV calculations). In addition, perhaps you could clarify what has been assumed in relation to admin costs for the NPV calculations".

**27 April 2012** DFP approval; extract from letter:

"Having considered the Business Case and the additional clarification provided on 26 April, I am content to convey DFP approval to this proposal. This approval is given on the basis that:

Whilst the scheme is envisaged to be open to new installations until 2020, approval is given for the period 1 July 2012 to 31 March 2015, representing the period for which HMT funding has been secured. Any decision to continue the scheme beyond 2015 would require further/separate DFP approval”

## **2. Andrew McCormick’s queries on DFP business case**

- A. Departmental Economists have also assessed the tariffs and assumptions behind the calculations and have deemed them appropriate. (Business case paragraph 10.4)

Under the updated tariff, the reference technology size has been increased from 20kW to 50kW and the load factor – or running hours - is assumed to be 17%. Under these assumptions the updated tariff of 5.9p would reward the investor with a 12% return and the tariff would be deemed appropriate.

Tariffs were examined by the economists and by the CC. Given the assumptions outlined above the tariff for biomass would allow a return of 12% on investment in a new biomass boiler. While the tariffs are appropriate under the assumptions outlined the CC was also reassured with the proviso that if any of the assumptions changed then the tariffs could be revised. A major change in the assumptions would be the running hours.

The CC was told on several occasions that “the RHI will have scheduled reviews built-in to the scheme to allow DETI to ensure that the scheme remains fit for purpose and value for money for the duration” ...”The RHI will be review in 2014 (and at regular intervals thereafter) and tariff levels may be adjusted, for new installations, if appropriate”

However, experience has shown that in reality these assumptions did not hold. In reality most boilers installed are 99kWh and most boilers operate for more than 17% of the time.

With hindsight and evidence of the different boiler size and different running hours it would have been appropriate to allow the tariff only up to the assumed load factor. Thereafter a lower tariff should have been applied.

- B. Tiering is not included in the NI scheme because in each instance the subsidy rate is lower than the incremental fuel cost. (Note 59 p 104)

For biomass below 100kW the updated subsidy rate is 5.9p/kWh. The incremental fuel cost for biomass is 4.39p. However other running costs are higher with a biomass boiler. I have calculated O&M to be 0.36p/kWh for a biomass boiler – based on the figures in the consultants’ report.

Therefore it costs the participant 4.75p to produce an additional kWh but the subsidy is 5.9p. Therefore the participant is incentivised to run the boiler earning 1.15p for every additional kWh produced.

This analysis ignores the capital cost of the boiler. However assuming the capital cost is paid for by running in the tariff by running the boiler up to a load factor of 17% then and output above this level only adds to the profitability of the scheme.

From this analysis it is clear that the subsidy rate is not lower than the incremental (operating) cost.

A tiered tariff above 17% would have been appropriate.

It appears anecdotally that the footnote 59 may have been copied from the earlier report without verification that it was now incorrect. As noted above this statement was also incorrect for small biomass in the original report.



**From:** [Wightman, Stuart](#)  
**To:** [McCormick, Andrew \(DFE\)](#); [Clydesdale, Alison](#)  
**Cc:** [Cousins, Heather](#); [Dukelow, Victor](#); [Smith, Alan](#); [Murphy, Shane](#); [Woods, Michael \(DFE\)](#); [McCann, Brendan](#); [Marten, Lucy](#)  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 26 September 2016 21:44:05  
**Attachments:** [image001.png](#)  
[image002.gif](#)

Andrew

I agree that the NI biomass tariff was not designed to cover fuel costs (as biomass pellets were cheaper than oil in 2012) but to cover the capex and barrier costs and provide a 12% rate of return over 20 years. However, as you have quite rightly highlighted, the tariff was still based on a 17% load (1,485 hours operation a year) so payments should surely have stopped each year once this load was reached. This should have been via a tier/cap at 1,485 hours over which the tariff drops to zero. Without such a tier, participants will receive additional profit/return once they exceed the 17% load.

Obviously oil prices have dropped significantly since 2012 and biomass is now over 1 p/kwh more expensive than oil. I'll see if we can populate the table below accordingly.

The footnote in the 2012 business case states that **'Tiering is not included in the NI scheme because in each instance the subsidy rate is lower than the incremental fuel cost'**. Emer's explanation may well make the highlighted text accurate however I can't see how this justifies not having tiering. A tier/ cap was always needed to prevent any further incentivisation after 1,485 hours.

The NIAO Report refers to the biomass fuel cost (not incremental fuel cost) of 4.39p/kwh being lower than the RHI tariff (5.9p/kwh) and that this creates an incentive for participants to excessively use their boilers to maximise subsidy. Without a tier/cap at 17%, surely NIAO's assertion is still correct i.e. participants will make 1.51p/kwh profit by continuing to run their boiler beyond 1,485 hours each year whether the heat is needed or not.

Happy to discuss.

Thanks, Stuart

### Stuart Wightman

Energy Efficiency  
 Department for the Economy  
 Netherleigh  
 Massey Avenue  
 Belfast, BT4 2JP  
 Tel: 028 9052 9425 (ext: 29425)  
 Mob: Personal information redacted by the RHI Inquiry  
 TextRelay: 18001 028 9052 9425  
 Web: [www.economy-ni.gov.uk](http://www.economy-ni.gov.uk)



[NI Year of Food & Drink 2016](#)

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

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**To:** Clydesdale, Alison  
**Cc:** Cousins, Heather; McMurray, Stephen; Wightman, Stuart; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DFE); McCann, Brendan; McFarlane, Iain; Coyne, Terence; Conliffe, David; McEvoy, Colette; Marten, Lucy  
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**Subject:** Fuel costs assumptions RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 26 September 2016 22:34:10

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Andrew

The additional analysis in 2012 by the consultants sets out the following .

1. Price of biomass fuel NI vs England

Wood chips (small commercial) NI 2.85p/kWh England 1.94p/kWh

Wood pellets (small commercial) NI 3.37 p/kWh England 4 p/kWh

2. The consultants set out fuel prices for both woodchip and wood pellets from 2010 – 2040 in increments of 5 years. The 2011 report considered H M L scenarios for all fuels but the conclusion in 2012 around biomass fuel prices was:

Commercial woodchips are set at 4p/kWh increasing to 5 p/kWh by 2020 and then staying at that rate until 2040.

Commercial wood pellets are set at 3 p/kWh for the entire period.

Oil prices were estimated to be 5 p/kWh rising to 6 p/kWh in 2030 – oil prices have infact fallen though.

Alison

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**Sent:** 26 September 2016 18:06  
**To:** Clydesdale, Alison  
**Cc:** Cousins, Heather; McMurray, Stephen; Wightman, Stuart; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DFE); McCann, Brendan; McFarlane, Iain; Coyne, Terence; Conliffe, David; McEvoy, Colette; Marten, Lucy  
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**Subject:** Re: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 27 September 2016 08:05:11

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Many thanks

Sent from my BlackBerry 10 smartphone.

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**From:** Dukelow, Victor  
**Sent:** Tuesday, 27 September 2016 07:30  
**To:** McCormick, Andrew (DFE); Clydesdale, Alison  
**Cc:** Smith, Alan; Wightman, Stuart; McCann, Brendan; Coyne, Terence; McMurray, Stephen; Conliffe, David; McEvoy, Colette; Marten, Lucy; Woods, Michael (DFE); McFarlane, Iain; Cousins, Heather; Murphy, Shane  
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Andrew,

I will seek to speak to Emer asap this morning however struggling to catch the logic. As others have said in response - it might hold up if the original assumptions re loading/fuel costs had held. However the incentives worked against that with loading in particular taking on a very different outcome.

Will update you after speaking with Emer.

Victor

Sent from my Android device managed by BlackBerry Enterprise Service

On 26 Sep 2016 9:44 p.m., "Clydesdale, Alison" <[Alison.Clydesdale@education-ni.gov.uk](mailto:Alison.Clydesdale@education-ni.gov.uk)> wrote:

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So in other words a mechanism to limit usage was always needed.

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Feel free to check with Emer that I have grasped this accurately.

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Many thanks.



**From:** [Woods, Michael \(DFE\)](#)  
**To:** [Wightman, Stuart](#); [McCormick, Andrew \(DFE\)](#); [Clydesdale, Alison](#)  
**Cc:** [Cousins, Heather](#); [Dukelow, Victor](#); [Smith, Alan](#); [Murphy, Shane](#); [McCann, Brendan](#); [Marten, Lucy](#)  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 27 September 2016 10:49:45  
**Attachments:** [image001.png](#)  
[image002.gif](#)

Andrew

While the footnote may be technically correct, the NIAO point is that with a incentive per KWH greater than the cost of fuel, someone running their boiler 24hr/day will make a profit greater than the intended rate of return. So while the initial rate was correct based on assumptions there was still an absence of a demand led control to prevent excessive or unnecessary heat in order to generate a return. If the assumption of usage had been correct then total costs / total return may have been correct (Alan is that the case) but the assumptions in the business case were subject to change and there was 1) no control to ensure behaviours were in line with assumptions and 2) no revision of tariffs in 2014 to see if other assumptions such as cost of fuel had changed.

### Michael Woods

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 Web: [www.economy-ni.gov.uk](http://www.economy-ni.gov.uk)



[NI Year of Food & Drink 2016](#)

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

**From:** Wightman, Stuart  
**Sent:** 26 September 2016 21:44  
**To:** McCormick, Andrew (DFE); Clydesdale, Alison  
**Cc:** Cousins, Heather; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DFE); McCann, Brendan; Marten, Lucy  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF

Andrew

I agree that the NI biomass tariff was not designed to cover fuel costs (as biomass pellets were cheaper than oil in 2012) but to cover the capex and barrier costs and provide a 12% rate of return over 20 years. However, as you have quite rightly highlighted, the tariff was still based on a 17% load (1,485 hours operation a year) so payments should surely have stopped each year once this load was reached. This should have been via a tier/cap at 1,485 hours over which the tariff drops to zero. Without such a tier, participants will receive additional profit/return once they exceed the 17% load.

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The NIAO Report refers to the biomass fuel cost (not incremental fuel cost) of 4.39p/kwh being lower than the RHI tariff (5.9p/kwh) and that this creates an incentive for participants to excessively use their boilers to maximise subsidy. Without a tier/cap at 17%, surely NIAO's assertion is still correct i.e. participants will make 1.51p/kwh profit by continuing to run their boiler beyond 1,485 hours each year whether the heat is needed or not.

Happy to discuss.

Thanks, Stuart

**Stuart Wightman**  
 Energy Efficiency  
 Department for the Economy

Netherleigh  
 Massey Avenue  
 Belfast, BT4 2JP  
 Tel: 028 9052 9425 (ext: 29425)  
 Mob Personal information redacted by the RHI Inquiry  
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**Sent:** 26 September 2016 18:06  
**To:** Clydesdale, Alison  
**Cc:** Cousins, Heather; McMurray, Stephen; Wightman, Stuart; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DFE); McCann, Brendan; McFarlane, Iain; Coyne, Terence; Conliffe, David; McEvoy, Colette; Marten, Lucy  
**Subject:** Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
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**From:** [McCormick, Andrew \(DFE\)](#)  
**To:** [Dukelow, Victor](#)  
**Cc:** [Smith, Alan](#); [Wightman, Stuart](#); [McCann, Brendan](#); [Coyne, Terence](#); [McMurray, Stephen](#); [Conliffe, David](#); [McEvoy, Colette](#); [Marten, Lucy](#); [Woods, Michael \(DFE\)](#); [McFarlane, Iain](#); [Cousins, Heather](#); [Murphy, Shane](#); [Clydesdale, Alison](#)  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 27 September 2016 11:58:02

---

Many thanks for the read out from your discussion with Michelle. I take their point that there is a weakness around the monitoring arrangements, but I think we can and should continue in the view that the decision not to have tiering was not based on appropriate understanding and appreciation of the implications of what the Consultants were saying.

The current draft of the briefing says: "This failed to recognise the need to cap/tier payments after 17% to avoid over compensation and ignored the fact that the tariff was higher than the cost of biomass fuel."

But where was the cross over point from appropriate to inappropriate incentive? Emer focussed heavily on the point that the proposed 5.9 tariff was all needed to cover capital and barrier costs over 20 years [on the assumptions in the business case...].

Is it possible to use the same assumptions as were being used in the 2012 Business Case and establish at what load factor (and all other things being equal) the capital and barrier costs would be paid off too early – I doubt if it's as low as 17.1% but it would be useful to know if the margin was large or small.

---

**From:** Dukelow, Victor  
**Sent:** 27 September 2016 07:30  
**To:** McCormick, Andrew (DFE); Clydesdale, Alison  
**Cc:** Smith, Alan; Wightman, Stuart; McCann, Brendan; Coyne, Terence; McMurray, Stephen; Conliffe, David; McEvoy, Colette; Marten, Lucy; Woods, Michael (DFE); McFarlane, Iain; Cousins, Heather; Murphy, Shane  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF

Andrew,

I will seek to speak to Emer asap this morning however struggling to catch the logic. As others have said in response - it might hold up if the original assumptions re loading/fuel costs had held. However the incentives worked against that with loading in particular taking on a very different outcome.

Will update you after speaking with Emer.

Victor

Sent from my Android device managed by BlackBerry Enterprise Service

On 26 Sep 2016 9:44 p.m., "Clydesdale, Alison" <[Alison.Clydesdale@education-ni.gov.uk](mailto:Alison.Clydesdale@education-ni.gov.uk)> wrote:

Andrew

I think we will need further economist advice on this, however Alan is on leave for the rest of this week.

I have attached his advice as of last week .

The business case does confirm that “This is the fuel cost in 2012. The model takes account of expected future fuel costs in determining tariffs”.

Perhaps I am oversimplifying it but is the purpose of tiering not to address over usage –at 17% usage the rate of return has been achieved at a subsidy level 5.9 p/kWh – but it costs 4.75p to produce an additional kWh so the over incentivisation stems from a profit of 1.15 p /kWh being available because of the inability to limit usage.

The only deterrent from overuse if a tiered tariff was not being used would be that the tariff would be less than the absolute fuel costs.

So in other words a mechanism to limit usage was always needed.

The additional piece of consultants advice of 2012 that determined the 5.9 might give us the assumptions about the future costs of fuel. I will take a look at that.

Perhaps Shane or Victor could advise further ?

Alison

---

**From:** McCormick, Andrew (DFE)  
**Sent:** 26 September 2016 18:06  
**To:** Clydesdale, Alison  
**Cc:** Cousins, Heather; McMurray, Stephen; Wightman, Stuart; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DfE); McCann, Brendan; McFarlane, Iain; Coyne, Terence; Conliffe, David; McEvoy, Colette; Marten, Lucy  
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morning.

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**From:** [Murphy, Shane](#)  
**To:** [Woods, Michael \(DFE\)](#); [Wightman, Stuart](#); [McCormick, Andrew \(DFE\)](#); [Clydesdale, Alison](#)  
**Cc:** [Cousins, Heather](#); [Dukelow, Victor](#); [Smith, Alan](#); [McCann, Brendan](#); [Marten, Lucy](#)  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 27 September 2016 13:57:55  
**Attachments:** [image001.png](#)  
[image002.gif](#)

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To all,

Just for clarity, Tiering at an incremental subsidy that was below the incremental cost may well have been an effective guard against unnecessary consumption or use, but on its own it was not necessarily a guard against over compensation that would inflate the Rate of Return beyond 12% where applicants had a demand for heat over and above the assumed 17% load factor. So you may want to be clear about what you mean when using the term over compensation.

Also the Tiering debate seems to revolve around a Load Factor of 17% and seems to imply that this was the “right” assumption. If the assumed load factor had, by chance, say been set at 34% and not 17% the set tariff would have been set at say 2.95p – which would have, by chance, also been an effective guard against unnecessary consumption but would not have been an effective guard against overcompensation for those with a heat demand in excess of 34% (of which I understand there were many such applications). While focus seems to be on Tiering the PAC could just as easily argue that if the load factor assumption had been closer to profile of the actual applications then some of the problems may not have arisen.

If I can get a hold of Alan’s spreadsheet I can probably do that Rate of Return Analysis requested by Andrew around divergence away from the 17% load factor (Stuart do you have it?). The RoR will be highly sensitive to the load factor because the Load Factor Upside +83% is much greater than the downside -17%.

Shane

**Shane Murphy**

Analytical Services

Department for the Economy

Adelaide House

39-49 Adelaide Street

Belfast, BT2 8FD

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[NI Year of Food & Drink 2016](#)

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

---

**From:** Woods, Michael (DFE)

**Sent:** 27 September 2016 10:50

**To:** Wightman, Stuart; McCormick, Andrew (DFE); Clydesdale, Alison

**Cc:** Cousins, Heather; Dukelow, Victor; Smith, Alan; Murphy, Shane; McCann, Brendan; Marten, Lucy

**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF

Andrew

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**Michael Woods**

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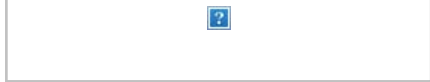
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**To:** McCormick, Andrew (DFE); Clydesdale, Alison  
**Cc:** Cousins, Heather; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DFE); McCann, Brendan; Marten, Lucy  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF

Andrew

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Happy to discuss.

Thanks, Stuart

**Stuart Wightman**

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**Cc:** [Smith, Alan](#); [Wightman, Stuart](#); [McCann, Brendan](#); [Coyne, Terence](#); [McMurray, Stephen](#); [Conliffe, David](#); [McEvoy, Colette](#); [Marten, Lucy](#); [Woods, Michael \(DFE\)](#); [McFarlane, Iain](#); [Cousins, Heather](#); [Clydesdale, Alison](#)  
**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF  
**Date:** 27 September 2016 16:40:45  
**Attachments:** [image001.png](#)  
[image002.gif](#)  
[EC1\\_16\\_0108753\\_RHI\\_IRR\\_summary\\_of\\_options.xlsx](#)

Andrew,

In relation to your Rate of Return question enclosed below is an extract from one of Alan's summary spreadsheets which shows an assessment of how the Rate of Return (IRR) varies with different load factor assumptions. As I mentioned earlier the Rate of Return varies very sharply with the load factor – and it very quickly diverges away from the target 12% IRR.

		Do Nothing Option	
No in sample	Running time	est. Subsidy	est. IRR
26	10%	5,246	4%
104	20%	10,492	18%
242	35%	18,361	41%
	(Average )48.7%	25,548	70%
315	50%	26,230	73%
568	75%	39,345	180%
127	95%	49,838	454%

## Shane Murphy

Analytical Services

Department for the Economy

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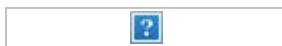
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**Please consider the environment - do you really need to print this e-mail?**

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**From:** McCormick, Andrew (DFE)

**Sent:** 27 September 2016 11:58

**To:** Dukelow, Victor

**Cc:** Smith, Alan; Wightman, Stuart; McCann, Brendan; Coyne, Terence; McMurray, Stephen; Conliffe, David; McEvoy, Colette; Marten, Lucy; Woods, Michael (DfE); McFarlane, Iain; Cousins, Heather; Murphy, Shane; Clydesdale, Alison

**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF

Many thanks for the read out from your discussion with Michelle. I take their point that there is a weakness around the monitoring arrangements, but I think we can and should continue in the view that the decision not to have tiering was not based on appropriate understanding and appreciation of the implications of what the Consultants were saying.

The current draft of the briefing says: "This failed to recognise the need to cap/tier payments after 17% to avoid over compensation and ignored the fact that the tariff was higher than the cost of biomass fuel."

But where was the cross over point from appropriate to inappropriate incentive? Emer focussed heavily on the point that the proposed 5.9 tariff was all needed to cover capital and barrier costs over 20 years [on the assumptions in the business case...].

Is it possible to use the same assumptions as were being used in the 2012 Business Case and establish at what load factor (and all other things being equal) the capital and barrier costs would be paid off too early – I doubt if it's as low as 17.1% but it would be useful to know if the margin was large or small.

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**From:** Dukelow, Victor

**Sent:** 27 September 2016 07:30

**To:** McCormick, Andrew (DFE); Clydesdale, Alison

**Cc:** Smith, Alan; Wightman, Stuart; McCann, Brendan; Coyne, Terence; McMurray, Stephen; Conliffe, David; McEvoy, Colette; Marten, Lucy; Woods, Michael (DfE); McFarlane, Iain; Cousins, Heather; Murphy, Shane

**Subject:** RE: Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF

Andrew,

I will seek to speak to Emer asap this morning however struggling to catch the logic. As others have said in response - it might hold up if the original assumptions re loading/fuel costs had held. However the incentives worked against that with loading in particular taking on a very different outcome.

Will update you after speaking with Emer.

Victor

Sent from my Android device managed by BlackBerry Enterprise Service

On 26 Sep 2016 9:44 p.m., "Clydesdale, Alison" <[Alison.Clydesdale@education-](mailto:Alison.Clydesdale@education-)

[ni.gov.uk](http://ni.gov.uk)> wrote:

Andrew

I think we will need further economist advice on this, however Alan is on leave for the rest of this week.

I have attached his advice as of last week .

The business case does confirm that “This is the fuel cost in 2012. The model takes account of expected future fuel costs in determining tariffs”.

Perhaps I am oversimplifying it but is the purpose of tiering not to address over usage –at 17% usage the rate of return has been achieved at a subsidy level 5.9 p/kWh – but it costs 4.75p to produce an additional kWh so the over incentivisation stems from a profit of 1.15 p /kWh being available because of the inability to limit usage.

The only deterrent from overuse if a tiered tariff was not being used would be that the tariff would be less than the absolute fuel costs.

So in other words a mechanism to limit usage was always needed.

The additional piece of consultants advice of 2012 that determined the 5.9 might give us the assumptions about the future costs of fuel. I will take a look at that.

Perhaps Shane or Victor could advise further ?

Alison

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**From:** McCormick, Andrew (DFE)

**Sent:** 26 September 2016 18:06

**To:** Clydesdale, Alison

**Cc:** Cousins, Heather; McMurray, Stephen; Wightman, Stuart; Dukelow, Victor; Smith, Alan; Murphy, Shane; Woods, Michael (DfE); McCann, Brendan; McFarlane, Iain; Coyne, Terence; Conliffe, David; McEvoy, Colette; Marten, Lucy

**Subject:** Immediate/Priority - RHI - Tariffs and Tiering - Query from DoF

**Importance:** High

Fundamental point from Emer Morelli re the Tiering/Tariff issue. I think Alan Smith may be the key person to address the substance of the point, but all of us will need to follow the reasoning.

Her logic is as follows:

- The decision to have tiering in England was driven by the need to incentivise the use of renewable fuels, because biomass was more expensive than gas – they had to have a subsidy rate **for fuel** that was greater than the incremental cost of fuel (ie the excess cost of biomass over gas)
- On the assumptions used in July 2011 and March 2012, the capital and barrier costs over twenty years needed the full level of subsidy - so paragraph 2.29 of the 2012 business case

- shows a need for 5.9 just to cover the annualised capital and barrier costs
- The “subsidy rate” in 6.7.1 in the July 2011 Appraisal and hence the footnote on p17 of the March 2012 Business Case refers not to the 5.9 overall tariff but to the **fuel cost element** of the subsidy – which, as shown in 2.29 of the Business Case was in fact -0.1. So this was truly in that sense **lower** than the incremental cost of fuel – ie we were not planning to subsidise fuel because biomass was cheaper than oil (as shown in the table in paragraph 2.28 – 4.39 vs 4.86). On that basis the footnote was and remains correct!!!
  - Hence the decision not to have tiering was okay - **on these assumptions** – because the full level of subsidy was required to cover the annualised costs of capital and barrier costs
  - However, **subsequent movements** in the prices of oil and biomass changed this balance and it was those market movements, not the absence of tiering that created the problem of overincentivising.

Feel free to check with Emer that I have grasped this accurately.

Pity such a fundamental question has arisen at this stage as it is a totally different argument from the approach taken in the NIAO Report which we agreed was factually accurate.

One key piece of information, which I think I need anyway, but which is also key to understanding this argument is some facts re fuel cost trends as below:

	Cost of Biomass p/kWh	Cost of Oil p/kWh
March 2012	4.39	4.86
November 2012 (or best date available close to the scheme going live)		
January 2014 (ie when we should have reviewed the scheme)		
March 2015 (when we began to realise we had a big problem)		
September 2016		
[Please add any other key stages that would be important]		

But I also need a view as to whether we accept Emer’s logic. Does the March 2012 Business Case establish that 5.9 is the tariff needed to incentivise the capex (given that we never needed to incentivise the fuel switch) **at whatever rate of usage applies??** Or was there then still a case for tiering, with an allowance for the capex in the form a higher tariff, followed, after a certain number of hours usage, by a drop to **no payment** (because the fuel cost would be lower than oil, and hence no need for subsidy at all (unlike GB which stepped down to 2p after 1314 kWhrs because gas was cheaper, and they had to incentivise the use of the more expensive fuel)).

**This needs urgent consideration as if we are going to change our line so fundamentally, and actually withdraw our agreement with the NIAO Report, we need to be very certain of our arguments.**

I am tied up first thing tomorrow, but should be available to get into this issue from mid-morning.

Many thanks.