



CARE HOMES - Warrens Hall, Tividale

The two water heater boilers at Warrens Hall had Magnatech units installed on August 4 2015.

When comparing the **total gas consumption on the whole site** compared to the same period the previous year there is a **reduction of 11%** in consumption using Heating Degree Days for the period from August 4th to Nov 7th.

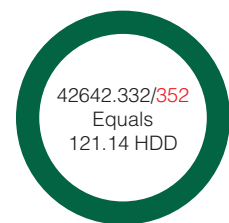
The kitchen and laundry also use gas but their gas burning appliances did not have Magnatech units fitted to them.

The consumption in 2014 from Aug 4th to Nov 7th was 42,642.332 kWh

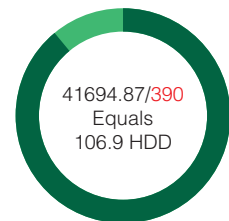
The consumption for the same period in 2015 was 41,694.87 kWh, nearly 1000 kWh less.

By using degree days the to take into account any variables created by the outside temperature the reduction in consumption from 2014 to 2015 is 11%.

2014 Consumption Aug 4th to Nov 4th



2015 Consumption Aug 4th to Nov 4th



As a Percentage
 $121.14 - 106.9 = 14.24$
 $14.24/121.14 \times 100 = \mathbf{11.00\%}$
reduction in fuel consumption

Gas and water meters were placed on the water heaters for a month before the installation of magnatech units.

Prior to installation - 719m³ of gas to 67m³ of water over 33 days = 10.4

Post installation - 2139m³ of gas to 175m³ of water over 96 days = 12.5

However, when the outside temperature is taken into account there were 48 degree days in the pre installation period and 109 degree days in the post installation period. The outside temperature does affect the volume of fuel consumed even when heating water because of a number of factors such as raising the water temperature further, heat loss etc etc. The figures used come from Birmingham Airport and found on www.degree-days.net

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Post removal of Magnatech units on 24th November 2015

The units were removed on 24th November with the aim of collecting more data to compare the effect of the Magnatech Units. One important factor to bear in mind is that the water heaters would have had performance and heat transfer abilities improved because of the higher flame temperature cleaning the burner heads and therefore a direct comparison is difficult.

The figures below represent the total time with Magnatech Units on and the total time (to date - 8/12/2015) with the units off. 48 days of data without Magnatech and 96 days of data with Magnatech units. The degree day analysis gives the volume of fuel used for each heating degree day and so compares the consumption on a par - regardless of the outside temperature.

Degree Days Without Magnatech Units	Fuel Burnt	Volume of Fuel/ by Degree Days
181.6	1016m ³	5.59HDD
Degree Days With Magnatech Units	Fuel Burnt	Volume of Fuel/ by Degree Days
588.9	2542m ³	4.31HDD

This represents a reduction in fuel consumption of 22% (when using degree day data based on 17.5c at Birmingham Airport from www.degreedays.net) $[5.59 - 4.31 = 1.28]$ then $[1.28/5.59 \times 100 = 22.89\%]$

Regarding water consumption to fuel consumption, the comparison is not a straightforward one as it might first appear. There are a number of complex factors to consider outside of a laboratory situation, such as the length of time a tap is run, so allowing the pipe to become hot and the water to lose less temperature through radiated heat, as it passes along the pipe. If a tap is used for a short time and then left for the water to cool, then turned on again, the cooled water throughout the length of the pipe will be run off before the desired temperature is flowing out of the tap.

The heat loss through the pipes will vary as well depending on insulation or if they run underground. The volume of water will alter according to a number of factors from human to temperature.

In summary there is a total reduction of gas consumption shown for the whole site of 11% compared to the same period the previous year. Specifically a 22% reduction of fuel consumption for the water heaters when compared to the time when magnets were on the fuel lines to when they were off the fuel lines.