THE MERTON RULE

A REVIEW OF THE PRACTICAL, ENVIRONMENTAL AND ECONOMIC EFFECTS

The London Borough of Merton was the first local authority to formalise the Government's renewable energy targets in its Unitary Development Plan. The council pledged to provide at least 10% of the energy needs for all its new major developments from renewable energy technologies.

The 'Merton Rule' quickly became accepted as good practice and a means of encouraging innovation to reduce carbon dioxide emissions from buildings. However, it has also been criticised as a 'bolt-on' approach to energy efficiency which is not applied on a level playing field and that is ultimately, a financial burden for developers.

As a result, local authorities have interpreted and applied the Merton Rule in different ways. Some insist solely on the 10% renewable energy requirement whilst others simply recommend that energy efficient measures be implemented as a first step to achieving CO_2 emissions reductions.

In December 2008, BRE's Strategic Assessment and Evaluation Team reviewed these claims on behalf of the NHBC Foundation[1] and produced an independent assessment of the practical, environmental and economic effects of the Merton Rule to date.

THE BRE APPROACH

BRE's Strategic Assessment and Evaluation Team carried out a survey amongst developers and analysed anecdotal evidence gathered from industry professionals. Our objective was to ascertain whether the Merton Rule has helped or hindered the quest to provide 100% zero-carbon homes by 2016.

In addition, our experts evaluated the respective costs of achieving a 10% reduction in energy use by means of either making improvements to the building envelope and services or adding renewable energy installations only. We then analysed which approach would yield a greater long-term reduction in CO_2 emissions.

As part of the review process, we also:

- Assessed the practical measures which could be used to achieve these emissions reductions
- Carried out an economic assessment of the options in order to quantify the financial impact for residential developers
- Identified the short and long term costs per tonne of CO_2 saved.

KEY OUTCOMES

Our industry survey showed that the implementation of certain policies associated with the Merton Rule has increased the use of renewable energy technologies in new-build housing. However, there does not seem to be a corresponding rise in the implementation of energy efficiency measures to the building envelope.

Results from the survey informed the selection and development of three scenarios which we then tested using building energy modelling techniques on a hypothetical development. The scenarios were:

1. Achieving a 10% reduction in energy use by implementing improvements to building fabric and services

2. Achieving a 10% reduction in energy use through the implementation of renewable energy technologies

3. Achieving a reduction in energy use through the combined effects of scenarios 1 and 2.

1 The full published report (NF11) can be downloaded free of charge from www.nhbcfoundation.org

The modelling clearly demonstrated that the most cost effective way of reducing energy consumption (by approximately 10%) lies in improving building fabric and services. The greatest lifetime reduction in CO_2 emissions, however, was achieved from implementing renewable energy technologies. This was 4.2 times higher in cost per tonne of CO_2 saved for only an additional 1.1% reduction in energy use.

Combining improvements to building fabric and services to achieve approximately a 20% reduction in energy use was cheaper per tonne of CO_2 emissions reduced than by achieving a 10% reduction by using renewables alone.

Thus, our Strategic Assessment and Evaluation Team concluded that improvements to building fabric and services should be implemented first with additional renewable energy installations to follow.

Enhancing the thermal performance of the building envelope helps to future-proof the structure and also yields the greatest CO_2 savings. Adding renewable technologies will then yield maximum emissions reductions with lower long-term costs for the construction industry. This was found to be the most cost effective, holistic solution for achieving the challenging Code for Sustainable Homes energy targets.

***Note**: Since the modelling was carried out, a rise in energy prices has occurred and further, large energy suppliers will be required to pay feed-in tariffs to those generating and exporting electricity from renewable technologies. Both of these may impact on payback periods for renewable energy installations.*

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