

## **RHI committee meeting**

**Wednesday 26<sup>th</sup> November**

### **Background:**

I'll start with the history as to "why" the model was developed. We, as in CASE wanted to see a resolution to the RHI scheme and as part of that were provided with a number of reports and correspondence.

What became clear was that there were several areas of disagreement with the department including the tariff rate and other factors which influenced expectations on returns including counterfactual fuels, fuel costs, efficiencies and other assumptions.

My conclusion was that in order to better understand these factors it would be useful to develop an independent model based on available data and use then it to support discussions.

As DfE representatives have pointed out at previous committee meetings the model that was developed can be described as a bottom-up model. In essence it estimates cash flows for the 99kW biomass boilers, as these had the most impact on the overall cost and were a focus of previous reports.

The cash flow analysis estimated the income received via the subsidy as well as outgoings for fuel costs, and operating costs. Some of these estimates were historic, others predictions of future cash flows. Alongside an estimate of the initial capital outlay these were used to determine the internal rate of return over the 20-year asset lifetime.

### **Model development:**

There are two values which impact the subsidy income, namely the tariff rate and the load factor – the load factor effectively being the average percentage of time the boiler is used at its maximum output. It therefore directly translates to the kWh or heat generated when you have the number of hours in a year and the capacity of the technology.

The combination of the tariff per kWh and the total kWh of heat produced in a year determine the payment and must be considered together when evaluating the overall cost of the scheme. The original RHI overspend issues arose when that connection was broken.

The outgoing costs relate to the fuel type, efficiencies, maintenance, hassle costs etc and it is in these costs where most of the complexities arise given the range of values that exist. For example;

Counterfactual fuel cost differentials including, biomass vs kerosene, LPG, natural gas etc.

What are the actual hassle costs?

Should ancillary equipment be included?

How much is annual maintenance for a given technology?

Are financing costs eligible?

Some of these have been highly variable over the last decade, most notably fuel costs and this has had a significant impact on decisions relating to point of time tariff setting.

For example, if favourable conditions are assumed regarding biomass pricing, then tariffs can be set quite low, only for fuel costs to rise sharply in response to factors such as the Ukraine/Russia war pivoting the scheme to an unfavourable position.

Some of the key decisions and assumptions used to develop the model are that,

- LPG was the counterfactual fuel and the differential cost of the heat delivered used to give either a net benefit or deficit. For example, if LPG is more expensive than biomass then there is a net benefit to using biomass vs the counterfactual. If LPG is cheaper than biomass there is a net deficit to the participant.
- Capital equipment costs were estimated from reports including core ancillaries.
- Hassel and maintenance costs were taken together and estimated as a percentage of the original capital expenditure (5%).
- Financing costs were considered but not included in the main tariff calculation.
- RPI values were used to predict out how the costs and tariff will change and estimated out to 2035 assuming that index rises would be similar to those before the 2022/23 jump.
- To simplify the calculation only a tier 1 tariff was used alongside a cap of 15% which is the tier 1 cap, similar to current state. The reason was that I had no data on the actual usage figures post the 2017. Prior to that the payments to boilers was in the public domain and that data was used to give an estimate of load factor between the accreditation date and the end of February 2017.
- Boilers which had a historic (pre 2017) load factor greater than 15% were then capped at 15% post 2017 for their remaining lifetime, boilers with a load factor less than 15% retained their original value.
- The calculations were performed for 1262 boilers on the list and the average rate of return calculated given a set tariff starting in 2025 and increasing with RPI.

**Result:**

The key result is that when the tariff is set at 7p/kWh then the average internal rate of return for the 1262 boilers in the list was 11.9%, just below the 12% state aid maximum.

That does not mean that everyone gets the 11.9%, it is the average value. The total estimated cost of the closure scheme for the 99kW boilers between 2025-2035 was around £126m.

### **Key differences**

There are a number of differences between the DfE model and my model but overall they broadly agree. Differences include

DfE could draw from the historic OFGEM dataset on load factors which firstly leads to the closure model proposal to use the 2017-19 data which I think is fair. And secondly allows for future payments to use both a tier 1 and tier 2 tariff rate for the 99kW boilers.

This means that the DfE model is around 12% more, at £141m for the 99kW systems, than my model which is explained by the larger estimated heat output and use of kerosene as the counterfactual. Basically, the DfE tier 1/tier 2 tariffs of 6.1p and 1.7p with a 15% tier 1 cap is on average more beneficial to participants than my 7p/0p model. On the whole I think it is fair and reasonable based on the data. Participants and bodies like UFU and RHANI will have greater knowledge of the historic factors and are better positioned to advise.

### **Banding:**

I know the committee are concerned about banding and while this was not part of the original model I have also looked at it.

Banding has advantages and disadvantages, advantages include a streamlined process for DfE and participants, lower operational costs, increased flexibility to operate and allows for better financial planning etc but this needs to be weighed up against the disadvantage of what would be considered an overpayment relative to metering for the heat produced.

Things to keep in mind are that if you are of the view that participants are entitled to a fair return on their investment in line with the 12% then the model shows that the 99kW boilers should continue to receive close to the maximum payment irrespective of the amount of heat produced. This comes about from the relative insensitivity of the IRR to the fuel price differentials over the last 10 years of the scheme assuming no new energy crisis.

If you are of the view that participants only receive income on the heat produced and only able to achieve the expected return if operating at the maximum of their historic heat output then you would tend towards metering.

The banding payments are essentially a blend of these two views. It aims to encourage people to use the boiler to its maximum historic load while protecting income even if

there is some variability in output and allows boilers to remain on the scheme for future use.

You can model out what the potential impact may be and if you assume that all participants decide to maximise their income and minimise heat then the cost differential between banding and metering would be close to 50% of the total payment which is significant.

If however only a small number purposefully or are required to operate this way for a period then the saving to the taxpayer significantly reduces and can be outweighed by the increased costs to operate the scheme and assure meters are compliant. Basically this means that there is a cut-off where it is neither in the taxpayer or participants interests to move to metering vs banding. I have not estimated where that cut-off is as it will depend on costs including new meters, additional monitoring and systems, legal fees etc.

What I will say is that given the conversations that I have had with different stakeholders the drivers are towards heat maximisation and at this stage there is little evidence to suggest that metering is required.

What I will also say is that RHANI, UFU and others are clear that they want controls that are fair, transparent and assure the integrity of scheme going forward.

## **Finish**

I have through DfE provided an additional briefing document as well as the Excel model and I'm happy to talk through that if you need any clarity.

Notes:

***The internal rate of return (IRR)** is the discount rate that makes an investment's net present value (NPV) of cash flows equal to zero, NPV measures the value of an asset that has cashflow by adding up the present value of all the future cash flows that asset will generate.*