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Differences between the EPC heat-load and a Renewable Heat installer’s Heat loss Calculations

In my seven years of producing Energy Performance Certificates (EPCs) I have been contacted more than once by clients telling me that the heating costs on their EPC is too high and that the EPC will put off potential buyers or tenants. But recently I have been getting calls from clients telling me that my heat demand figures (on the last page of the EPC) are too low.

This seems odd to me, but I don’t think it is any coincidence that these clients are also people looking to install renewable heat technologies and claim the renewable heat incentive (RHI). The RHI is a payment from the Government to people using renewable heat technologies to help reduce CO2 produced by buildings in the UK. It is the first program of its kind in the world and it looks like it is becoming quite popular.

The value of this seven year annual payment is based on the heat demand stated on the EPC. So no wonder people want it to be higher you might say. But it was more than that. Renewable heat installers would call and say that the EPC must be wrong because their own heat loss calculations are so much higher than that on the EPC. Initially I would double check my own calculations, but found them to be correct. Talking with other assessors this seems to be happening more and more.

Now I don’t for one minute think that EPCs give an accurate estimate for heating costs - my previous experience of people calling me up and saying their bills are much lower prove that. The EPC for my own house says my gas consumption should be around 25% higher than it is. But the EPC is meant to give guidance based on perceived typical heating temperatures and heating periods so that all properties can have their energy efficiency compared.

Getting a bit fed-up with the calls I decided to see if I could find a reason for the big differences that were showing up - up to 40%. After some research I came up with the theory that the heating installers were assuming the properties are heated all the time and do not factor in that people use heating programmers, but this seemed wrong to me as the calculations are following CIBSE guidance and so I thought I must be missing something and have it wrong.

My colleague Neil Towler visited a renewable heat installer recently as he is to be trained up on how to do heat loss calculations for installers. We compared the inputs, and the heat loss calculation that an installer must do is quite comprehensive and I can see why they believed their way must be more accurate and the EPC or energy assessor at fault.

However, the reason for the difference between the heat demand figure (in KWh’s) displayed on an Energy Performance Certificate, and the KWh Heat loss calculation provided by a heating installer is that the heating installer must size a system based on a worst case heating scenario. This worst case scenario assumes that the property is heated to 18-22 degrees for 24 hours per day, 7 days per week.

The vast majority of people don’t heat their properties this much and so the Government won’t pay for people to do this under the Domestic RHI.

The EPC software has different heating time assumptions. These being that an ‘average property’ is heated to 18-21 degrees, 9 hours per day Monday to Friday (2 hours am and 7 hours pm) and then 16 hours per day at the weekend. That’s 77 hours per week and not 168 hours per week as in the MCS heat loss calculation. An MCS heat loss calculation also doesn’t factor in any heat gains not originating from the heating system – so it excludes: solar gains, cooking, lighting, electrical appliances and occupants.

It has been decided that it would be fairer to base the RHI payments on this EPC average heating pattern. This means that the money in the RHI pot can be spread across more installations and so more carbon can be saved.

So there are a number of reasons why we might want to produce an EPC or complete Heat loss calculations on a property and how we interpret the output will depend on why the calculation or EPC was requested. The EPC will provide us with a heat demand based on accepted averages which can be used for the RHI, but it won’t be of use to an installer in sizing a heating system. Whereas the Heat loss calculation will provide figures for basing the sizing of the heat pump or biomass boiler, but it almost certainly will suggest that the heat demand is higher than the EPC.

As we are all different and heat our homes differently, in reality neither will probably accurately reflect what the actual heating demand for the householder is per year, but perhaps we (or the householder!) should be thankful that in regard to RHI purposes the EPC itself historically tends to over-estimate heating demand. Householders can get a reasonable idea of what their actual consumption is by looking at 12 months’ worth of energy bills, something that forms part of the green deal assessment. The general experience of assessors at Severn Wye to date indicates that most people state they use their home in a way that would expect heating demand to be less than the typical amounts stated on their EPC.

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**National Green Deal Advisor of the Year 2014**

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