

Editorial

Nick Jenkins PhD, FREng, FIEEE, FIET
Institute Leader, Institute of Energy, Cardiff University, UK



I was very pleased to be asked to chair the Editorial Advisory Board of *Proceedings of the ICE, Energy*. The energy scene in the UK, and indeed worldwide, is changing rapidly as nations strive to meet the energy needs of their citizens while limiting environmental impact. Reflecting on the particular contribution that *Energy* can make, it seems to me that in addition to the intellectual rigour that is demanded of any learned journal it needs to strive to be accessible to non-specialists in the particular subject under discussion and to demonstrate the importance and consequences of the work. I hope to encourage both papers and briefings that reflect these goals.

In this issue, the briefing addresses an important and topical issue (Sheng *et al.*, 2012). Underground coal gasification (UGC) is not a new concept but the project that is reported combines UGC with carbon dioxide capture and geological storage to allow the exploitation of deep coal seams while minimising carbon dioxide emissions. As the UK seeks to decarbonise its power sector towards around 50 gCO₂/kWh_{elec} it does seem short sighted that more attention is not paid to innovative ways to use fossil fuels while capturing and sequestering carbon dioxide.

The first of three research papers describes a site investigation of an office cooling system with a phase-change material tank (Susman *et al.*, 2012). The system was monitored over a period of six days and during that time the addition of the tank of phase change material appeared to increase the use of energy. The paper examines the reasons for this disappointing result and concludes with a discussion of the practical relevance of the work and suggestions for how an alternative design of the system might have made more effective use of the phase-change material.

A second paper describes experience of two wood gasifier generation systems (250 kW_{elec} and 10 kW_{elec}) in Uganda (Buchholz *et al.*, 2012). Although both were in commission in 2007 they are now no longer used. At one site the electricity grid has been extended to it and at the other the farmer left the area. The paper concludes that while generation from a wood gasifier can be competitive with a diesel-fuelled engine, for economic operation a stable electrical load close to the rating of the system is required. The use of some of the waste

heat from the engine increased the economy of the larger system substantially.

A final paper describes a case study analysis of the mass-retrofitting of domestic building in an energy efficient low carbon dioxide zone (Deakin *et al.*, 2012). It highlights the difficulty of ensuring social equity while retrofitting buildings of various ages and with different ownership structures.

All three papers, in their different ways, demonstrate the challenges of ensuring effective supply and use of energy in real situations. The first paper illustrates the well-known problem of building energy systems that do not perform as originally hoped. Providing AC electrical energy in remote areas of developing countries is notoriously difficult as the operator of the generator has the same technical challenge as National Grid, of maintaining frequency and voltage (admittedly at a smaller scale), but with a tiny fraction of the resources. In this case, the lack of a constant load near the rating of the system led to poor economy. Finally, as the UK moves to try to reduce energy consumption within domestic buildings, policy makers and interested parties have to confront the radically different ages of buildings, and hence possibilities for reduction in their energy use, as well as different ownership structures.

REFERENCES

- Buchholz T, Da Silva I and Furtado J (2012) Power from wood gasifiers in Uganda: a 250 kW and 10 kW case study. *Proceedings of the Institution of Civil Engineers – Energy* **165**(4): 181–196, <http://dx.doi.org/10.1680/ener.12.00005>.
- Deakin M, Campbell F and Reid A (2012) The mass-retrofitting of an energy efficient low carbon dioxide zone. *Proceedings of the Institution of Civil Engineers – Energy* **165**(4): 197–208, <http://dx.doi.org/10.1680/ener.12.00004>.
- Sheng Y, Hristov N and Green M (2012) New life for old coal. *Proceedings of the Institution of Civil Engineers – Energy* **165**(4): 165–167, <http://dx.doi.org/10.1680/ener.11.00026>.
- Susman G, Dehouche Z, Craig S and Hassan R (2012) Energy performance of an office cooling system with phase-change material tank. *Proceedings of the Institution of Civil Engineers – Energy* **165**(4): 169–180, <http://dx.doi.org/10.1680/ener.11.00038>.