

From: Jim Clarke  
Sent: 22 July 2015 12:19  
To: Sustainable Development Tenders  
Subject: FW: INC15, Project 1281

Paul

Recent email trail for INC15. FYI.

Jim.

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From: christopher boyle [mailto:info@cbengineeringconsultancy.co.uk]  
Sent: 22 July 2015 09:17  
To: Jim Clarke  
Subject: Re: INC15, Project 1281

Jim

Thanks for the e mail

4.5.4

The 371,250 figure comes from the anticipated heat load on the pellet boilers as broken down in the energy profile paragraph. I used the seasonal eff of pellet boilers then to get the fuel cost

Changes to NIRHI

The changes to the NIRHI are due in October as a result of the phase 2 consultation by DETNI. the understanding in the industry is that this will be implemented in October and the whole biomass sector is now preparing for these changes as it will effectively mean a reduction in the level of support as well as changing the structure. Apparently the main reason for this is an over exposure in agriculture, particularly poultry where there is high plant utilisation. The changes will also address the 100 kW cap and increase this to 200kw - all more in line with UK scheme. The changes will mean a reduction in support but will open up the scheme to many more sites such as hotels, nursing homes etc where 100 kW is simply too small and to hydraulically split installations is simply not feasible. Unfortunately the new tariff rates have not been published yet. This is the current word in the industry, but as you know the original rhi was subject to delays and essentially appeared under the radar when it finally was started. I wouldn't be surprised if something similar happens here

I hope this addresses your queries but give me a call as I'm in all day

Regards

Christopher Boyle

MSc BEng(hons) CEng MIEI

Christopher Boyle Consultants

36 Carrick Strand

Strabane

Co Tyrone

BT82 9RN

Tel 028 71882052

Mobile Personal information redacted by  
the RHI Inquiry

Web [www.cbengineeringconsultancy.co.uk](http://www.cbengineeringconsultancy.co.uk)

On 22 Jul 2015, at 08:15, Jim Clarke <[james.clarke@investni.com](mailto:james.clarke@investni.com)> wrote:

Thanks Chris.

## Section 4.5.4

One query. I cannot see where your revised figure of 371,250 kWh for imported pellet come from. Can you explain?

NIRHI

I know that that consultations are underway concerning the NIRHI but I wasn't aware it will change this October. I know that the solar PV ROCs will reduce from 4 to 3 on 1 October. Can you clarify?

Thanks.

Jim.

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From: christopher boyle [<mailto:info@cbengineeringconsultancy.co.uk>]  
Sent: 21 July 2015 19:15  
To: Jim Clarke  
Subject: RE: **INC15**, Project 1281

Jim

Thanks for the comments, I appears I can't add, but hopefully it'll make better sense now. The rate increase in NIRHI is accounted for in the report, shame it won't be for long with the October changes

I have made the necessary corrections which are attached in the revised report. These are in line with our commentary in red below, which hopefully address the queries

If you have any other queries, please come back to me

Revised report attached

Regards

Christopher Boyle MSc, BEng (hons), MIEI



36 Carrick Strand

Strabane

Co. Tyrone BT82 9RN

Tel: 028 71882052

Mobile Personal information  
redacted by the RHI Inquiry

Web: [www.cbengineeringconsultancy.co.uk](http://www.cbengineeringconsultancy.co.uk)



<image003.jpg>

 <http://www.enableireland.ie>

From: Jim Clarke [<mailto:james.clarke@investni.com>]  
Sent: 21 July 2015 17:05  
To: 'christopher boyle' <[info@cbengineeringconsultancy.co.uk](mailto:info@cbengineeringconsultancy.co.uk)>  
Subject: RE: INC15, Project 1281

Hi Chris

Thanks for getting back so quickly: happy with your answers to first set of queries.

I have some more questions:

Section 4.5.2

NIRHI. You quote £0.063/kWh The new rate is now £0.064/kWh for 20 kWth to 99 kWth

<http://www.nidirect.gov.uk/index/information-and-services/environment-and-greener-living/energy-wise/energy-saving-grants/renewable-heat-incentive-rhi/rhi-for-non-domestic-customers.htm>

Income from NIRHI @ £0.064 = 661,250 x 0.064 = £42,320 **corrected**

Section 4.5.3

4.2kg/kWh: this should be 4.2kWh/kg. **corrected**

For 90,000kg self generated fuel at 4.2kWh/kg, energy contribution = 90,000 x 4.2 = 378,000 kWh. You have 376,200 kWh. Any reason for the discrepancy? **Corrected, it appears I can't add**

Income from NIRHI @ £0.064 = 661,250 x 0.064 = £42,320 **corrected**

Section 4.5.4

Imported energy 781,013 kWh. Is this based on an average figure for seasonal efficiency between 87% (pellet) and 82% (log)? Using a figure of 84.6% gives 661,250/0.8467 = 781,000 kWh approx.

**For clarity, I added a breakdown of the load which then makes it easier to see what is at 87% and 82% eff. I also corrected the values in the analysis to take into account these changes**

For a 99 kW boiler supplying the Main Factory, where does the figure of 416,379 kWh come from? The assessed heat load for the Main Factory is 130 kW (Table 4.2.1). At a seasonal efficiency of 87%, the heat requirement is 130/0.87 = 149 kW. **See comment above**

For 2300 hours, the heat requirement is 149.4 x 2300 = 343,678 kWh.

Income from NIRHI @ £0.064 = 661,250 x 0.064 = £42,320 **corrected**

The calculations for lighting and solar PV make sense.

Looking forward to your reply.

Regards

Jim.

Received from Invest NI on 22/05/18  
Annotated by the RHI Inquiry

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From: christopher boyle [<mailto:info@cbengineeringconsultancy.co.uk>]  
Sent: 20 July 2015 22:26  
To: Jim Clarke  
Subject: RE: **INC15**, Project 1281

Jim

I hope you managed to get a few days off. Many thanks for your review, of which you raise some valid points which I have addressed. Please find attached the report with corrections based on your observations as well as some explanation as to where I got the figures from (below in red)

In addition, I added some information on the proposed changes to NIRHI which will impact on this installation

Let me know what you think

Regards

Christopher Boyle MSc, BEng (hons), MIEI



36 Carrick Strand  
Strabane  
Co. Tyrone BT82 9RN  
Tel: 028 71882052

Mobile: **Personal information redacted by the RHI Inquiry**

Web: [www.cbengineeringconsultancy.co.uk](http://www.cbengineeringconsultancy.co.uk)



<image003.jpg>

<http://www.enableireland.ie>

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From: Jim Clarke [<mailto:james.clarke@investni.com>]  
Sent: 20 July 2015 17:42  
To: 'christopher boyle' <[info@cbengineeringconsultancy.co.uk](mailto:info@cbengineeringconsultancy.co.uk)>  
Subject: **INC15**, Project 1281

Hi Chris

I called your mobile earlier and left a message. I have the following questions relating to Project 1281:

Section 4.2, Table 4.2.1

Boiler plant capacity is quoted at 289kW, yet  $99 + 60 + (60 \times 2) = 279\text{kW}$

**That is correct, however the maximum capacity of a log boiler is 60kW. I changed the table to**

a 60 & 80 kw units in the main factory & adjusted figures accordingly

### Section 4.3

In the Assumptions section, where does 285,979kg/pa come from? The annual site load of 664,700 kWh of delivered heat (based on 289kW x 2300 hours, which should be 279 x 2300 = 641,700 kWh) is based on a combination of one 99kW pellet boiler, one 60kW log boiler and 2 x 60 kW log boiler for each production area. In Table 4.3.1, for 99kW boiler, estimated annual consumption is 21.88 x 2300 = 50,324kg/annum. For a 60kW log boiler, consumption is 20.83 x 2300 = 47909kg/annum. For the two remaining 60kW log boilers, the consumption = 47909 x 2 = 95,818kg/annum. Therefore, the total annual consumption for the three production areas = 95,818 + 47909 + 50,324 = 194,051kg.

You spotted a bit of an error here. Firstly, it was fundamentally wrong as I based it on boiler capacity & not actual heat load. It should be based on 287.5 kW at 2300 hours full load equivalent which makes 661,250 kWh output energy. I have changed the summary to evaluate fuel consumption based on seasonal efficiency not nameplate and added a note to that effect.

I redid this section as you will see in the report and carried the new figures through

### Section 4.5, Table 4.5.1

For the assessed heat load for the PVC factory, you state 2 @ 45 kW each. Should this not be 2 @ 50 kW?

I agree and this has been changed

### Section 4.5.2

The imported energy figure of 760,057 kWh is based on 661250/0.87 = Where does the seasonal efficiency of 87% come from? The 661,250kWh is the heat required from the biomass boilers, so will this be supplied by a a combination of 99kW and 60kW boilers? You mention on four distinct plants each with a 99kW boiler, 99 x 4 x 2300 = 910,800kWh. At 94% efficiency, this is 910,000 x 0.94 = 855,400kWh which does not match 661,250. Can you clarify?

The 87% seasonal efficiency is sourced from CIBSE and verified by industry experience, I am happy with it as being realistic as the part load operation will not result in nameplate efficiency. I think it was confusing previously to state nameplate efficiency and use it. That has been changed.

Regards

Jim.

Jim Clarke  
Deputy Principal  
Sustainable Development  
Invest Northern Ireland, Bedford Square, Bedford Street. BT2 7ES.  
Direct T: +44 (0) 28 9069 8064 Mobile T: Personal information redacted by the RHI Inquiry  
Email: [james.clarke@investni.com](mailto:james.clarke@investni.com)  
[www.investni.com](http://www.investni.com) [www.nibusinessinfo.co.uk](http://www.nibusinessinfo.co.uk)

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