Network Innovation Competition Full Submission

Supplementary Answer Form

Tick if this answer is Confidential: ☐

Tick if this answer has been provided verbally: ☐

Project code:	NGN GN 01	Question Number	1
Question date	15.08.2013	Answer date	19.08.2013
Submission section question relates to	Section 2		
Topic	Alternative Technologies		
Question	It is noted that there has been minimal technological development/assessment of alternative preheating equipment in the UK in the past 20 years. Is there any international experience of the use of the proposed alternative technologies for gas preheating that would provide learning relevant to this project?		
Notes on question			
Answer	Our partners in this project both have international experience, Bruest, based in Kansas, USA, supply HotCats within North America. The Managing Director of Proheat worked previously for CWT, Canada, where they also supplied preheating equipment within North America. From our partners' experience we can gather that the alternative technologies are proven overseas. However, the UK has different standards to North America and as such each technology needs to be developed for the UK market and obtain G17 approvals. This development has not been carried out in the UK at the scale proposed by this project. Although both technologies are installed overseas, we do not believe that similar research into the system efficiencies and carbon emissions has been carried out. For example, Bruest (HotCat manufacturers) claim in their literature that the HotCat is 70% efficient. However, whilst obtaining quotations from Bruest to provide high level costs to support our business case, it appeared that they prefer to size their equipment whilst only assuming a heat transfer efficiency of 40%. This may appear low, but we can only actually quantify the figures through the assessment of overall efficiency by using the robust model that we have created. Bruest are		

	quoting what they believe their *heat transfer efficiency* to be, they have not looked at the overall efficiency by taking into account some of the benefits that they have over their competitors. For example, they have extremely close control of the downstream gas temperature and as such have minimal overheating wastage (Qco) and zero energy wastage which would have resulted from the large thermal inertia of water (Qth). We have a similar problem for the boilerhouses, Waterbath heaters and LP Steam systems. All manufacturers will claim an efficiency figure without actually measuring what the equipment is doing in a field trial. For example, Potterton claim that their boilers have a seasonal efficiency of around 94% (condensing boilers), but this is only relative to the *heat transfer efficiency* of the boilers themselves, it does not take into account aspects such as the number of kilowatt hours of electricity associated with achieving this heat transfer (Qe). We believe that our robust methodology takes all aspects of energy use into account. The unique part of our proposed field trials is that we are planning to *calculate*, on an hourly basis, the amount of energy required to heat the gas stream to the desired set point. We will then *measure* the energy used to achieve this, in real time. These figures will then be used to calculate the overall system efficiency. We are not aware that this has been done before for any of the technologies that we are proposing to research, either in the UK or internationally. Learning that will be taken into account from our international partners will be in their experience of maintenance costs. This will provide a more accurate whole life cost value of each of the items of alternative technology as the experience of our partners will provide information on anticipated problems learned through their experience. Once we develop the model to more accurately show maintenance and upgrade costs in our whole life cost calculations, our partners will be invaluable.
Attachments	None
Verbal Clarifications (Consultants)	