21.3.2 Building Fabric

Three standards of construction were considered for the purposes of energy modellina

1) The first is the buildings as they are at present, which forms the reference case. In this case the dwelling was assumed to have no insulation, and to use the existing heating system. In the case of dwellings using electric heating it was assumed that they had old style storage heaters. The windows are single glazed

The unit modelled was a two bedroom mid floor flat which is a typical dwelling at Ballymun as existing.

2) The second case is building to current Irish Building Regulations (0.45 W/m2K for the walls and 0.35 W/m2K for the roof and 0.45 W/m2K for the floor) and with the hot water tank having 25mm of insulation. In the case of gas fired heating systems, standard boilers are assumed. The windows are double glazed.

The unit modelled was a two bedroom mid terrace house which is a typical dwelling in the proposed scheme.

3) In the third case the building is to a higher standard with a fabric U-Value of 0.3 W/m2K for the walls and 0.2 W/m2K for the roof and 0.3 W/m2K for the floor with more than 50mm of insulation on the tank. In the case of gas fired heating systems, condensing boilers are assumed. The windows double glazed with a low emissivity coating.

The unit modelled was a two bedroom house as in case 2.

In order to represent the actual situation as realistically as possible it was assumed that there is extended occupancy of 16 hours at 21°C in all cases.

COMPARATIVE COSTS OF THE SYSTEMS 21.4

21.4.1 Results

Estimates of energy use were made using National Home Energy Rating (NHER) software for the three standards as described above.

The results of this analysis were then fed into a spreadsheet to calculate the costs of supplying heat for space heating and hot water per year and compare the estimated maintenance costs and the capital overcosts.

The following capital overcosts are defined as the extra costs over and above installing a standard system (ie a central heating system with a standard boiler). The items considered as a capital cost are considered to have a lifetime of 20 years and therefore the costs are spread over 20 years. This study is intended as a guide only and no account is taken of interest rates or discount rates over the twenty year period

The following graphs compare the costs associated with providing heating and hot water to the units per year for each of the various heating systems



Figure 1 - As existing Comparison of costs for two bed mid floor flat

Figure 2 - To building regulations Comparison of costs for two bed mid terrace house



Figure 3 - To higher insulation standards Comparison of costs for 2 bed mid terrace house



21.4.2 Discussion

Costs to the tenants

These graphs shows that the main cost at present is the cost of the gas due to the poor insulation standards and inefficiencies of the system. As the insulation standards are improved the unit cost of the gas becomes less significant and the standing charges for gas on the standard tariff become more significant.

The cheapest overall option for both the houses built to building regulations and to higher standards is the individual gas boilers using the pre-payment tariff.

The present actual cost for heating and hot water for a two bedroom flat is £275 per year. This compares to the figure of £180 predicted by the NHER program. The discrepancy between the predicted figure and the actual is most likely due to a lack of control and the occupants having to open windows to control the temperature in the flats, which is not accounted for in the model. The predictions for the new build housing are likely to be more accurate as the tenants will have greater control over the heating.

One of the main concerns of the tenants at Ballymun is that their fuel bills will be higher following the redevelopment. It is therefore essential that the option for the heating system which is chosen costs approximately the same per year or ideally less than the existing system. The only option which is less than the figure of £275 (if the figure for maintenance is taken into account) is the individual gas boiler using the card payment scheme.

The tenants have also expressed a preference for paying for their energy using a pre payment scheme as this allows them to budget for their needs without getting into debt. The utility company also prefers to use this scheme in areas where people have difficulty paying their bills.

Costs to Dublin Corporation Figures 2 to 3 show that the cheapest options for Dublin Corporation are the individual gas boilers. The costs of the district heating scheme are dominated by the costs of maintenance and the costs of both extending the ring main and the cost of the heat meter (around £1150).

Contracting an ESCOs (see section 21.6.2) to provide the heat would produce an annual bill reasonably close to the figure of £275, however the cost of extending the ring main makes this a less attractive option for Dublin Corporation

Subsidy

There is a fuel subsidy of £3 per week (for any fuel) available for people receiving unemployment/disability benefit for more than 13 weeks. This is available from mid October to Mid April. Over one heating period (25 weeks) this would amount to £75.

For people receiving benefit for more than 15 months for unemployment, lone parenting or disability there is a fuel allowance of £8 per week over the same period as above. Over one heating period as above this would amount to £200.

21.4.3 Relative significance of the energy efficient features

annual running costs

- 3. Increasing the U-value of the walls from 0.45 W/m2/K to 0.3 W/m2/K (approximately 100mm of insulation compared to 80mm)
- (approximately 80mm of insulation compared to 50mm)

This shows that the package of insulation measures saves 17% energy, the low emissivity glass saves 4% and the condensing boiler saves 15%.

It is recommended that all these features are adopted in order to ensure that the annual running costs to the tenants are less than they are at present. An estimate of the total cost of these features is £900. This gives a payback for all these features of just over 10 years.

Figure 4 - Effects of the including energy efficient features on annual costs in a 2 bedroom house using gas fired individual boilers



Figure 4 shows the relative effects of the following energy efficient features on the

- 1. Increasing the insulation on the hot water tank from 25mm to 50mm
- 2. Increasing the U-value of the roof from 0.35 W/m2/K to 0.2 W/m2/K
 - (approximately 150mm of mineral fibre insulation compared to 80mm)
- 4. Increasing the U-value of the floor from 0.45 W/m2/K to 0.3 W/m2/K
- 5. Specifying low emissivity glass in place of clear float
- 6. Specifying a condensing boiler in place of a conventional boiler

The Masterplan attempts to be a flexible

This section explores ways in which energy can be saved.

> Environment õ Energy



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