

ENERGY EFFICIENCY

An energy efficient building provides the required internal environment and services with minimum energy use in a cost effective and environmentally sensitive manner. There is therefore no conflict between energy efficiency and comfort, and it should be combined with other aspects of sound engineering practice.

Energy efficiency drivers

Buildings consume nearly half the energy used in the UK. All building professionals have a responsibility to reduce this through good practice. Tangible benefits from energy efficiency ranging from the individual to the national level are:

- Improved design and operation of buildings
- Better working environments
- Life cycle cost savings
- Environmental benefits mainly through reduced emissions of carbon dioxide and reduced consumption of finite fossil fuels. Energy efficiency is a key performance measurement in most environmental management systems

The energy bill for most existing commercial and public buildings could be reduced by at least 20% using measures regarded as cost effective by most common investment criteria. New buildings and refurbishment represent even greater potential. New low-energy buildings consume at least 50% less energy than similar existing buildings and 20% less than typical new buildings.

Environmental issues

Burning fossil fuels contributes to atmospheric pollution, resulting in a wide range of damage to both the environment and public health. Improving energy efficiency will help reduce global warming. Under the Kyoto protocol the UK government is committed to reducing the emission of carbon dioxide to 12.5% below 1990 levels by the year 2010, and have set a more stringent internal target to reduce it by 20% by 2010.

Design Process

The process of energy efficient design should always include:

- Identification of user requirements
- Designs that meet these requirements with minimal energy use

- Establishment of an integrated design team with a brief and contract that promotes energy efficiency
- Energy targets set at an early stage, for each fuel and individual end uses and designing within them
- Designs focused on manageability, maintainability, operability and flexibility
- Checks that the final design meets the targets and that the selected equipment conforms with product performance benchmarks.

Success depends on understanding the interactions between people, building fabric and services. This integrated design approach requires the successful collaboration of client, project manager, architect, engineer and quantity surveyor at the early conceptual stage of the project.

To realise energy efficient designs each stage of the contract needs to be carefully assessed to ensure that the design intent is followed through proper procurement and careful and thorough commissioning to actual performance, and the predicted returns realised.