



TESTING PROTOCOLS FOR HOME STUDIES

Strict protocols are essential when testing energy efficiency in homes for accurate measurement, reliable results, and standardised assessment. They ensure consistent methodologies, reducing errors and discrepancies, and provide reliable data for comparisons. Standardised protocols facilitate benchmarking and foster innovation, as fair testing promotes competition and advancements in energy-efficient technologies. Moreover, protocols instill trust in the sector, driving market demand and supporting sustainable practices.

The protocol below, developed by Magnatech Technology Ltd, ensures accurate measurement of relevant factors and ensures consistent results when assessing the post-installation effectiveness of the BoostaBoiler Fuel Efficiency System in the home environment.

Introduction

In recent years, a number of academic research teams across the world have studied the effects of using very strong magnets on hydrocarbon fuel feed-pipes and have published their findings. They have discovered several key benefits, which apply to all hydrocarbon fuels.

The magnetic field weakens the bond between fuel molecules and aligns them, leading to more efficient combustion. This results in a hotter flame, producing more heat with less fuel and reducing harmful emissions.

Testing objectives

The objective of the trial is to collect energy usage data for the chosen dwelling/s from a year prior to the installation of the BoostaBoiler device. The aim being to compare two sets of like-for-like data from corresponding utility bills, one year apart. One set prior to installation and the other set post installation of the BoostaBoiler device. This is in line with the methods recommended by the IMPVP [*Concepts and Options for Determining Energy and Water Savings Volume I*]. The goal being that by analysing the findings using Degree Day Data, a measured saving in domestic heating costs and hydrocarbon fuel use will be established.

Variables


Annual domestic energy demand (kWh/year) for heating and hot water by property type and age.

Age band	Flat	Terrace	Semi-detached	Detached
Pre 1917	10,581	16,042	20,476	30,714
1918 – 1938	9,755	14,640	18,652	27,977
1939 – 1959	8,994	13,182	16,688	25,033
1960 – 1975	8,653	12,710	16,065	24,098
1976 – 1982	8,101	11,740	14,749	22,123
1983 – 1989	8,331	11,989	15,072	22,608
1990 – 1999	6,828	9,479	11,728	17,592
Post 2000	6,218	8,371	10,306	15,459


Source: DECC Impact Assessment on the metering requirements for heating, cooling and hot water networks
<https://www.gov.uk/government/consultations/implementing-the-energy-efficiency-directive-metering-and-billing-of-heating-and-cooling>

Variables


Because of the differences in fuel/heating requirements in residential dwellings (see table above), there are many factors that can be standardised in order to achieve consistent results during the trial:




Heating
Thermostat constant set at 18.5 Degrees




Windows
All closed




Doors
Time of opening for entering / leaving and deliveries recorded and kept constant to baseline recording - 20 seconds twice a day




Showers
Heat set at exact same temperature and length of showers recorded and kept to 5 minutes exactly (recorded by stop watch)




Visitors
No visitors stayed during the baseline or boostaboiler test




Kettles
Filled from cold tap only




Washing
Exact same settings used and exact number of washes carried out each week (2)




Occupancy
2 people for baseline and Boostaboiler test




Hand Washing
Timed to 30 seconds and allowed for 4 times a day - after meal prep and after lunch, dinner and 1 ad hoc



Degree Days
Ambient temperature records obtained from www.degreedays.net from nearest weather station - EGHH: Bournemouth Airport (1.84W, 50.78N)



Recordings of Usage
Taken from Smart meter EDF Energy Hub



Insulation
No changes to insulation (pipes, loft, cavity wall etc.) from the period of pre-installation measurements to the conclusion of the trial.

Test procedures

When people invest in energy efficiency, whether in an industrial or domestic setting, they will want to know how much they are saving and how long those savings will last. To ensure the credibility and consistency of energy-saving claims, accurate measurement and a replicable methodology are essential. We achieve this through the use of a measurement and verification (M&V) protocol.

Following an initial assessment of the property to ensure the requirements for the variables are met, the previous years gas/oil bills are requested in order to begin the measurement and verification process.

Our measurement and verification protocol is a systematic and standardised approach used to assess and quantify the actual energy savings resulting from the installation of our BoostaBoiler unit. It involves a series of steps and guidelines to measure the baseline energy consumption (pre-implementation) and compare it to the post-implementation energy consumption.

Here are the key components of our M&V protocol:


1. **Baseline Measurement:** This step involves gathering data on energy consumption before BoostaBoiler is installed. It establishes a benchmark against which post-implementation energy consumption will be compared.
2. **Post-Implementation Measurement:** After BoostaBoiler has been installed, data on energy consumption is collected again to assess the actual impact of the installation.
3. **Adjustments and Corrections:** Quite often, fluctuations in weather conditions can influence energy consumption. Our M&V protocol includes the inclusion of Degree Day Data to adjust for this in order to get a more accurate picture of energy savings attributable to BoostaBoiler.
4. **Calibration and Verification of Measurement Instruments:** Ensuring that any instruments used for measurement are accurate and calibrated properly is vital to obtain reliable data.
5. **Replicability:** Our protocol is completely replicable, it can be applied consistently across different sites or residences to achieve reliable results.
6. **Documentation and Reporting:** We produce detailed documentation of the entire M&V process. This is crucial for transparency and credibility. The results and methodologies used are well-documented and reported to customers.

By following our standardised M&V protocol, homeowners, businesses and regulatory bodies can have confidence in the reported energy savings. Our CEO Simon Goodchild is personally certified by the EMA (Energy Managers Association) in energy monitoring and validation, he believes this is essential for making informed decisions about future energy efficiency measures and programs.

Previous Trials

Magnatech Technology Ltd have trialled their product with many blue chip companies, manufacturers, hotels and housing associations. The results are impressive, with savings ranging between 6% - 15%, and although some are reluctant to publish their results, most are prepared to offer an endorsement of the product and the savings they are now enjoying.

Below is an example of our standard savings report, we generate these for customers that trial our product to illustrate the savings that our technology has achieved for them.




Customer Name: SPM Management (on behalf of Magnatech USA LLC)
Todays Date: 22/06/22
Dates of Trial: 02/01/21 - 06/01/22


With Magnatech (A)		Without Magnatech (B)	
Feb - Mar	2871	Feb - Mar	3486
Mar - Apr	2181	Mar - Apr	2252
Apr - May	1261	Apr - May	1110
May - Jun	646	May - Jun	561
Total kWh	6959	Total kWh	7409

Degree Days Explained

Degree days are calculated by comparing the average temperature in a location to a baseline temperature, which is typically around 65 degrees Fahrenheit. If the average temperature is higher than the baseline temperature, the degree days are "cooling degree days," which means that energy will be needed to cool the building. If the average temperature is lower than the baseline temperature, the degree days are "heating degree days," which means that energy will be needed to heat the building.

Total Consumption A	Total Consumption B	Weather Station Data KEWR_HDD_65°F (1)	
A = 17988.00	B = 19637.00	Description:	Celsius-based heating degree days with a base temperature of 65°F
Using degree days figures from 'closest weather station' set at 65°F. (www.Degreedays.net)		Source:	www.degreedays.net
Total Degree Days in Period A	Total Degree Days in Period B	Accuracy:	No problems detected
Period A = 849.63	Period B = 836.6	Station:	Newark, NJ, US (74.17W,40.69N)
Dividing total consumption by degree days = fuel burnt per degree day.		Station ID:	KEWR
Period A = 21.1715688	Period B = 23.47238824	Month Starting:	HDD 65°F
Reduction of consumption per HDD		02-01-2021	415.5
HDD Reduction = -2.300819438		03-01-2021	257.7
Reduction in Period A divided by Consumption in Period B		04-01-2021	121.5
*100 Gives you a percentage reduction figure:		05-01-2021	41.9
Percentage Reduction = 9.8%		02-01-2022	370.70
This proves a considerable reduction in fuel consumption over the comparable heating periods after the Magnatech units were installed.		03-01-2022	282.3
		04-01-2022	154.73
		05-01-2022	41.81
		TOTAL	836.6
		TOTAL	849.63





Gable House, Regents Park Road, London, United Kingdom

info@magnatechsaveenergy.com

www.magnatechsaveenergy.com

Endorsements

Below are a selection of endorsements received from satisfied customers.



“ The Guinness Partnership supports the installation of a FurnaceBooster system from Magnatech Technology Limited.

From our findings, when a FurnaceBooster is installed in our customers' homes it reduced the fuel consumption of the furnaces by at least 8%. We understand this will carry on for life.

This lowered the homes energy costs and also reduced carbon emissions through less fuel being used. **”**

Mark Moore
(Head of Heating and Hot Water Services)



“ We, at Sure Maintenance, are extremely proud to be working with Magnatech Technology Ltd and installing their FurnaceBooster system in our clients homes.

It's a great product, completely Fit & Forget, and with no moving parts and no requirement for external power of any kind, it's a perfect solution in this time of ever increasing gas and oil prices” **”**

Pat Coleman
(Managing Director)



“ We have been extremely impressed with the results from the Magnatech Fuel Efficiency system.

Since installation in November 2022 in our buildings at 766 Shrewsbury Avenue, Tinton Falls NJ, our usage has dropped considerably and despite the rise in gas prices, we are paying approximately 15% less than the same period last year. The savings are calculated using degree days data that compensates for the warmer winter.

We would encourage all businesses and homeowners who use gas, oil, LPG, or propane to heat their properties and to provide hot water to purchase the Magnatech / FurnaceBooster system. **”**

We estimate our return on the investment in the system will be paid back within nine months, which is incredible.

Abe Cohen
(Partner)

“ JKP “Toplifikacija” appreciate and highly recommend the Magnatech™ system for saving natural gas.

We are very satisfied with the savings we achieved. We will install The Magnatech Technology solution in our other boiler houses as well. **”**

Milan Laketic
(Head of Maintenance & Production Department)



JAVNO KOMUNALNO PREDUZEĆE
JKP “Toplifikacija”
28. 01. 2023
Директор
Славко Сладојевић



“ At SPM Management, we have a wide array of different properties, and we are always looking for ways to reduce our yearly gas usage. We met with Magnatech USA LLC and after seeing the test data from the UK, Australia and China and reading through the White Papers which explained the scientific principles involved, we decided to install the system in two of our buildings in New Jersey.

...The savings on consumption have been impressive at 9.8%, which we fully understand will continue for life, as FurnaceBooster only loses 1% of its power every 100 years.

Our return on investment has been easily achieved within our budget.

Needless to say, we are extremely pleased with this product and would highly recommend it. **”**

Stephen Steiner
(CEO SPM Management)



THE VERANDA
ASSISTED LIVING

“ We have been in contact with Magnatech USA LLC (MUSA) since the fall of 2022, and were impressed by savings results provided by the Magnatech Fuel Efficiency System on boilers similar to our own.

On contact MUSA offered us a free of charge survey, and once completed they provided us with a quote and a savings and payback estimate. The payback was quoted as being within a year, which we were initially skeptical about as this is much faster than many other energy saving innovations in the market today.

We agreed to a 3 month trial to test the system which ended on Feb 28th. We provided all of our energy bills and also carried out our own calculations using Heating Degree Day data, so we can accurately see Weather Normalized Site Energy consumption, and we were very impressed with the results seen over our highest consumption quarter. A substantial saving has been achieved.

We're working with MUSA now to look at further surveys and installs in our other buildings and would recommend that any business concerned over its heating and hot water cost get in touch with MUSA and ask for a survey. **”**

Regards
Abe Rosenberg

