



Case Study 24



Solid Fuel Cooker

In Tipperary, Ireland, many of the social houses constructed have solid fuel ranges installed as the main heating system. These are cookers which typically have a back boiler to supply the hot water for central heating through radiators throughout the house.

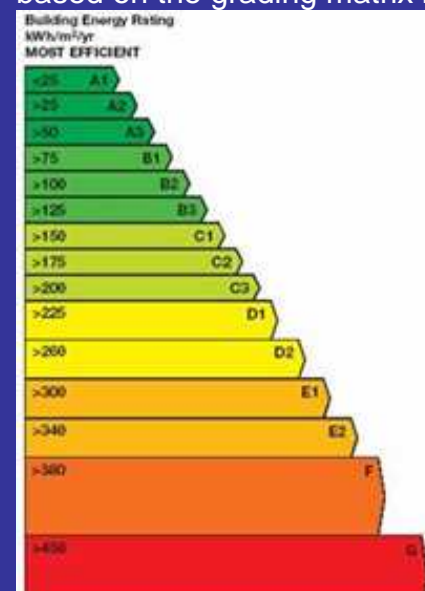
Solid fuel is generally used as other fuels such as natural gas have limited availability in Tipperary. Tenants tend to find it easier to manage the budgeting for solid fuel, which can be bought on a weekly basis. Also as Tipperary is a very rural county tenants are often able to use local supplies of turf and wood at relatively cheap prices, to supplement the use of coal.

However, solid fuel cookers have relatively low efficiencies, losing up to 50% of their potential heat energy. They require daily cleaning for ash removal and regular maintenance and are difficult to control. Also the quality of the fuel purchased can be an issue with turf and wood having a higher moisture content and not burning cleanly.

Impact of Solid Fuel Heating in Social Housing

Building Energy Rating

The Building Energy Rating (BER) has been developed in Ireland to measure and rate the energy consumption in buildings as required under the European Performance Building Directive. This standardised calculation of the energy performance of a building and takes into account insulation, ventilation, heating, hot water and electric lighting and then gets a rating based on the grading matrix below.



SHARE is an Intelligent Energy Europe Project working in Eight European areas to develop energy efficiency and low carbon technologies in social housing. For more information about the SHARE project and for other case studies see the project website:



An analysis was carried out by North Tipperary County Council and Tipperary Energy Agency to look at the impact of solid fuel cookers in social Houses. The new Building Energy Rating (BER) methodology was used to calculate their impact. The table below shows the results for typical heating and hot water systems in current houses.

Heating System	BER	Energy Value (kWh/m ² /yr)	CDER (kgCO ₂ /m ² /yr)
Solid fuel range, open fire in living room, electric immersion water heater.	E1	303.65	97.44

As can be seen the BER for the house is low despite the fact that it meets current building regulations for insulation and glazing. This is mainly due to the poor efficiency of the solid fuel range and that it cannot be well controlled. In addition, the open solid fuel fire has a very low efficiency. This means that more fuel will have to be consumed to maintain comfort and as a result energy consumption and CO₂ emissions are high.



An analysis was then carried out on the same house but with an efficient oil condensing boiler and a closed stove instead of an open fire in the living room.

Heating System	BER	Energy Value (kWh/m ² /yr)	CDER (kgCO ₂ /m ² /yr)
Condensing Oil Boiler Closed Stove in Living Room Electric Immersion	B3	143.28	35.96

The BER increased significantly. The same comfort levels can be achieved in the house with a 50% reduction in energy consumption and two thirds saving in CO₂ emissions. A further analysis was then carried out with a solar water heating system instead of an electric immersion for hot water.

Heating System	BER	Energy Value (kWh/m ² /yr)	CDER (kgCO ₂ /m ² /yr)
Condensing Oil Boiler Closed Stove in Living Room Solar Water Heating	B2	117.70	29.85

Energy consumption was further reduced by almost 20%.

This example shows the importance of using efficient solutions for heating and hot water to reduce energy consumption and energy costs

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