



### General information

<b>Building owner</b>	Dublin City Council
<b>Address</b>	Ballybough
<b>Total heated floor area</b>	1581.58m <sup>2</sup>
<b>Year of construction</b>	1964
<b>Year of refurbishment</b>	2003

### Initial situation



The building was almost 40 years old and the fabric of the building had deteriorated in particular the windows, roof and concrete works. The block of flats had minimal insulation and therefore problems with dampness and condensation was common. Codema secured funding for the refurbishment of Ballybough flats from the national Energy Agency, Sustainable Energy Ireland, through the House of Tomorrow Research, Development, & demonstration Programme under the Economic & Social Infrastructure Operational Programme of the National Development Plan (2000 – 2006).

### Innovative financing model

The refurbishment of Ballybough was funded by the Department of Environment & Local Government with additional funding from the House of Tomorrow Programme.

The principle objective of the House of Tomorrow Programme to generate results from funded projects, which can lead to more sustainable energy practices in Irish Housing, both new build and existing stock. This includes contributing to workable, least cost solutions which can improve energy performance and reduce environmental emissions from Irish housing to help meet the technologies, products, processes, practices and policies aimed at impacting the housing market.

The programme budget is €21.1M over the period 2001-2006, with a total budget for the upgrade of existing homes of €2.5M and total available support of €5,000/unit or 50% of the additional costs for energy features and aspects.

The requirements of the project are summarised here:

- 40% reduction of energy and CO<sub>2</sub> emissions relative to minimum compliance with Building Regulations 2002
  - Planning & design features to include integrated site planning, energy source, landscaping & shelter, built form, design & orientation
  - Energy technology specification to include fabric elements, ventilation & air quality control, heat generation source, heating distribution & controls, sanitary water & waste facilities, building materials & electrical appliances.
- Monitoring, reporting & dissemination:

### Contact

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## Good practice: financing example "Ballybough"

### Energy related activities

#### Building shape

A new insulated pitched roof was added over existing uninsulated roof  
Insulation of attic (U-value from 1.94 to 0.16W/m<sup>2</sup>K)  
Replacement of windows (U-values from 5.0 to 2.4 W/m<sup>2</sup>K)

#### Other activities

Wall insulation: a third outer leaf was added with 60mm insulation improving U-value from 1.9 to 0.27 W/m<sup>2</sup>K  
Highly efficient (79%) gas boiler & insulation of pipe work & storage tanks  
CFC & HCFC free materials, low energy lighting

#### Solar system

N/A

### Energy related indicators

	Initial situation	After refurbishment	Reduction
Energy performance	984kWh/m <sup>2</sup> a	191 kWh/m <sup>2</sup> a	80%
Energy consumption	1556274kWh/a	302,081 kWh/a	81%
CO <sub>2</sub> - emission	345.3Kg/m <sup>2</sup> /a	36.9Kg/m <sup>2</sup> /a	89%
Heating system	Open fire (solid fuel)	Gas fired central heating	
DHW - system	Individual systems	Individual systems	
Monitoring system	No monitoring - energy costs based on 161 no. of 40 Kilo bags of coal to adequately heat entire flats - theoretical rather than actual figures	1 Year metre reading collection as required by grant  Temperature & RH logging of subset of flats as required by grant	

### Financial indicators

#### Energy costs

	Initial situation	After refurbishment	Reduction
Energy costs	€40.65/m <sup>2</sup> /a	€10.79/m <sup>2</sup> /a	74%

#### Investment costs of the total refurbishment

€ 115,000

#### Investment costs of the energy related refurbishment

€ 21,241

#### Costs per saved kWh

### Report of the investment costs

The refurbishment costs are not passed on to the tenant. Tenants pay rent in accordance with their income and irrespective of the condition or size of their accommodation. The main reason for this is to help alleviate the problem of fuel poverty.

The Department of the Environment scrutinises in detail all applications for funding of social housing in terms of value for money and good payback.

### Statement

**Kieran Gallagher, Deputy City Architect, Dublin City Council**



The overall objective of Dublin City Councils refurbishment programme was to demonstrate a high standard of energy-efficiency in refurbished social housing apartments within an overall integrated area plan for social, economic & environmental regeneration of the inner city. Energy Refurbishment was considered in terms of reduction of greenhouse gases, combating fuel poverty and preservation of housing stock. Codema secured a grant of €500,000 for the energy efficient refurbishment of 100 Dublin City social housing flats in 2003, which facilitated higher specifications for fabric insulation, high performing windows and the installation of an efficient heating system

The production of this good practice example is supported by

**Intelligent Energy** Europe

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