

International Conference on Sustainability in Energy and Buildings Invited Sessions

Title of Session: Microgeneration Systems for Domestic Combined Heat and Power

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Description:

About 30% of the UK's CO₂ emissions are due to domestic energy consumption¹. Carbon emissions from conventional fossil-fuel electricity generation are increased significantly by the inefficiency of the generation process and energy wastage due to losses during the transmission of power. Governments in the UK, the EU and much of the rest of the world, aim to increase the proportion of energy that is produced through Micro Combined Heat and Power (Micro-CHP) systems. Novel low-cost Micro-CHP systems, that generate power near to the point of use, and also achieve increased efficiency by the use of "waste" heat for water and space heating, can provide a considerable reduction in fuel use, resulting in a significant reduction in CO₂ emissions. Further benefits can also be achieved from the use of renewable energy sources in Micro-CHP systems.

Some techniques for local energy production are increasingly being applied, for example, the use of roof-mounted photovoltaic panels and small wind turbines for the local generation of electricity, also solar thermal panels for the production of hot water. However, being dependent on weather conditions, these do not form a reliable energy supply, and can only supplement mains electricity and gas supplies.

Hybrid systems take the micro-CHP concept of generating power near to the point of use a stage further, by combining micro-CHP with several other low-carbon-impact energy generation mechanisms to provide space heating and domestic hot water in addition to electricity. During times when sun-light is available, electricity and hot water are generated by the photovoltaics and solar-panel. At times of appreciable wind speed, electricity will be generated by the wind turbine. At times of low solar gain, low wind, or when demand is high, the microgeneration-CHP system may be called into play or grid supplies may be used.

The aim of this invited session is to provide a forum for the presentation of papers on micro-generation systems, micro combined heat and power systems, and hybrid energy systems involving more than one source of energy. Papers are invited on the following topics, or other related areas:-

- Micro-generation units
- Small scale combined heat and power systems
- Hybrid energy systems combining two or more renewable or low-carbon energy sources
- Hybrid energy systems involving both electricity and thermal energy generation
- Energy systems involving one or more renewable energy sources and an energy storage system
- Modelling and simulation of hybrid energy systems
- Instrumentation, sensors and control of energy systems
- Conventional and bio fuels applicable to microgeneration units
- Energy storage systems

¹Office for National Statistics

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