

## Real Life Case Study

### Energy Efficient Renovation includes Wood Burning Stove

Key Points brought out in the case study:

- Recorded reduction in gas usage.
- Temperature increase in living room.
- More efficient use of heat in living area.
- Heat transferred to other rooms.
- Enhances family lifestyle.



## Energy Efficient Renovation includes Wood Burning Stove

### Cost effective

The house is a traditional Malvern Stone detached Gentleman's Residence built in 1880. The original Victorian part of the building has two feet thick solid walls, which effectively regulate the heat in the house in summer and winter. The extension now has super insulated cavity walls and 200mm deep insulation on the inside face of the walls. Attic spaces have been triple insulated and windows are double glazed. The aim is to have a house that has an energy rating of at least C.

The motivation behind the renovation was simple. The family decided that they could not afford the gas bill to heat the house at the desired level.

### Recorded reduction in gas usage

The main form of heating in the house was gas. A new 92% efficient condensing boiler was installed Feb 2011. Prior to installing the stove the average daily winter gas usage was 18.66kw. A 74% multi fuel stove was installed in November, 2013. As the living room had an open fire, the family decided to replace it with a multi fuel stove because this meant that they could continue to burn the same fuel used in the open fire. When they learnt about the environmental benefits of wood they choose to switch to burning wood.

### More efficient use of heat in the living area

Since installing the stove gas usage has dropped to 13.8kw. Factoring out the gas used for water heating this represents a 35% drop in space heating gas usage. This winter was warmer than last, but even with that taken into account the drop in gas usage is still significant. The average temperature in the winter months of 2014 was 3 degrees higher than 2013.

Simon took advantage of the discounted summer prices for kiln dried wood and purchased eight 1.2 cubic meter bags. In the time since the stove was installed up to the end of February six bags have been used, costing £562.

### Temperature increase in living room

The most noticeable benefit of the wood burning stove has been the increase in temperature in the main living rooms. Since the stove was installed the thermostatically controlled radiators have only been used on cold mornings before the stove is lit.

The thermostats on the radiators in other rooms have been turned down to 16°C when "on" in the evenings. The rest of the house does not need the radiators to come on when the stove is lit, unless it gets really cold. The temperature loggers show that the temperature in the downstairs living area has gone from an average 16°C to a much more cosy 22°C. To achieve this temperature using the gas boiler would have significantly increased the gas usage. Although the efficiency of the wood burning stove is lower than that of the condensing gas boiler, the energy is used more effectively. It is now concentrated in the main living room of the house, where the family likes to spend most of their time together. Simon likes to sit a little further from the stove than his wife. She enjoys the direct heat from the fire. In this way, the heat from the stove suits both their heat preferences.

### Enhances family lifestyle

The plan is to install a second stove in other end of the house, along with a remote boiler thermostat. The family think that the warm air from both stoves will then permeate throughout the upstairs of the house, reducing further the need to activate the central heating.