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Summary of Consultation Responses:

Published: 17 October 2014

Responses received to the Ofgem consultation on heat meter eligibility in the Non-Domestic RHI scheme: heat meters with strap-on temperature sensors

Consultation opened: 14 July 2014
Consultation closed: 14 August 2014

For further details on the consultation, and to view Ofgem's decision document including a summary of responses, please visit our website.

Responses:

Response	Respondent
1	I APPLEBY FROM CREATIVE ENVIRONMENTAL
2	JONATHAN SWAIN FROM FARM ENERGY CENTRE
3	GEORGE FLETCHER B.Sc. FROM GF CONSULTING
4	NICK MONETHER FROM GREENFIELDS CONSULTING
5	STEPHEN OAKMAN FROM KAMSTRUP INSTRUMENTATION LTD.
6	DEREK PYE FROM METERS UK LTD
7	JOEL DUNNING, A CUSTOMER
8	PAUL JONES FROM WESTOVER FARM

Verbatim stakeholder responses

The following are the stakeholder responses we received to the consultation which ran in July and August 2014. The responses are grouped into:

A. Consultancies
B. Manufacturers
C. Business consumers

All responses were received by email except Derek Pye of Meters UK Ltd and Paul Jones of Westover Farms who submitted PDF documents. The wording is included here verbatim.

A. CONSULTANCIES/INSTALLERS

RESPONSE 1.

I APPLEBY FROM CREATIVE ENVIRONMENTAL:

- We have been providing metering inspections from the commencement of the 'Non Domestic RHI'.
- In broad terms 9 out of 10 metering installations fail due to non-compliment Installation standards.
- The conclusion therefore, is that installers continue to fail to provide metering that records heat use accurately.

- ALL metering installations therefore should be inspected by an unbiased third party, regardless of how many meters are installed or where they are located.
- On evidence all metering requires inspection by a qualified 'Independent metering inspector'.
- The introduction of 'clamp on' type metering will allow metering installations to be installed by less qualified personnel.
- Presently, metering installation typically falls to the pipe fitter who will generally have a reasonable level of understanding with regard to fluid flow and hydraulic best practice. (A mechanical or plumbing qualification).
- The introduction of 'clamp on' arrangements allows metering installation by potentially non skilled personnel, further increasing the risk of non-compliment installation.

In conclusion

We see a widespread problem with metering installations due to a general lack of control, not necessarily due to a lack of understanding of installation requirements, but in main, due to the pressure of contracting (e.g. completion within programme) that give rise to installation errors. We feel introducing 'clamp on' type metering will only exacerbate the problem due to the ability to install meters by non-skilled operatives and we also feel that installation contractors should not be able to self-certify their own installations.

RESPONSE 2.

JONATHAN SWAIN, SENIOR ENGINEER FOR FARM ENERGY CENTRE:

We at Farm Energy Centre welcome this consultation as it starts to officially address an issue that is both contentious and confusing to applicants, installers and IRMA authors alike. It is true that there are few manufacturers who supply such sensors but it is an issue we are fielding enquiries about on a very regular basis.

For the avoidance of doubt, some in the industry refer to strap on sensors as non- invasive sensors. It is important to emphasise that the commonly used alternative (a pocketed sensor) is also a non-invasive item too as the sensor is not in direct contact with the medium requiring measurement.

There are two issues we believe important; security and accuracy.

Security

In order for OFGEM to be sure that the meter provides measurement of the actual heat delivered/used we need to be certain that the metering installation has not altered from that seen on IRMA visit or audit. Strap on sensors present several challenges with regards to ensuring that a user/anyone with malicious intent does not simply remove a sensor with the intent of falsifying the quantity of heat recorded.

Protection against tampering is easier to achieve with pocketed sensors as the lock screw can be tightened and a wire tie seal installed to protect against accidental removal, and also evidence if the sensor been tampered with at audit or similar. The method of security with strap on sensors is limited to a security seal sticker which has 4 issues:

- The stickers are not supplied as a matter of course with the metering package
- Where stickers have been supplied they are not always fitted and it appears that this is no barrier to accreditation
- Should the integrity of the sensor installation be compromised the sticker could loosen and fall off through no fault of the authorised signatory
- Replacement stickers are easily obtainable should malicious intent be realised.

Accuracy

We believe that a well installed strap on sensor can display accuracy under test conditions as good and maybe even better than a pocketed sensor. However, it is unfortunate that almost all installations we see with strap on sensors have them poorly installed. The failure to adhere to installation instructions and the ease with which this can happen is our biggest accuracy concern.

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The commonest issues we see are:

- Poor adherence of the sensor to the pipe – I have seen sensors that are hanging from the strap with an air gap in evidence between sensor and pipe
- Sensors on top of pipes - if there is any air trapped in the pipe then these will not record the temperature of fluid in the pipe
- Sensors not insulated and hence being impacted by ambient conditions

A secondary issue with regards accuracy is the speed of response of the sensors to changing fluid temperatures within the pipe. Whilst steel is a good conductor of heat should the conditions be very transient a strap on sensor is inherently going to give less accurate results. The drop in accuracy however will be small and is more than likely within the acceptable range.

Both of the areas discussed above can be resolved by aligning metering to a specified accuracy and security standard. Whatever standard is decided upon we believe it should:

1. Provide evidence of manufacturer independent accuracy testing by a competent authority
2. Clearly demonstrate the test results and their comparison to the desired accuracy
3. Clearly outline the installation methods under which the desired accuracy can be achieved in real world installation
4. State the service/calibration intervals
5. State any exceptions that may apply
6. Be clearly written for the avoidance of doubt
7. Be equally applicable to all designs of metering

RESPONSE 3.

GEORGE FLETCHER B.Sc. FROM GF CONSULTING:

- We have only carried out some basic tests and that was some years ago. We wanted to find out how representative external sensors were to immersion sensors.
- What we found was that without insulation the reading from the external sensors was very low and was lower on hotter pipes than cooler pipes.
- With well insulated pipes and sensors the readings were lower with the external sensors but the difference between flow and return pipes was the same from immersion and external sensors.
- The accuracy of our measurements was not good as the instruments only indicated 0.1'C and we did not have constant flow and return conditions.
- My personal feeling is that immersion sensors only should be used because of the reliance on good fitting and insulation with external sensors. We do not consider that all installers are capable of fitting external sensors so that they read accurate differential temperatures.

RESPONSE 4.

NICK MONETHER , GREENFIELDS CONSULTING:

Thank you for the opportunity to provide a response to Ofgem's consultation on 'heat meter eligibility for the non-domestic RHI' with specific reference to 'strap-on' temperature sensors.

Pre-amble:

- The measurement (accurate or otherwise) of 'heat delivered' has been massively over-looked in the UK to-date.
- We have to assume this has been because of the relatively low-cost (value?) of this essential but taken for granted 'product', heat.

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- The huge increase in awareness, learning and competition in the demand, installation and supply of heat metering equipment, that has undoubtedly only happened because of Ofgem and the RHI, must not be squandered.

Current MID requirement for temp. sensors:

- The current requirements for Class 2 meters demand that a temperature sensor 'reports' an accurate measurement of the temperature of the fluid within which it is immersed or, as reasonably possible, without direct immersion.
- To achieve this the default design requires the sensor to be within the centre of the flow it is detecting. This is the ideal for a temperature probe (TP).
- For a TP attached to the outside of a pipe and still achieve the accuracy of the same probe immersed will require a significant logical calculation but is not impossible.
- If the software and 'open-source' calculations for such allowances are made available to Ofgem and publicly, I can see no reason why these types of TP should be excluded from RHI acceptance.
- But I would expect a full range of installation condition options to be available in the software freely shipped with the product.
- I would also expect the EU Legislators to take exception to the UK 'accepting' such devices under MID without full EU legal consideration.

UK consistency:

- I believe the only UK comparator regarding the requirements of the performance of heat meters in relation to fiscal support is the CHPQA Scheme.
- I may be wrong but https://www.chpqa.com/guidance_notes/GUIDANCE_NOTE_16.pdf suggests a Class 3 heat meter is acceptable for fiscal support under CHPQA.
- In my response to your consultation I would suggest there should be absolute consistency in requirements for RHI with other UK fiscal support, including CHPQA.
- I have not checked the legal/fiscal requirements attached to those providing and selling heat under DH/ESCo etc; business models.

In summary:

- There is no reason strap-on sensors should not be accepted for RHI metering calculations as long as the results of their measurements are proven beyond reasonable doubt (i.e. within the MID requirements).
- The HM accuracy requirements for RHI and CHPQA compliance should be aligned.
- Those offering heat supply, free boiler, etc; offers are brought under the same examination under the Consumer Protection Act.

B. MANUFACTURERS

RESPONSE 5.

STEPHEN OAKMAN FROM KAMSTRUP INTRUMENTATION LTD. SAYS:

For background:
Kamstrup have taken part in the IAG for the Non Domestic RHI (with Jacqueline Balian) and the metering stakeholder group for Domestic RHI (with Keith Horgan). We take a keen interest in heat metering.

I have various concerns about strap on temp sensors, as follow:

- They are not **MID** approved, the requirement which goes hand in hand with fiscal meters.
- Resultant Class of Heat Energy measurement will be?
- Non **EN1434** compliant
- Do not fit with best practice as in **CEN-CR 13582-1999**

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- They will not intersect the middle of the flow in the pipe and will therefore not measure the actual temperature of the flow (There is a temperature gradient across the pipe)
- Varying pipe insulation will cause varying outcome of temp measurement
- Position of sensors is variable and not defined accurately enough as to be repeatable
- Pipe material / thickness will affect measurement
- Response time of temp measurement may lag, giving erroneous measurement of energy in relation to time.

This list is by no means exhaustive, but I trust it gives you some idea of my concerns.

RESPONSE 6.

DEREK PYE FROM METERS UK LTD:

Report To Ofgem On Temperature Sensors Thermal Measurement Heat Meters For Commercial RHI Scheme Public Consultation August 2014

Background
Meters uk Ltd are the only UK manufacturer of Heat Meters, the company Heat Meter products. Are the only known Digital Heat Meters manufacturers in the world. All other Heat Meter Instruments, use an old method of sensing and recording heat – Known as Platinum Resistor Sensors. (We refer to these as Analog sensors)

Why use digital technology?
The answer is simple, digital technology is highly accurate and very reliable. It just using the opportunities todays modern technology offers.

Why Strap the sensors onto the pipework, when traditionally the temperature sensors of Heat Meters have always been inserted into Interfaces known as Immersion Pockets?
Simple – digital devices are more efficient our Temperature Sensors take readings every second, this is 30 times more active than Analog devices. This non stop reading ensures that changes in temperature are monitored constantly.

Strap On sensors are only recommend for installations – with smaller pipe sizes and copper pipe

What's the down side of Immersion Pockets?
Smaller pipe sizes are more difficult to locate into interfaces often, in tight spaces – it can be the equivalent, trying to garden in a window box with a JCB?

Is there any difference in measurement?
Our experience and knowledge as a manufacturer who test temperature sensors, every day of the working week, is different from persons commentating from a desk. We as a company have designed and manufactured every piece of a Heat Meter We know and can prove it, in simple maths that the most important factor in the installation of Heat Meters, is even temperature collection, from the temperature sensors.

Example If the temperature sensors were reading for example 0.5 degree out from that actual heat liquid centre, on both sensors. This is far less critical in measurement total , than one sensor being 100% in its reading and the second being 1 degree out.

Are the strap on sensors – reducing measurement?
Strap on method uses a single brass probe onto the copper pipe (must be covered with 25mm of insulation) – whereas Immersion Pockets are Brass or Stainless Steel and twice the thickness of the copper pipe.

Copper is 4 times more thermally efficient than Brass and 25 times more efficient than Stainless Steel.

Our experience is that Strap On sensors are slightly more efficient than using Immersion Pockets But much more Installer friendly and definitely more likely to be reading correct measurement, in recommended installation

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criteria than Immersion Pockets, due to the much higher difficulty of Immersion pocket installation in a small pipe sizes.

Measurement Accuracy

- We can confirm and have the documented evidence to prove that Digital Measurement is Superior to Analog Measurement
- The EN 1434 Heat Meter Standards list Maximum Permissible Errors
- Example 50c Flow – 40c Return
- Analog device can have errors of 3.5 degrees and still be with measurement parameters
- Our Digital device in the exact same has a proven 'Band Gap' of 0.2 degrees
- The regulations allow a Analog Heat Meter to have errors in operation of 12% and still be within the Maximum Permissible Errors .. our temperature sensors will never stray beyond 0.2% . Digital sensors are fixed the never drift, they either work within the tight measurement parameters, or don't work at all.
- All these facts are proven science

RHI /MID Standard- Requirement.
Does NOT state any requirements regarding installation none what so ever

The Heat Meat Standard EN1434 states very clearly in BLACK AND WHITE

- EN1434 -1 – par 3.53
- Temperature sensor pair – for mounting with or without pockets.

Black and White it cannot be deigned

Testing Of Temperature Sensors

- It has been requested that our digital sensors be tested, Ofgem have clearly stated they were in instruct independent tests, after a period of over 6 months they confirm in writing that no test has taken place and no test is scheduled
- The National Measurement Office have can confirmed verbally that no test procedure is in place, to test digital sensors, all the relative standards EN 1434 etc. etc. have procedures for Analog devices only.
- As manufacturers we know that digital temperature sensors do not drift ever, any test would give the same result time after time. Reliability test data has been given.
- The Measurement Instrument Directive clearly states (section 9)

LEGISLATION SHOULD NOT IMPEDE TECHNICAL PROGRESS

- Calculator & Temperature Sensors
- These are referred to often as sub-assemblies.
- In the Heat Meter Standard EN1434 it clearly states that if other types of temperature sensors are used other than Analog devices

They are permissible but shall be part of the calculator

We confirm that out HCM4 is not made up of two sub-assemblies ie Heat Calculator and Temperature Sensors but is an integrated device, a single sub assembly as neither part will work independently

It should be also noted
A – That never at any time have Ofgem asked directly about testing of sensors and why we recommend in certain cases that they can be strapped onto the pipework. We would always assist with any reasonable technical enquiry from any source.
B – Meters UK have been refused twice requests under the Freedom Of information Act. ???
C – The National Measurement Office issued a statement to Ofgem , on the 15th July 2014 without referral to us as their client prior to dispatch which was factually incorrect, as the EN1434 standards had not been taken into account, which includes 'for mounting with or without pockets ' 'permissible as part of the calculator' AND

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Legislation should not impede technical progress meters uk Ltd were only aware of this error on 12th August 2014.

The National Measurement Office stated prior to dispatch of this document, said I've sent it to my boss, who is busy and I am going on holiday?
D – MID is not law in the UK
E – We note also that there are many inconsistences, and reserve the right to take any appropriate legal action

C. APPLICANTS

RESPONSE 7.

JOEL DUNNING:

I am a customer who has had his application held up due to this new issue coming to light, when many previous customers have had their applications accepted with the same meter and are currently using their meters to get their grant.

I do not really understand how you are holding up grant applications with this new issue, rather than instead stating a date at which the concern was widely publicised and then holding up applications whereby a meter was fitted after this issue was known about.

I think that you should process all current applications that are being held up by this new problem and issue a notification of the date at which you should warn people that fitting such a meter will potentially delay their application.

If this was a new law then it would only affect people who committed the offence when the new law was known about, so why not the same here?

I suggest that when any new modification to the RHI process is proposed that all applications are assessed by the rules that governed the installation when the installation was fitted.

RESPONSE 8.

PAUL JONES, WESTOVER FARM:

Please accept this submission for your consultation and I am more than happy for it to be open to public scrutiny.

As the subject of the consultation is having a terrible effect on £Millions worth of SME and charity investments, putting British Jobs at risk and damaging UK manufacturing, I have cc'd a number of parties into this document as they have already expressed considerable interest and it raises some major Political and legal issues, so I trust they will all take the time to read it.

Report to Ofgem on Strap on Temperature Sensors for the Commercial RHI Scheme
Public Consultation August 2014

1. Executive summary.

1.1 The result of this consultation will impact on over £10M of investments, British jobs, and the credibility of the biomass industry, The Department of Energy and Climate Change, Ofgem and the RHI scheme.

1.2 To date Ofgem have acted inconsistently and unequally in their approach to applicants with strap on sensors and without transparency.

1.3 Ofgem have acted slowly as they first had *"concerns"* in September 2013, this has allowed installations to continue and refused applications to snowball.

1.4 Ofgem's actions, in signing off applications with strap on sensors as recently as May 2014 have, in the eyes of many installers and consumers, established that such sensors are acceptable to the scheme.

1.5 Ofgem are using a standard for heat meters that has no legal basis in the UK and is therefore open to legal challenge.

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1.6 Ofgem have used a *"we are only following orders"* defence when asked why they use an EC Directive with no legal basis in the UK. They have deliberately not given a straight answer and appear to bury their heads in the sand (Appendix 3)

1.7 Ofgem will not entertain the use of the Weights and Measures Act even though it is sets the standard in UK law for heat meters and there sub-assemblies. (Appendix 3)

1.8 Using the EC Measuring Instruments Directive (EC MID) is both politically volatile and legally unsound.

1.9 No practical, political or legal reason for the use of the EC MID instead of the Weights and Measures Act has been offered by Ofgem.

1.10 The DECC it would seem are responsible for the decision to use EC MID.

1.11 Having been instructed to use the EC MID as a standard Ofgem, have failed to follow it.

1.12 Ofgem's guidance and The EC MID, when followed correctly, allow for strap on temperature sensors to be accepted onto the RHI scheme with manufacturers certificates of conformity and without the need for testing by a *"notified body"*

1.13 Ofgem have not followed their own guidance.

1.14 Analogue and Digital meters will have slightly different certification for the EC MID. The EN1434 test criteria (see appendix 2) shows that Analogue meters needs 3 certificated parts, heat calculator, flow meter and temperature sensors, whilst digital meters need 2 certificated parts, one for the heat calculator WITH integral temperature sensors and one for the Heat calculator.

1.15 Meters UK's HCM4 digital meter with integral strap on temperature sensors has been tested to Class 1 of the EC MID by the National measurements Office. Ofgem on many applications are inexplicably refusing to accept this certificate.

1.16 Ofgem's decision to retrospectively impose its September 2013 guidance change is legally unsound and grossly unfair.

1.17 Ofgem has sent letters and emails to applicants and manufacturers that are misleading and inaccurate.

1.18 To be fair and equitable, applicants who applied for the scheme before the publication of the result of this consultation (historical applicants), should be accepted onto the scheme so long as their installation has identical strap on sensors, both in manufacture and installation, to any of those already accepted onto the scheme in other installations. Payments should be backdated to the time of application.

1.19 Ofgem's concern appears to be that strap on sensors may result in applicants under- claiming for the scheme. As such there is no financial risk to the public purse by accepting historical applicants onto the scheme.

1.20 For future applicants Ofgem should clarify what heat meter standard they can legally set and ensure that applicant's temperature sensors meet that requirement.

1.21 Unless scientific evidence is produced to counter current testing and manufacturing procedures carried out by ISO 9001 manufacturers of strap on sensors, strap on sensors, should be accepted as accurate and allowed onto the scheme.

1.22 Ofgem staff should be trained so that they interpret any guidance and legal requirements correctly and consistently with all applicants treated equitably.

2. My interest as a stakeholder

2.1 In April 2013 I had a Biomass installation with the Meters UK HCM4 digital meter with the strap on temperature sensors fitted.

2.2 In May 2013, after commissioning I applied for the Non Domestic RHI.

2.3 Over 14 months later my installation has not been accepted onto the scheme.

2.4 I have been asked to prove that the temperature sensors meet the EC Measurement Instrument directive.

2.5 I was not asked about my sensors until November 28 2013, 6 months after application.

2.6 I have supplied Certificates of Conformity by the ISO9001 manufacturer for the installations temperature sensors.

2.7 After supplying certificates I was asked to supply details of how the sensors were installed.

2.8 In March 2014, 10 months after application, I was asked to send photographic evidence of how the sensors were installed.

2.9 The Ofgem email of 18th March states that they needed the evidence *"due to an issue we have recently been made aware of regarding Heat Meters UK temperature probes"*.

2.10 On 23rd April 2014 I received an email stating;
"Recent review of your application showed that you have strap on temperature sensors on your installed meters. An amendment to the RHI Regulations in September 2013 requires that all heat meters installed

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must be positioned to provide accurate measurement. We are currently working with our technical team to establish whether meters with strap on temperature sensors meet this requirement."

2.11 My application, purchase and installation and of the strap on temperature sensors predates September 2013.

2.12 Ofgem are applying the change to guidance retrospectively.

2.13 It is unlikely that this is legal.

2.14 Neither I nor my installers could have predicted this change.

2.15 It is unusual and arguably grossly unfair for standards and guidance to be changed and then imposed retrospectively.

2.16 I have provided a Certificate of Conformity from the manufacturer of the strap on sensors in January 2014.

2.17 The National measurements office have stated that such certificate is "always accepted for the MID"

2.18 The identical certificate has been accepted on other installations as recently as May 2014.

2.19 I have disputed the legality of the EC MID as a standard for heat meters in the UK.

2.20 I have asked that the sensors be proven to meet the standards set down in UK law, The Weights and Measures Act. I have received no answer.

2.21 An FOI request has been refused on the basis that it would take up too much time. That has limited my ability to submit all the information available to this public consultation.

2.22 I still await responses to many questions and my installation is still not on the scheme.

3. The EC MID as the Standard.

3.1 After a public consultation the UK government chose *"not to subscribe"* to the EC MID in relation to heat meters, this includes their sub-assemblies. Conformity to The Weights and Measures Act is the legal standard for heat meters in the UK.

3.2 In September 2010 Gastrec at CRE wrote a report to the DECC on *"Heat metering for the RHI."* (Annex 2)

3.3 The report recommends using the EC Measuring Instrument Directive to set the standard for heat meters for the RHI scheme.

3.4 The report states *"If DECC were to require operators to go beyond these functional requirements and/or existing UK fiscal quality products, there would be a strong risk of a legal challenge, as there is no evidence base to require other standards"*

3.5 The report fails to mention that the EC MID has no legal status for heat meters in the UK.

3.6 The use of the EC MID is outside of UK law and therefore, according to Gastrec at CRE's report to the DECC carries *"a strong risk of a legal challenge, as there is no evidence base to require other standards"*

3.7 In political terms ignoring a public consultation followed by a UK Government decision to effectively "opt out" of the EC MID for heat meters could be very damaging for the Ministers concerned.

3.8 "Imposing" rejected EC directives may not be welcomed by the UK public or press.

3.9 It is not clear why the DECC rejected UK law (The Weight and Measures Act), as the heat meter standard for RHI.

3.10 It is not clear why, of all the different heat meter standards in the world that could have been used, the standard chosen for the RHI was the one standard that the UK Government had "opted out of" after public consultation.

3.11 Ofgem clearly place the blame for this decision with the DECC. (see appendix 3)

3.12 Ofgem are deliberately evasive in their answers regarding the legality of the EC MID's use.

3.13 Whilst Ofgem have been notified by several parties that they believe the use of the EC MID is beyond UK law and Ofgems remit.

3.14 The responses given by Edmund Ward (Appendix 3) give no indication of concern that Ofgem may be acting beyond UK law. It offers no comfort that Ofgem are looking into it. The answers offer more of a head in the sand, blame the DECC approach.

4. Ofgem's procedural competence.

4.1 Ofgem have passed installations with strap on sensors whilst refusing identical installations, proving to be massively inconsistent.

4.2 Despite many applicants being told in the first few months of 2014 that strap on temperature sensors were under review and that the applicant must prove that their sensors comply with the EC MID, systems with strap on sensors were being signed off as late as 19/5/14 having provided identical evidence to other applicants who had been refused.

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4.3 One of the most extreme examples is a case where there are two boilers, one 600kw and one 300kw which are a mere 2 meters apart. Both with identical meters and strap on sensors. Both fitted in the same way. One has been accepted onto the scheme, the other not, and it is the system that was fitted first that has been turned down!

4.4 Many applicants were not informed of any issue with temperature sensors until several months (six months in my case) after application.

4.5 In February 2014 Ofgem wrote to Meters UK (appendix 1) in reply to Meters UK's request to know why its meters and sub-assemblies were not being accepted in some applications. In their reply Ofgem stated that they had received information from an applicant that showed that the meters were compliant and that the *"matter is closed".*

4.6 At the same time as that letter was sent, and since the letter was sent, applicants with Meters UK meters and strap on temperature sensors have given the same evidence and have seen their application refused.

4.7 Meters UK continues to sell meters with strap on sensors to installers as they have not been informed by Ofgem that they do not comply.

4.8 Ofgem's RHI guidance allows for Certificates of Conformity yet in many cases they are not accepted.

4.9 Meters UK Certificate of Conformity is accepted as proof of compliance in some cases but not others.

4.10 The EC MID allows for one certificate to cover the Heat calculator and temperature sensors when tested together. (appendix 2)

4.11 Ofgem fail to point this out in correspondence instead asking for either one certificate to cover all components or three, one each for heat calculator, temperature sensors and flow meter.(Appendix 4)

4.12 If Ofgem are not even aware that the MID allows for this it is not surprising they fail to recognise it when they see it.

4.13 Ofgem have asked applicants with Meters UK heat meters for installation details and photographs of applicants meters in situ.

4.14 As far as I can find no other meter manufacturers meters have required this scrutiny.

4.15 The EC MID makes no mention of how meters and sub-assemblies are installed and gives no requirement.

4.16 The EC MID does not prohibit the use of strap on sensors.

4.17 It remains unexplained as to why these details were useful in accepting or rejecting installations.

4.18 Having received identical manufacturers fitting instructions for different installations, and virtually identical photographs of temperature sensors fitted in line with those instructions, some installations were accepted onto the scheme and others rejected.

4.19 Ofgem refuse to give an explanation for this disparity.

5. Strap on Temperature Sensors Accuracy.

5.1 Ofgem state that they had issues with temperature sensors in *"Sept 2013"*

5.2 Ofgem later stated on 18th March 2014 that they had issues with Meters UK strap on sensors, although in that letter they had only *"recently become aware"* of those issues.

5.3 Meters UK Ltd have supplied Ofgem with a detailed explanation of their methods of calibration for strap on sensors with a full explanation of how this meets the EC MID standard.

5.4 Ofgem have not challenged Meters UK Ltd's document.

5.5 Meters UK Ltd, have outlined to Ofgem how, as an ISO9001 manufacturer, they test each strap on temperature sensor for accuracy.

5.6 Ofgem have not responded to or challenged these methods.

5.7 In February 2014 Ofgem wrote to Meters UK and the letter which referenced their HCM4 meter and sub assemblies and explicitly stated that their meter was compliant and that Ofgem had *"now closed this matter".*

5.8 On Feb 18th 2014 Chris Wickens RHI team principal engineer stated on a DECC blog site that *"No amount of cable ties, tape, conductive paste and insulation is going to make a temperature sensor read the temperature of the fluid inside the pipe if it's strapped onto the outside of it. Installing temperature sensors like this will mean that the heat reading is too small and therefore the RHI payment is also too small."*

5.9 Mr Wickens provided no scientific data to back up this claim.

5.10 It would appear from Mr Wickens blog that in Ofgem's opinion the use of strap on temperature sensors may result in under payments to applicants.

5.11 Ofgem therefore deem that there is not a risk to the overall cost of the RHI scheme and no risk to the public purse if installations with strap on sensors are allowed onto the RHI scheme.

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5.12 Ofgem have provided no scientific evidence to manufacturers or applicants, whether that be theoretic or test based, to show that digital strap on sensors are not accurate.

5.13 Meters UK claim that he same Strap on sensors that are being accepted on some applications (but not others) are currently used perfectly well in other applications in a number of public and Governmental buildings. They are deemed fit for purpose as they meet the Weights and measures Act.

6. Does Meters UK HCM4, including Strap on Temperature sensors comply with the EC MID and/or Ofgem RHI guidance?

6.1 Whether the EC MID should legally and rightfully be the standard for RHI heat meters, the EC MID is the standard that Ofgem are supposed to be following.

6.2 The most common heat meter that uses strap on sensors appears to be the HCM4, produced and manufactured in Britain by Meters UK Ltd.

6.3 Analogue heat meters need 3 parts to function, a calculator, a flow meter and temperature sensors. Digital meters are made of two parts, a heat calculator with integral temperature sensors and a flow meter.

6.4 The HCM4 is a digital meter with strap on temperature sensors that are integral to it.

6.5 The HCM4 meter is certificated as a Class 1 heat meter. The highest and most accurate standard. It is the only Class 1 heat meter in the world.

6.6 The MID specifies details of tests that pertain to testing *"analogue"* temperature sensors. The prescribed testing method for heat meters in the EC MID is EN 1434. This test is for analogue meters and sub-assemblies and is not transferable to digital.

6.7 The HCM4 cannot be tested via the prescribed test in the EC MID as it is digital and the analogue tests do not relate to it. It would be akin to testing a digital radio with an FM transmitter.

6.8 EN1434 does accept other methods of temperature measurement other than analogue can be used. However it does not offer a test for digital sensors.

6.9 EN1434 sect 3.4 (Appendix 2) states *"other types of temperature sensors are permissible but shall be tested as part of the calculator"*.

6.10 Meters UK has had its HCM4 meter tested by the National Measurements office with the sensors fitted as "part of the calculator" in compliance with EN1434.

6.11 Ofgem is rejecting this certification with no explanation as to why it fails to meet part 3.4 of EN1434.

6.12 EN1434 states that temperature sensors can be *"for mounting with or without pockets"*

6.13 EN1434 and therefore EC MID allows for, but does not set out an internationally recognised test for, the use of digital strap on temperature sensors alone.

6.14 According to the National Measurement office a Certificate of Conformity issued by an ISO9001 manufacturer *"is always accepted"* as part of the MID.

6.15 Ofgem's Guidance States that *to "demonstrate that the meter used for RHI purposes meets the eligibility requirements" "a copy of the manufacturer's declaration of conformity could be used."*

6.16 Meters UK Ltd are an ISO 9001 manufacturer and have supplied a certificate of conformity.

7. Have Ofgem Followed the EC MID

7.1 The EC MID pg 4 item (19) states *"Manufacturers should be informed of the grounds on which negative decisions in respect of their product were taken and of legal remedies available to them"*

7.2 Ofgem has not written to Meters UK Ltd to inform them that applications with their product are being turned down.

7.3 Ofgem have not followed the EC MID requirement laid out above.

7.4 In not following the requirement Ofgem may be restricting the trade of Meters UK Ltd and may be subject to legal action.

7.5 If Ofgem had written to Meters UK, it is difficult to imagine what *"legal remedies"* Ofgem would offer to them as the meters and sub-assemblies already comply with UK law on the basis of the Weights and Measures Act.

7.6 According to the National Measurements Office the EC MID *"always allows"* for ISO9001 manufacturers to offer Certificates of Conformity for components.

7.7 According to section 1.17 of Ofgem's Renewable Heat Incentive Guidance a *"manufacturers declaration of conformity could be used"* to *"demonstrate that the meter meets the eligibility requirements"*

7.8 Meters UK have provided a *"Certificate of Conformity and Calibration".*

7.9 Ofgem rejected this certificate on some occasions (mine included) whist accepting it on others.

7.10 EC MID pg3 section (9) states that "*Community legislation should specify essential requirements that do not impede technical progress"*

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7.11 EC MID pg3 section (13) states *"Conformity with the essential requirements laid down by this Directive can also be provided by specifications that are not supplied by a European technical standard or an internationally agreed normative document. The use of European technical standards or internationally agreed normative documents should therefore be optional."*

7.12 Meters UK's HCM4 meter is the only class 1 meter in the world. It is digital. All previous meters were analogue. Its strap on sensor is integral to the meter. This could easily be argued as technical progress.

7.13 The prescribed testing method for heat meters in the EC MID is EN 1434. This test is for analogue meters and not transferable to digital.

7.14 The MID allows for *"Declaration of Conformity Based On Quality Assurance of the Production Process"*

7.15 The National Measurements Office the EC MID "always allows" for ISO9001 manufacturers to offer Certificates of Conformity for components.

7.16 There is no UK or international recognised independent test for the digital sensors.

7.17 By not following the EC MID in relation to Declaration of Conformity and not using the European technical standards as *"optional"* Ofgem could be considered to be stopping "technical progress" and therefore not following the EC MID requirements.

7.18 It is not clear why Ofgem refuse to take this option. Ofgem have offered no reason.

7.19 FOI requests in connection with these issues made by myself and by Meters UK Ltd have both been turned down by Ofgem so it is unclear why this situation has arisen.

8. Existing Applicants With strap on Temperature Sensors.

8.1 Some existing applications date back in excess of 12 months.

8.2 The tariff for RHI reduced on July 1st 2014.

8.3 Ofgem have told applicants that if they change to *"pocket sensors*" they will be accepted onto the RHI scheme but the effective start date for payments would be the date that they were changed.

8.4 If for example I change I will then be on the lower tariff for 20 years and can expect a reduction in my return over 20 years to be approximately £20,000.

8.5 If this occurred I could potentially claim against my installer as I was offered projected figures that without doubt would then be inaccurate.

8.6 If installers have a number of applicants who claim, it could force them of business.

8.7 It is possible that installers may claim against Ofgem or their heat meter supplier.

8.8 It is possible that the manufacturers and suppliers of strap on sensors contest their compliances eligibility for the RHI through the courts.

8.9 A decision that prevents existing applicants who have strap on sensors from being accepted onto the scheme is likely to be the catalyst for legal actions.

8.10 If existing applicants were allowed to change their sensors and still have their start date as per the original application this would prevent much of the potential legal action.

8.11 If strap on temperature sensors that comply with the Weights and Measures Act are accepted then existing applications can be processed.

9. Conclusion

9.1 Ofgem has acted inconsistently with its application procedure allowing some applications onto the scheme with strap on sensors whilst refusing others with the same sensors, all during the same time period.

9.2 Ofgem have not treated all applicants fairly and equitably.

9.3 Ofgem have not followed their own guidance.

9.4 Ofgem is regulating to a standard that is not recognised in UK law. This may leave it open to legal action.

9.5 Ofgem has not given any indication that it is concerned that it operates within UK law, instead passing the buck to the DECC.

9.6 The DECC should explain why it chose to use the EC MID and who made that decision.

9.7 Ofgem have failed to follow the EC MID standard that has, rightly or wrongly, been used for strap on temperature sensors.

9.8 Ofgem's reluctance not to accept ISO 9001 manufacturers Certificate of Conformity and Calibration is unexplainable. Especially so, as the same certificates have been accepted on some applications.

9.9 Analogue and Digital meters will have slightly different certification for the EC MID. The EN1434 test criteria (see appendix 2) shows that Analogue meters needs 3 certificated parts, heat calculator, flow meter and temperature sensors, whilst digital meters need 2 certificated parts, one for the heat calculator WITH integral temperature sensors and one for the Heat calculator.

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9.10 Meters UK's HCM4 digital meter with integral strap on temperature sensors has been tested to Class 1 of the EC MID by the National measurements Office. Ofgem on many applications are inexplicably refusing to accept this certificate.

9.11 Ofgem state that they have had *"concerns"* about strap on temperature sensors since at least September 2013 but are known to have accepted installations with identical sensors on installations as late as May 2014.

9.12 Ofgem failed to contact Meters UK (as the EC MID says they must) after February 2014 when they had told Meters UK that installations with their meters and strap on temperature sensors were *"compliant".* As such Meters UK, quite rightly continued to sell their meter with strap on sensors to installers for Commercial RHI purposes.

9.13 Ofgem has been asked to administer the Commercial RHI scheme by the DECC with the heat meter standard set as the EC Measuring Instruments Directive. (EC MID)

9.14 After a public consultation the UK government chose "not to subscribe" to the EC MID in relation to heat meters, this includes their sub-assemblies. Conformity to The Weights and Measures Act is the legal standard in the UK.

9.15 Legal clarification is needed to confirm what standard Ofgem can legally regulate to.

9.16 Applicants who applied for the scheme before the publication of the result of this consultation (historical applicants) should be accepted onto the scheme with payments backdated to the time of application.

9.17 Ofgem's concern appears to be that strap on sensors may result in applicants under- claiming for the scheme. As such there is no financial risk to the public purse by accepting historical applicants onto the scheme.

9.18 Accepting historical applicants will negate legal challenges.

9.19 Accepting historical applicants will put confidence back into the RHI scheme.

9.20 Accepting historical applicants will protect British Jobs and British Manufacturing.

9.21 Accepting historical applicants will provide conditions for Ofgem and the DECC to move forward with the scheme on a solid legal basis.

9.22 Accepting historical applicants will provide conditions for the DECC and Ofgem to move forward with the scheme without the politically difficult stance of using an EU directive that the UK opted out of.

9.23 Ofgem have publicly denounced strap on sensors offering no science to back up their negative claims. This may have restricted the ability of manufacturers to trade.

9.24 Ofgem will not allow at least one manufacturer to offer Certificates of Conformity in line with its ISO9001 status and in line with the requirements of the EC MID and its own guidance.

9.25 Meters UK have provided mathematical and scientific evidence that their digital HMC4 meter, along with its integral strap on sensors meet the requirement of The Weights and Measures Act, and via their ISO9001 status, the EC MID.

9.26 Ofgem have provided no mathematical or scientific evidence to dispute Meters UK claims.

9.27 Ofgem should ask the DECC to reconsider which standard to use for Heat meters.

9.28 Until scientific evidence is produced to counter Meters UK's testing and manufacturing procedures and its ISO 9001 status their strap on sensors, aligned with a digital meter, should be accepted as accurate and allowed onto the scheme.

9.29 Ofgem and the DECC may face legal challenges in terms of restriction of trade.

Email response from Edmund Ward, Head of Technical, Development and Continuous Improvement Non Domestic Renewable Heat Incentive at Ofgem, to questions from Paul Jones.

12/8/14

Ofgem request that heat meters and their assemblies meet the standards laid down in the EC Measurement Instrument Directive (EC MID). After a public consultation the UK Government chose not to prescribe to this directive for heat meter standards and as such UK law relies on the Weights and Measures Act to set the standards for heat meters.

1. Is Ofgem aware that the EC MID has no legal basis for heat meter standards in the UK?

Ofgem's Response: *The Gas and Electricity Markets Authority (GEMA) is the named administrator of the RHI scheme under the Renewable Heat Incentive Scheme Regulations 2011 (as amended) (RHI Regulations). GEMA does the day to day administration via its office Ofgem in accordance with the RHI Regulations. Ofgem cannot act beyond the scope of the powers provided in the RHI Regulations. Under the RHI Regulations, all installations are required to have a class 2 heat meter .*

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The RHI regulations defines "class 2 heat meter" as a heat meter which—
a) Complies with the relevant requirements set out in Annex 1 to the Measuring Instruments Directive,
b) Complies with the specific requirements listed in Annex MI-004 to that Directive, and
c) Falls within accuracy class 2 as defined in Annex MI-004 to that Directive

2. Is Ofgem legally entitled to regulate to standards that go beyond UK law?

***Ofgem's Response**: As per our response in 1 above, Ofgem is administering the RHI scheme in accordance with RHI Regulations.*

3. Is Ofgem aware why the EC MID was chosen as the standard considering that all of the heat meters standards in the world, as far as I can find, the EC MID is the only heat meter standard that the UK Government appears to have explicitly rejected?

***Ofgem's Response:** Ofgem's role is to administer the RHI Regulations. The Department of Energy and Climate Change is responsible for developing the policy framework and supporting legislation, so we cannot comment on the reasoning behind the government policy.*

4. Can I use the Weights and Measures Act to demonstrate that my heat Meters are legally compliant for UK law and therefore acceptable for a UK Government run scheme?

***Ofgem's Response:** Under the RHI Regulations , all installations are required to have a class 2 heat meters .*
The RHI regulations defines "class 2 heat meter" as a heat meter which—
(a)Complies with the relevant requirements set out in Annex 1 to the Measuring Instruments Directive,
(b) Complies with the specific requirements listed in Annex MI-004 to that Directive, and
(c) Falls within accuracy class 2 as defined in Annex MI-004 to that Directive
The RHI Regulations requirement is what we would apply when considering whether your installation meets the metering eligibility criteria for the RHI Scheme. "

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