Case Study 189

#7202

Benefits to the Landlord of energy efficient housing

Bristol City Council

- Significant increase in rent revenue; reduced voids, complaints and transfer requests; lower total maintenance costs
- Total non-energy benefits worth twice as much as the potential energy savings
- Simple payback period of 14 years based on non-energy benefits alone, reduced to 9 years when energy savings included
- Comprehensive package of insulation, heating and ventilation provision applied to 2 estates

Background

Bristol City Council manages approximately 37 000 dwellings. They are concentrated in the city centre and outlying suburbs. The nature of the housing stock is diverse, encompassing most types of public sector housing, from terraced street property to system-built blocks of flats.

Since 1988, Bristol City Council has had a stated commitment to provide affordable warmth in its housing. It has achieved this by improving heating systems, upgrading thermal insulation and balancing ventilation.

The council has undertaken an energy and condition survey of its housing stock which has allowed investment decisions to be based on benefit and need. Energy efficiency measures are not only included in the council's refurbishment programmes but have also been incorporated into regular maintenance works whenever the opportunity exists.

Recognising the importance of a comprehensive approach, Bristol City Council has backed up its programme of technical measures; by providing comprehensive energy advice for its tenants, and energy awareness training for council officers.

Introduction

Two refurbishment projects based on typical examples of the council's housing stock were assessed by BRECSU to identify the energy and non-energy benefits resulting from improvement works.

Energy benefits are easily defined as the reduction in fuel costs plus the increase in warmth resulting from improvements made to a building by one or more insulation measures. These benefits can be measured by a straightforward comparison of fuel use before and after improvement.

The non-energy benefits accruing to the landlord are not so readily apparent; initial difficulty can be experienced in identifying and measuring them. However, current research indicates that once quantified, the benefits can be equal to or greater than the fuel benefits and provide a strong argument in favour of energy efficient refurbishment.

The following are examples of potential benefits to the landlord: reductions in maintenance costs, transfer requests, complaints, vandalism, void property, rent arrears and condensation cases; and an increase in asset values.

"Non-energy benefits should be taken into consideration when making refurbishment decisions."

BEST PRACTICE PROGRAMME

Energy Efficiency Office
DEPARTMENT OF THE ENVIRONMENT

BENEFITS TO LANDLORDS

BRISTOL CITY COUNCIL

Wessex House – Before

Wessex House – After

Wessex House

Wessex House, built in 1924 and situated on the Lawfords Gate estate, is a 3-storey block of 18 flats, of solid brick construction. The block received a package of improvement measures during 1989-90, a number of which were aimed at improving its energy performance. The measures included: external wall insulation, roof insulation, ground floor insulation, double glazing, heat recovery ventilation and gas-fired central heating.

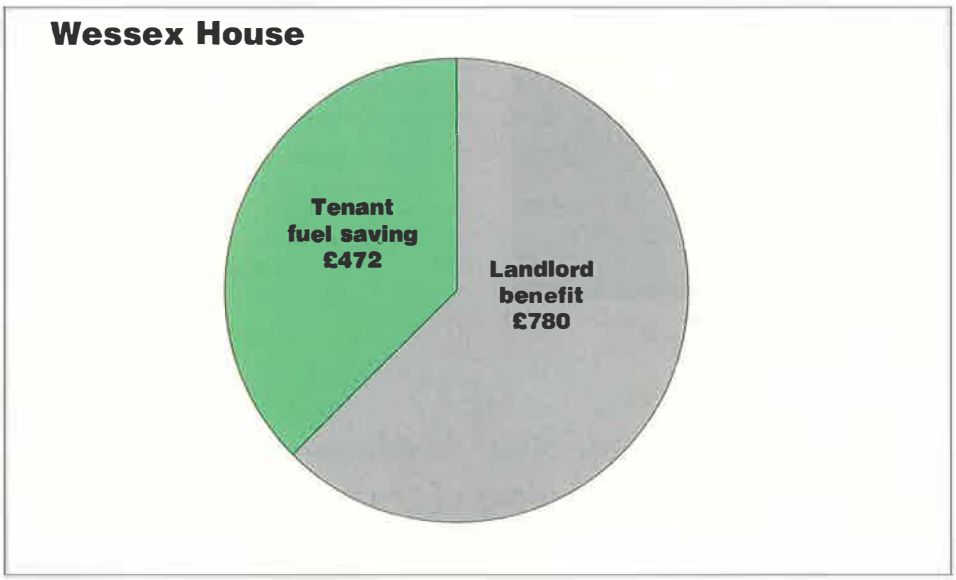
Additionally, the flats benefit from changes to the internal layout, external decoration, replastering and environmental landscaping.

The total cost of the improvements was £44 260 per dwelling at 1991 prices, of which 23%, £10 600, was for energy improvement measures. Data on the number of voids, rent arrears and other indicators were not available for the period prior to refurbishment. Therefore, a block of similar unimproved property, where information could be obtained and used for comparison, was selected.

Barrowhill Crescent

Barrowhill Crescent, built in 1928, is a terrace of 35 3-bedroom terraced houses of solid brick construction. Prior to refurbishment, the houses were cold and difficult to heat with a high incidence of condensation. Council officers have suggested that it was only the severe shortage of housing in the area which kept the properties tenanted.

The improvement works carried out during 1988 were very similar to those carried out at Wessex House, underlining the replication potential of many energy measures across a wide range of property types.



Annual savings per dwelling for tenants and landlord

The energy efficiency measures included external wall insulation, roof insulation, humidistat controlled extract fans, and gas-fired central heating. Improvements were also made to internal layouts, external and internal decoration. New kitchens were fitted, and replastering and environmental landscaping performed.

The total cost of the measures was £25 100 per dwelling at 1991 prices with 20%, £5020, attributable to the energy efficiency measures.

Once again, it was not possible to collect data for the period prior to refurbishment, so it was necessary for comparison to collect data from a group of similar unimproved property.

Energy Benefits

'NHER Evaluator'[1], a computer program which incorporates BRE's Domestic Energy Model, BREDEM, was used to estimate energy costs before and after refurbishment to provide a standard method of comparison. The advantage of using BREDEM is that true comparisons can be made which are not influenced by occupants' differing heating patterns.

The estimates assume that conditions of 21°C in living rooms and 18°C elsewhere in the dwelling are achieved both before and after improvement. In reality, it is likely that before refurbishment, poor insulation and heating provision would have resulted in lower space temperatures than those set, so after refurbishment a proportion of the fuel savings would be taken as increased warmth.

Wessex House's Energy Benefits

The annual fuel cost saving for a typical flat amounted to £472, equating to almost half the total fuel bill for a similar unimproved property. Associated emissions of carbon dioxide (CO_2) were also dramatically reduced by 12.7 tonnes per year, and the National Home Energy Rating (NHER) increased from 1.7 to 7.4. (The NHER

Barrowhill Crescent – Before

Barrowhill Crescent – After

scale is 0 to 10, with a rating of 10 for the most energy efficient dwellings.)

A simple payback period is calculated by dividing the capital cost by the annual fuel cost saving, which in this case provides a payback period on investment of 22 years.

Barrowhill Crescent's Energy Benefits

The annual fuel cost saving for a typical house amounted to £258, reducing the total fuel bill by over one-third and representing a reduction in heating costs of almost 40%. Annual CO_2 production was reduced from 7.6 to 4.5 tonnes, a saving of 3.1 tonnes, and the NHER was increased from 3.8 to 7.7. The simple payback period on investment was calculated to be 20 years.

Landlord Benefits

Many of the areas currently being studied and quantified as landlord benefits have traditionally been ignored as forming part of the landlord's fixed overhead charges.

Current practice dictates that all costs are attributable. With the advent of Compulsory Competitive Tendering for housing management expected in April 1994, any opportunity to identify and minimise costs should be of interest to existing and aspiring landlords.

In the case of Bristol City Council, landlord benefits were obtained in the form of increased rent revenue; a reduction in voids, complaints and transfer requests; and lower total maintenance costs.

Wessex House's Landlord Benefits

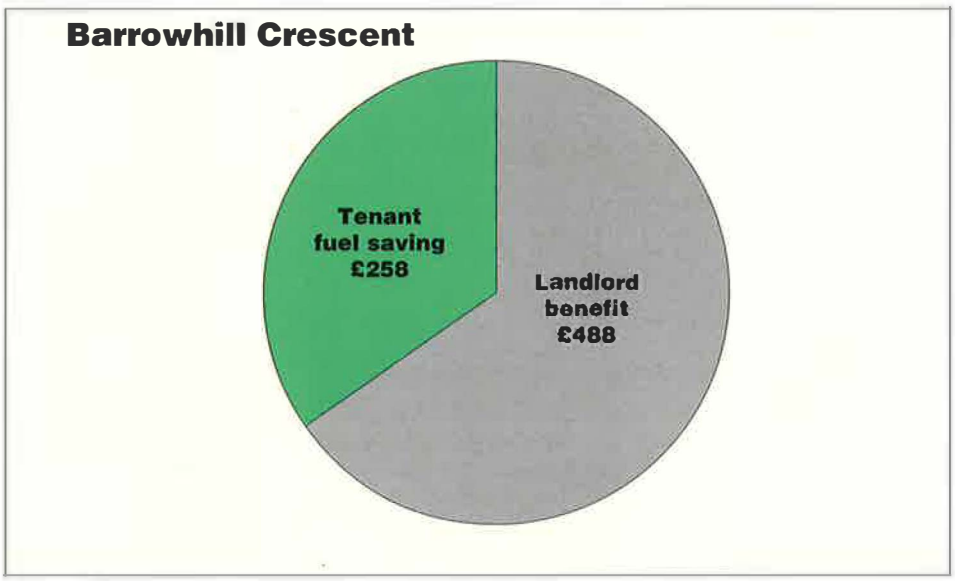
Following the improvement works, weekly rents were increased by £16.55 for each dwelling, representing an annual revenue increase of £861. The rent increase was itemised with £11.17 per week attributed to the energy improvements as follows: central heating £7.36, external wall insulation £0.73, double glazing £2.58 and heat recovery ventilation £0.50.

The incidence of void property disappeared at Wessex House following refurbishment; the control group displayed a void rate of 3.2 properties per year for the same period. Lost rent in the void properties amounted to £1105, repair costs associated with their rehabilitation amounted to £7458 and a saving in staff time was estimated to be £609. The overall cost saving, from reducing the number of voids, was almost £9200 per year.

There were 55 complaints at the control site and only 10 at Wessex House. Staff reported that the total time taken to deal with individual complaints reduced considerably from about 1 hour to 10 minutes. The effective reduction in staff time spent dealing with complaints was over 95%, representing a cost saving of £535 each year. Transfer requests disappeared, providing a staff saving of £184 per year. Total repair costs for the monitoring period reduced from £9423 for the control group to £2378 for Wessex House, providing a 60% cost saving, after correcting, for the different number of dwellings in the two groups.

There were no reports of condensation at Wessex House, compared to three in the control group, which were all dealt with by the installation of humidistat extract fans at a cost of £189 each.

It would be unfair to claim that all of the savings were due to the energy improvement measures as they were installed as part of a wider improvement package. The cost of the energy measures was 23% of the total improvement costs, therefore 23% of the benefits have been attributed to the energy measures.



Annual savings per dwelling for tenants and landlord

Annual Fuel Saving £46M	CO_2 Emissions Savings 70 000 tonnes/yr

Bristol City Council replication potential

In addition to the reduced management and maintenance costs, Bristol City Council estimates that the asset value of a flat in Wessex House increased by £16 694 with 23%, (£3840) attributed to the energy efficiency measures.

Barrowhill Crescent's Landlord Benefits

Following the improvement works, weekly rents were increased by £13.92 per dwelling, representing an annual revenue increase of £724. The rent increase was itemised with £8.54 per week attributed to the energy improvements as follows: central heating £7.81 and external wall insulation £0.73.

The incidence of void property disappeared at Barrowhill Crescent following refurbishment; the control group displayed a void rate of three properties per year for the same period. When adjusted to allow for the different sample sizes, this translates to one dwelling per year providing an annual saving of £178.

The amount of staff time committed to dealing with complaints almost disappeared, with an estimated saving of £358 per year, and savings from reduced repair costs were substantial at over £7000 per year.

Cost-Effectiveness

At Wessex House the simple payback using fuel cost savings alone was calculated to be 22 years whilst the payback using landlord benefits was 14 years. By combining the benefits to both landlord and tenant, providing a full value for money assessment, the payback period reduces to 9 years.

Barrowhill Crescent provides a similar picture. The simple payback based on fuel costs was 20 years whilst the payback using landlord benefits was just over 10 years. By combining the benefits to both landlord and tenant to provide a full value for money assessment, the simple payback period reduces to under 7 years.

In terms of Net Present Value per unit of capital, NPV/K, if a 25 year lifetime is assumed for the measures, NPV/K = 0.5 and 0.9 at Wessex House and Barrowhill Crescent respectively (at a test discount rate of 6%). (K = capital.) Therefore these both represent highly cost-effective investments.

Conclusion

The experience of Bristol City Council demonstrates the cost-effectiveness of energy efficient refurbishment to both the tenant and the landlord. It also underlines the replication potential of many energy efficiency measures across a broad range of property types.

Both studies clearly indicate that any additional cost incurred from including energy measures in a refurbishment project can have significant, beneficial effects on the landlord's management and maintenance costs following improvement. These factors should be taken into consideration when making investment decisions.

If Bristol City Council were to upgrade all of the 37 000 properties under its management to a similar standard, the authority would save £46m annually. Calculations show it would also reduce associated CO_2 emissions by over 70 000 tonnes, after allowing for tenants choosing to take 50% of the energy efficiency benefit as increased warmth.

Reference

[1] NHER Evaluator, National Energy Foundation, Milton Keynes.

All costs quoted are updated to June 1991 levels.

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For buildings-related projects: Enquiries Bureau, BRECSU, Building Research Establishment, Garston, Watford, WD2 7JR. Tel 0923 664258. Fax 0923 664787.

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