

## Project Title Sustainable Homes – the financial and environmental benefits

### Science Summary SC040050/SS

In 2005, the Environment Agency assessed the financial and environmental costs and benefits of building new homes to higher standards of resource efficiency, in response to plans for significant housing growth in the South East and elsewhere.

We looked at the extra costs of improving the resource efficiency of new homes and communities by reducing water and energy use and domestic waste generation. We also considered the wider environmental impact of new developments and their infrastructure. We looked at the benefits in terms of reduced water and fuel bills, increased value of homes, reduced transport costs and macro-infrastructure requirements, health and environmental benefits.

Early chapters in this report of the study describe the policy background and the current environmental and resource efficiency standards for houses. We then introduce two possible measures of improved resource efficiency compared to current standards for new buildings: 'achievable' and 'aspirational'. Details are given of these two standards, with figures for the kinds of improved efficiencies that would be expected under each.

The following two chapters (4 and 5) go on to consider the financial implications of these two standards in terms of costs and benefits respectively. Particularly notable conclusions reached are that:

- A 25 per cent improvement in resource efficiency has a maximum extra capital cost of £800 per home.
- These improvements produce savings for residents through reduced utility bills of approximately £138 a year. The total benefits of resource efficiencies would be much greater than this if we could quantify the wider effects on the environment, health, etc.
- Even if costs were passed on to the house buyer, only up to £4 per month (£48 per year) would be added onto a typical £100,000 mortgage. Therefore, more efficient homes can be more affordable overall, particularly for those on low

incomes who spend a higher proportion of their income on bills.

- Even higher resource efficiency savings could be achieved by providing incentives to householders, by designing developments to encourage changes in behaviour, and by investing in micro-infrastructure such as greywater systems, solar heating or anaerobic waste digesters.
- The cost of higher standards will fall with technological development and economies of scale, while utility bills may continue to rise. Failing to build more resource efficient housing foregoes significant benefits to households, society and the environment. Investments now would also avoid costly corrective measures later.

These costs and benefits are summarised and considered over a 25 year period at two different interest rates in Chapter 6. This finds that if *achievable* standards are met, the total benefits after 25 years will definitely be greater than costs. If *aspirational* standards are met, the total benefits after 25 years will be within the range of costs.

Having shown that some degree of resource efficiency improvement is almost certainly worthwhile from a purely financial and social perspective the report goes on to consider two key issues in implementation of resource efficiency: what instruments are available to force or encourage the adoption of the standards? and who bears the additional cost (if any) and who benefits?

The report concludes by recommending that the 25 per cent or so resource efficiency improvements associated with *achievable* standards should be incorporated into the current proposed amendments to the Building Regulations and that the Code for Sustainable Buildings should be set at standards above these. In addition, the Government should make it clear that regulations will be tightened further over the next 10 to 15 years, such that our *aspirational* standards become the norm and housing developments as wider systems become more sustainable.

The conclusion also notes current gaps in our knowledge of resource efficiency in housing, where further research and case studies would be useful.

This report should be useful to anyone interested in resource efficiency in housing, including Environment Agency staff, national and local governmental staff, architects and designers, building contractors and also individual householders.

This summary relates to information from Science Project SC040050, reported in detail in the following output:

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**Project manager:** Bruce Horton, Rio House, Bristol

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