

THE IMPORTANCE OF ENERGY QUALITY IN MATCHING SUPPLY AND DEMAND

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Energy used in buildings accounts for around half of the UK's total carbon emissions. Most of this energy is used for space heating, so minimising heat losses is a high priority. The heating requirement of buildings is primarily dependent on the building fabric, so less energy is needed to heat better-insulated buildings. However, the quality or grade of energy needed for space heating is very low. Low-grade energy, eg industrial waste heat, is available in large quantities and can be used in low-temperature internal distribution systems, such as underfloor heating. Adopting lower building-heat distribution temperatures increases the availability and viability of a wide range of low-carbon and renewable heat sources.

This Information Paper examines the importance of energy quality in matching energy supply and demand and will be of interest to those working in the field of energy in buildings, including building services engineers, building contractors and specifiers.

INTRODUCTION

Buildings generally use very-high-grade energy derived from fossil fuels (Figure 1). By recognising that the energy quality required in buildings varies significantly according to purpose, the energy supply can be adapted to maximise efficient use of resources. This integrated approach offers opportunities to maximise the use of freely available heat and renewable energy technology.

The aim of this Information Paper is to draw attention to the fact that energy has a quality aspect and that the energy quality used for heating often far exceeds that which is necessary. It explains how it is necessary not only

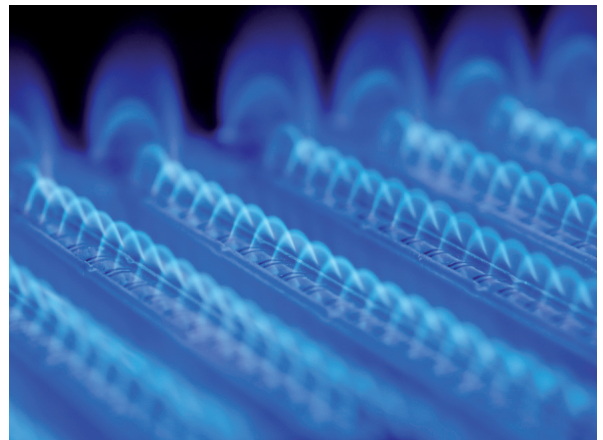


Figure 1: Different forms of very-high-grade energy

to reduce energy demand but also to provide the energy needed in the most appropriate and beneficial manner. Appliances will always have to be supplied by high-quality energy in the form of electricity; it is, however, possible and advantageous to supply heat from lower-quality sources. The Appendix explains the scientific principles behind energy quality.

