TRITECH Environmental Technology Verification

Project Results

A Europe-wide pilot project has demonstrated the value of technology verification as a tool to support Eco-Innovation.

It is well established that technology verification schemes can support the acceptance of novel environmental technologies. This is of particular importance to SMEs, who face many barriers in launching new technologies to market. Verification schemes give independent and credible confirmation of the technology vendor's claims, accelerating acceptance and take up by investors and end users from both the public and private sector.

Environmental Technology Verification (ETV) schemes already exist in a number of countries including the USA, Canada, South Korea and Japan. A European scheme is currently under development and the 'TRITECH ETV' Project has delivered a series of recommendations that will influence the structure of a European scheme. The recommendations have been developed following a three year pilot project testing potential mechanisms for a European ETV scheme and actual engagement with 15 companies as 'test cases' for the verification process.

The TRITECH ETV project was developed and managed by Beta Technology Ltd in the UK, a private sector consultancy with a long standing track record in supporting eco-innovation and transnational project management. The project was successfully implemented in partnership with environmental technology experts from Sweden (IVL) and Finland (VTT), and a UK Regional Development Agency (One NorthEast). The project was part-financed by the European Commission LIFE Programme.

The main components of the TRITECH Project were:

- Setting up a stakeholder group
- Development of the Pilot ETV scheme mechanisms
- Establishing a network of testing centres
- Testing and Validation
- Project evaluation
- Dissemination
- Management and Reporting to the European Commission (EC)

The project generated significant advances in ETV in Europe by:

- Increasing public knowledge and awareness of the scheme
- Strengthening links between the European and Canadian ETV schemes
- Increasing potential investors knowledge and understanding of the scheme and it's benefits
- Raising the importance of the scheme with key policy making bodies in the UK and Central Europe
- Producing 15 case study examples of technologies that have been through the verification process

Project Methodology

The pilot project developed and tested verification protocols in three technology areas: waste water treatment, soil remediation and energy.

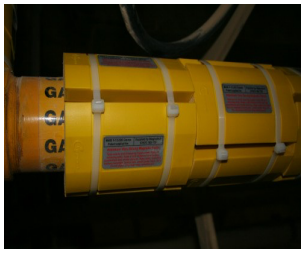
The results of the test case verifications have been shared and compared with other European ETV schemes and used to develop a series of recommendations. The final stages of the project included wider dissemination and engagement with key international stakeholders in ETV schemes including representatives of the ETV International Working Group.

The project methodology was developed to enable the distinct phases on an ETV scheme to be developed and tested in each of the technology areas. The proposed delivery mechanism was based on a best practice review of existing ETV schemes from around the world.

Each technology area was designated a technical coordinator within the consortium (IVL, VTT and One NorthEast), who were responsible for overseeing and developing the test protocols required for the ETV process.

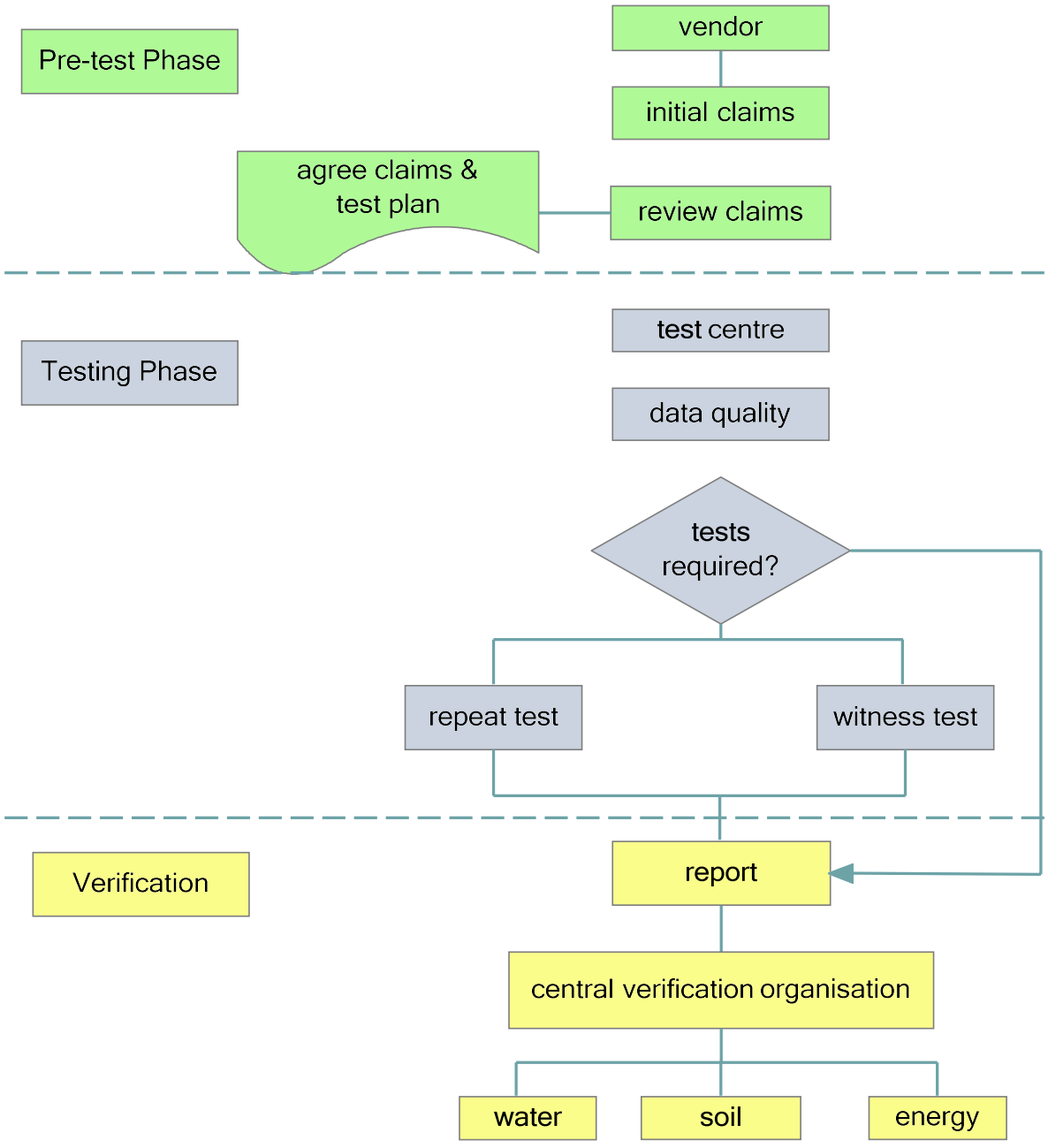
Atrex Dispersion Unit - Waste Water Treatment Technology

Safer Soil Tester – Soil Remediation Technology



Magnatech Fuel Conditioning System - Energy Technology

The diagram below details the verification process developed and tested within the TRITECH project.



Results and Conclusions

The project has not only developed a potential delivery mechanism for a European scheme, but has also developed the operational manuals for each technology area and a competence profile for test centres. 15 technologies have been successfully verified and evidence of how this is helping the individual technology developers to access new markets and promote themselves is being gathered.

From the work undertaken during the three year project and findings from other EU related ETV research projects, the following recommendations have been made to the EC:

- Verify products not technologies
- Make the EU ETV scheme voluntary
- Undertake a legislative process to ensure Europe wide acceptance of the scheme
- Combine verification with demonstration where possible to make the process more cost effective and efficient
- Establish national contact points to avoid language and access barriers in the EU ETV scheme
- Develop a clear, well recognized and credible ETV logo
- Work towards global acceptance of the EU ETV scheme so that “verify once, accepted everywhere” becomes real

Case Study

Magnatech developed a novel magnetic fuel conditioning unit and achieved a successful verification through the TRITECH ETV project.

“We will be adopting the ETV logo in our company information. This will enhance our "brand" and set us apart from competitors. As a technology that is "off the wall" and not a well know solution to energy reduction any external endorsement from an independent source is extremely valuable. Most of orders to date have come from advertising in specialist publications and more importantly from referrals from those who have tried and found success with our technology.

Interest from users who do not have the ability to carefully monitor their fuel usage will hopefully be more confident in ordering Magnatech units. We would anticipate that entry into

EU markets would be eased by having verification from TRITECH and are looking forward to actively marketing in Ireland, initially" Ian Gander http://www.magnatechsavesenergy.com

Potential Environmental Impacts of the project

As the ETV models developed involve a mini life-cycle assessment, environmental benefits will be realised through the greater market uptake of more environmentally responsible technologies. This will directly result in reduced emissions, energy consumption, transport and resource usage, together with increased re-use and recycling rates. All of these will help Europe to reduce its contributions to Climate Change and help it achieve its 2020 commitment to reduce reliance on fossil fuels by increasing the use of renewable energy sources to 15%. The list below covers the main potential environmental benefits resulting from a European ETV scheme:

- Accelerated market uptake of environmental technologies
- An enabler for other energy related activities
- Increased awareness of environmental issues and technologies available to bring about change
- Will help to address / meet CRC (carbon reduction commitment)
- Direct reduction in energy consumption
- Reduced carbon emissions
- Lower carbon footprints
- A reduction in both operational and capital expenditure
- Will boost "green profile"
- Good marketing tool
- Reduced risk at procurement

Project Dissemination

The project was concluded with an event held in central London during August 2009. The event was a great success bringing together key policy makers, technology developers and users, test centres and investors.

Speakers were attracted to the event from around the world and the final line-up included presentations from the head of the Canadian ETV scheme, John Neate, Pierre Henry from ETAP within the European Commission who is responsible for developing the EU-wide ETV scheme, Caroline Wadsworth from Beta Technology in the UK, Johan Strandberg from the Swedish Environmental Research Centre, Thomas Track from Dechema in Germany and Pentti Pirkonen from the Finnish Technical Research Centre.

Pictured from left: Richard Wrigley Beta Technology, Caroline Wadsworth Beta Technology, Ray Waters One NorthEast, John Neate ETV Canada, Pierre Henry European Commission

Several of the technology developers who had their technologies verified as part of this pilot scheme were also given the opportunity to exhibit at the event helping to add to the 'buzz' of discussion and networking during lunch and coffee breaks. To end the day certificates were presented to each of the technology developers to recognise their success and to acknowledge their contributions to the project and the wider EU ETV scheme preparations.

Transferability of Project Results

There is wide support and evidence to suggest that the technical and commercial application of the TRITECH model is viable. Evidence is already beginning to be collated following the successful verification of several technologies through the TRITECH project which suggests that the technical and commercial application of the scheme will benefit both the users and vendors. Through the development of central verification protocols and testing protocols for each technology type, the process should be fully reproducible so long as the system as a whole is well policed.

Next steps

The European Commission (EC) are currently considering an EU wide ETV scheme and are in the process of defining the proposed scheme details using the results and lessons learnt from TRITECH.

Advance ETV

With the goal of achieving "verified once, accepted everywhere" the EC have also funded the Advance ETV project, aimed at facilitating recognition and acceptance of ETV data amongst the different nationally recognised ETV schemes. This will open up wider market opportunities for technology developers through enabling them to have a verification mark that is recognised and accepted by all similar national verification schemes around the world.

The Environmental Technologies Action Plan (ETAP) team have formed a high level working group involving key ETV players from the major existing schemes (including the US and Canada) to progress negotiations towards achieving "verified once, accepted everywhere".

Useful links

The following links provide further information on EU and global ETV initiatives

www.lifeetv.com (TRITECH ETV website)

www.eu-etv-strategy.eu (Advance ETV)

www.etvcanada.ca (ETV Canada)

www.epa.gov/etv (US EPA ETV)

For further details on the TRITECH ETV project or to keep up to date with the development of a European ETV scheme, please contact Jayne Evans at:

Beta Technology Ltd
www.betatechnology.co.uk
Tel: +44 (0) 1302 – 322633

Beta's core areas of expertise reside within enterprise, innovation support and European funding together with our ability to access to extensive networks and expertise are invaluable to the ETV process. Please don't hesitate to contact us if you require any help or information regarding ETV in Europe.

mouchel

TRITECH Environmental Technology Verification Scheme

Verification Report

TECHNOLOGY TYPE	**Energy Utilisation**
TECHNOLOGY NAME	**Magnetic Conditioning Unit**
COMPANY	**Magnatech Technology Ltd**
WEBSITE	**www.magnatechsavesenergy.com**

Contents

1 Background to ETV

An Environmental Technologies Verification (ETV) scheme is a mechanism to increase exposure and accelerate market acceptance of new and novel environmental technologies. The ETV scheme is primarily aimed at Small and Medium sized Enterprises (SMEs). To enable industry to meet the rigorous challenges of climate change and carbon reduction new innovative technologies must be adopted.

An ETV will give a technology a recognised standard which will install a level of confidence in the end user and therefore accelerate market uptake. Other ETV schemes have been successfully running in Canada and the US for a number of years. Although they have different methodologies, the core outputs are aligned, accelerating market acceptance of innovative environmental technologies.

There are many benefits of an ETV for both the technology vendor and the end user. The scheme provides the vendor with an independent verification of its claims, and provides investors and buyers with confidence about the degree of risk they are taking. Output will provide a Europe wide showcase for the technology.

TRITECH ETV

TRITECH ETV (Environmental Technologies Verification) is a pilot project to develop an EU wide scheme for validating the performance of environmental technologies, and is funded by the European Union's LIFE Environment Programme.

The scheme has been set up 'to establish a mechanism to validate objectively the performance of innovative environmental technology products'. Environmental technologies can be defined as 'all technologies whose use is less environmentally harmful than relevant alternatives'. This includes technologies that manage pollution, are less polluting and less resource intensive.

For technology providers and vendors, persuading the market of the environmental benefits of a particular technology can be a difficult and daunting one. This is especially true for Small and Medium sized Enterprises (SMEs). The links between the provider and the purchaser need strengthening to instil both confidence and acceptability for all parties.

The overall aim of the TRITECH project is to establish a mechanism to objectively validate the performance claims of innovative environmental technology products; this will ultimately lead to new environmental technologies being introduced into the market place at a much quicker rate.

The TRITECH ETV focuses on three technology themes; soil remediation, waste water and energy related technologies. Project partners have been brought together to provide the necessary expertise in each of the technology areas. Each partner is

to develop a methodology to test and verify the environmental claims made by the vendor. To ensure that the methodologies are robust the project partner must engage at least five environmental technologies in their specific areas and test the technology through their pilot methodology.

2 Technology Vendor Information

Country of Origin:	UK
Language:	English
Currency:	Pound Stirling
Company Name:	Magnatech Technology Ltd
Contact Name:	Simon Goodchild
Address:	239 Regents Park Road LONDON
Post Code:	N3 3LF
Telephone Number:	01440 762010
Mobile Telephone Number:	07767 791450
Email Address:	simon@magnatechsavesenergy.com
Website:	www.magnatechsavesenergy.com

3 Technology Descriptions

Technology Name:	Magnetic fuel conditioning
Technology Description:	Magnatech Technology Ltd have developed a magnetic fuel conditioning unit which consists of powerful permanent magnets placed on the outside of a hydrocarbon fuel line in a particular pattern. This leads to an increase in flame temperature for a given amount of fuel, reducing fuel consumption.
Technology Type:	Energy Utilisation: The magnetic fuel conditioning units increase the flame temperature thus burning the hydrocarbon fuel quicker to reach the desired boiler temperature, the boiler will stop burning hydrocarbon fuel once the temperature is reached and therefore it utilises the amount of fuel consumed.
Innovative Features:	Magnatech magnetic fuel conditioning units attach to the outer surface of the fuel supply pipe and are therefore require no downtime or change in pipe infrastructure. Competing technologies require the fuel conditioning unit to be in direct contact with the fuel.

4 Environmental Claims

The ETV scheme is a claims based scheme whereby technology vendors put forward environmental claims relating to their technology. These claims are then verified through specific tests.

Claim 1:

When installing a Magnatech magnetic fuel conditioning unit to the inlet supply pipe of a commercial boiler the hydrocarbon fuel consumption of that boiler will be reduced by at least 6% compared to previous consumption rates.

Supporting Documentation (independent testing to verify the claim)

There are many testimonials to verify this claim

5 Testing

Independent testing is required to verify the claims that are being put forward by the technology vendor.

Test Protocol:

The principle of the trial is to install Magnatech fuel conditioning units to gas boilers to understand the impact on the fuel consumption. Initially a boiler is monitored to record the hydrocarbon fuel consumption for a set period, the boiler run time and degree day data will remove the impact of external factors such as change in weather temperature. The Magnatech units will then be installed and the same parameters monitored.

The data captured will be analysed to determine the effects on the gas consumption of the boiler.

Test Centre:

The trial was undertaken at Pfizer Ltd, Whalton Road, Morpeth, Northumberland, NE61 3YA. Pfizer (now owned by NPIL) are a Pharmaceutical company and the boilers served the QA lab of a factory.

All monitoring was undertaken by using the onsite BMS system and the degree day data recorded and published by the Met Office.

Logging equipment:

The Building Management System onsite monitored the date, boiler hours run, gas meter readings, gas consumption in M^3. This combined with the degree day data allowed for a comparison of data.

Test Result:

The boilers were monitored for 56 days prior to the installation of the fuel conditioning units. Throughout this period the average daily gas consumption was 379.6 m^3. The degree day data gathered from the Met Office was applied to the consumption resulting in the degree day data applied daily gas consumption being 57.9 m^3. The magnetic fuel conditioning units were installed to the gas inlet pipe and the boiler was monitored again for 65 days. Throughout this period the average daily gas consumption was 516.7 m^3. The degree day data gathered from the Met Office was applied to the consumption resulting in the degree day data applied daily gas consumption being 52 m^3. This resulted in a gas consumption saving of (57.9-52)/57.9 = 10.2% saving

Performance Conditions:

The trial was undertaken in a boiler room with the QA labs of a Pharmaceuticals company. The boiler chosen was isolated from other systems and only used to provide central heating and hot water for the QA labs.

When assessing the performance of a heating system in buildings, external factors such as weather are a major factor in the results, utilising degree day data is an industry recognised method to ensure these external factors are compensated for.

6 Verification of Claims

The data set analysed for claim verification was generated from a full scale trial on two Cochran Wee Chieftain Boilers both were Natural Gas fired at 750,000 BTU. The site was a pharmaceuticals factory in Morpeth, Northumberland. There were a total of 16 Magnatech magnetic fuel conditioning units installed on the gas inlet supply pipe of the boilers.

The test was performed by the independent logging equipment set up specifically for the boiler. The boiler run time, gas consumption and degree day date were logged through out the duration of the trial, 56 days prior to installation and 65 days post installation.

The verification of environmental claim 1 is substantiated through the results gathered in the test. The boiler gas consumption reduced by 10.2% after the Magnatech fuel conditioning units were installed onto the inlet supply pipe.

7 Marketing

Logo

Magnatech Technology Ltd will be able to use the TRITECH ETV logo on any of their literature and product range

Certificate

Magnatech Technology Ltd will be awarded a TRITECH ETV certificate reflecting the results from the verification tests.

ETV Website

Magnatech Technology Ltd will be listed on the TRITECH ETV website under the Energy; Energy Optimisation section. Magnatech will be able to have a hyperlink from their own website to the TRITECH ETV website, to direct potential customers to the verification.

Trial Methodology – Magnatech Technology Ltd

Environmental Technology Verification

This document will indentify the trial that Magnatech Technology Ltd undertook to ensure the environmental claims that have been put forward through the TRITECH ETV scheme can be independently verified

Environmental Claims

Magnatech Fuel Conditioning Ltd have developed a magnetic fuel conditioning unit which consists of powerful permanent magnets placed on the outside of a hydrocarbon fuel line in a particular pattern. This leads to an increase in flame temperature for a given amount of fuel, reducing fuel consumption.

1. The installation of Magnatech magnetic fuel conditioning units in a particular pattern onto the external surface of the hydrocarbon inlet pipe of a boiler will reduce hydrocarbon fuel consumption by at least 6%.

Principle of Trial:

The principle of the trial is to monitor and record the hydrocarbon fuel consumption of a boiler before and after the installation of magnetic fuel conditioning units. This will determine the reduction in fuel consumption that is apparent due to the increase in flame temperature.

Independent Verification:

The steps associated to the verification trial:

1) Select a suitable boiler. One where there is high confidence in previous recordings, where monitoring of boiler variations can be accurately measured. If possible where there is consistent demand.

2) Monitor the ambient temperature, fuel consumption and run time of the boiler for a period of 3 months ideally, but at least 6 weeks.

3) Install the magnetic fuel conditioning units to the fuel supply pipe of the boiler.

4) Monitor the ambient temperature, fuel consumption and run time of the boiler for a period of a further 3 months with the magnetic fuel conditioning units attached.

5) Gather the data from the trial and submit for verification

Dates for Conducting Trial/Verification:

-Site 1- Pfizer's (now NPIL) Morpeth site. 25th November to 15th March 2005

Site of Trial and Verification:

-Pfizer Ltd, Whalton Road, Morpeth, Northumberland, NE61 3YA

Trial Data Recording

Date, Boiler hours run, Gas readings, Gas consumption in M3, degree days, cost savings.

Logging equipment Used

-In house BMS system data electronically captured.

Comparative Fuel Consumption Evaluation

Magnatech Technology Ltd

1. Introduction

TRITECH ETV (Environmental Technologies Verification) is a pilot project to develop an EU wide scheme for validating the performance of environmental technologies, and is funded by the European Union's LIFE Environment Programme.

The overall aim of the TRITECH project is to establish a mechanism to objectively validate the performance claims of innovative environmental technology products; this will ultimately lead to new environmental technologies being introduced into the market place at a much quicker rate.

Through One North East, one of the project partners, Mouchel is working to develop and test a model to verify the environmental claims of market ready energy related technologies. This encompasses energy generation through to utilisation and will address different market sectors including utilities, transportation and the built environment.

The agreed scope of work is to monitor the fuel consumption of a hydrocarbon fuel boiler for a period prior to the installation of magnetic fuel conditioning units and after the units have been installed to determine the reduction in consumption.

2. Project Scope and Details

TRITECH ETV (Environmental Technologies Verification) is a pilot project to develop an EU wide scheme for validating the performance of environmental technologies, and is funded by the European Unions LIFE Environment Programme.

3. Site Details

Site 1 Pfizer Pharmaceutical Factory in Morpeth, the boiler chosen was isolated from other systems and only used to provide central heating and hot water for the QA labs. The site is a multi product site now owned by Nicholas Piramal of India – NPIL.

4. Equipment to be evaluated

The 2 boilers were Cochran Wee Chieftain Boilers both were Natural Gas fired at 750,000 BTU.

Magnatech units, powerful Neodynium permanent magnets arranged in a particular pattern on the outside of the incoming fuel line. The outcome of the magnets is to increase the flame temperature for the same level of fuel consumption. This effect has also been confirmed in research papers published by Elsevier, Physica B 1996, Wakayama, Magnetic promotion of combustion in diffusion flames.

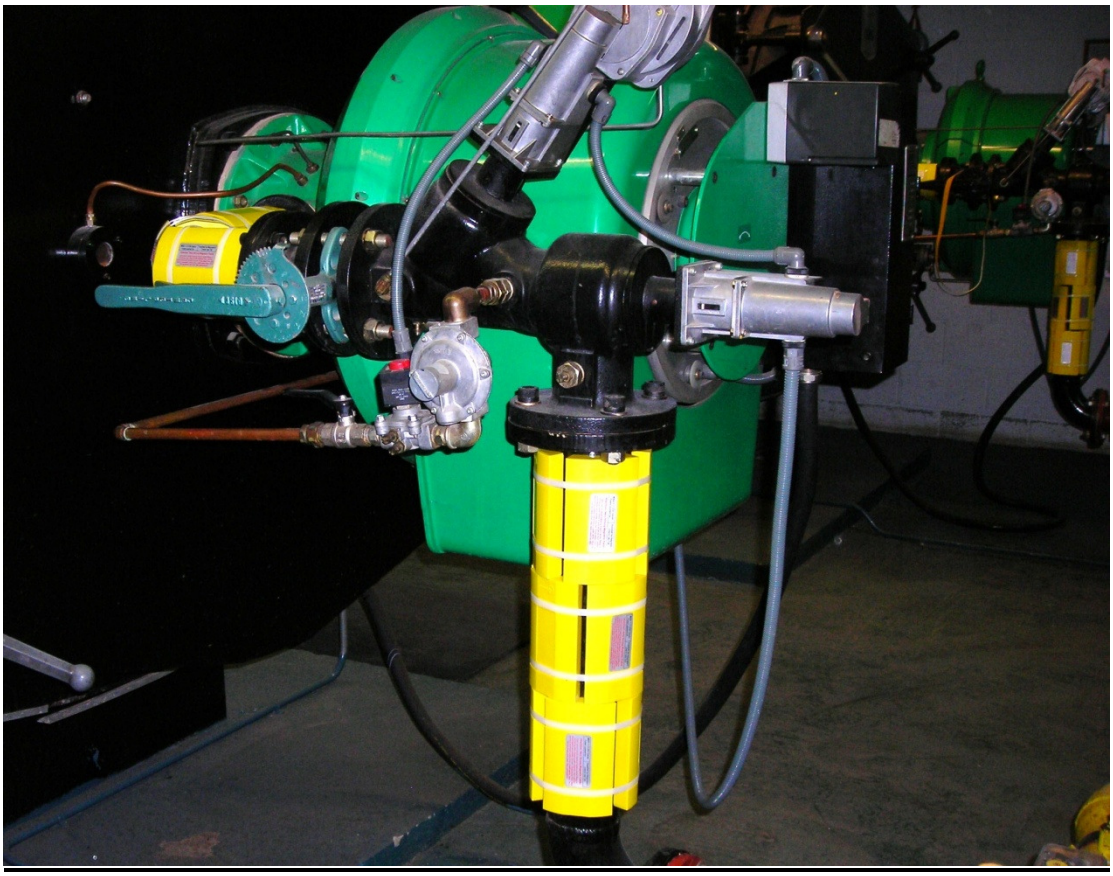
5. Monitoring Equipment

A sophisticated automatic electronic monitoring system, part of the Building Management System collected all data.

6. Environmental Claim

The installation of Magnatech magnetic fuel conditioning units in a particular pattern onto the external surface of the hydrocarbon inlet pipe of a boiler will reduce hydrocarbon fuel consumption by at least 6%.

7. Magnetic fuel conditioning units on trial



Magnatech Units on a boiler natural gas fuel line.

8. Monitored Results

It was agreed that the boiler would be monitored for a period of 3 months without the magnetic fuel conditioning unit attached and 3 months with the units installed.

Table 8.1 details the information gathered over the monitored period before the Magnatech fuel conditioning units were installed. The monitoring period was reduced to 56 days before the magnets were installed.

Table 8.1

Date	Boiler 1 Hrs Run	Boiler 2 Hrs Run	Gas Reading	Gas Consumption m^3	Degree Days (Met Office 2004)	Gas Consumption m^3/ Degree Day
01-Oct-04	66	79	2360575	288	5.548	51.91059841
02-Oct-04	66	85	2360873	298	5.548	53.71304975
03-Oct-04	66	91	2361209	336	5.548	60.56236482
04-Oct-04	72	91	2361528	319	5.548	57.49819755
05-Oct-04	78	91	2361879	351	5.548	63.26604182
06-Oct-04	84	91	2362186	307	5.548	55.33525595
07-Oct-04	90	91	2362547	361	5.548	65.06849315
08-Oct-04	96	91	2362870	323	5.548	58.21917808
09-Oct-04	102	91	2363218	348	5.548	62.72530642
10-Oct-04	109	91	2363585	367	5.548	66.14996395
11-Oct-04	109	97	2363920	335	5.548	60.38211968
12-Oct-04	109	103	2364252	332	5.548	59.84138428
13-Oct-04	109	108	2364585	333	5.548	60.02162942
14-Oct-04	109	114	2364899	314	5.548	56.59697188
15-Oct-04	109	120	2365242	343	5.548	61.82408075
16-Oct-04	109	127	2365622	380	5.548	68.49315068
17-Oct-04	109	133	2366006	384	5.548	69.21413122
18-Oct-04	116	134	2366386	380	5.548	68.49315068
19-Oct-04	123	134	2366767	381	5.548	68.67339582
20-Oct-04	130	134	2367182	415	5.548	74.80173035
21-Oct-04	137	134	2367561	379	5.548	68.31290555
22-Oct-04	144	134	2367953	392	5.548	70.65609229
23-Oct-04	152	134	2368377	424	5.548	76.42393655
24-Oct-04	159	134	2368761	384	5.548	69.21413122
25-Oct-04	160	140	2369107	346	5.548	62.36481615
26-Oct-04	160	146	2369471	364	5.548	65.60922855
27-Oct-04	160	154	2369874	403	5.548	72.63878875
28-Oct-04	160	161	2370257	383	5.548	69.03388609
29-Oct-04	160	167	2370588	331	5.548	59.66113915
30-Oct-04	160	173	2370937	349	5.548	62.90555155
31-Oct-04	160	179	2371302	365	5.548	65.78947368
01-Nov-04	166	180	2371675	373	8.133	45.86253535
02-Nov-04	173	180	2372070	395	8.133	48.56756424
03-Nov-04	180	180	2372439	369	8.133	45.37071191
04-Nov-04	187	180	2372812	373	8.133	45.86253535
05-Nov-04	194	180	2373201	389	8.133	47.82982909
06-Nov-04	200	180	2373582	381	8.133	46.84618222
07-Nov-04	207	180	2373902	320	8.133	39.34587483
08-Nov-04	207	186	2374263	361	8.133	44.38706504

Date	Boiler 1 Hrs Run	Boiler 2 Hrs Run	Gas Reading	Gas Consumption m^3	Degree Days (Met Office 2004)	Gas Consumption m^3/Degree Day
09-Nov-04	207	192	2374635	372	8.133	45.73957949
10-Nov-04	207	200	2375041	406	8.133	49.92007869
11-Nov-04	207	207	2375465	424	8.133	52.13328415
12-Nov-04	207	214	2375832	367	8.133	45.1248002
13-Nov-04	208	221	2376254	422	8.133	51.88737243
14-Nov-04	208	229	2376702	448	8.133	55.08422476
15-Nov-04	215	229	2377097	395	8.133	48.56756424
16-Nov-04	222	229	2377497	400	8.133	49.18234354
17-Nov-04	228	229	2377840	343	8.133	42.17385958
18-Nov-04	235	229	2378230	390	8.133	47.95278495
19-Nov-04	244	229	2378728	498	8.133	61.23201771
20-Nov-04	255	229	2379341	613	8.133	75.37194147
21-Nov-04	265	229	2379921	580	8.133	71.31439813
22-Nov-04	267	236	2380380	459	8.133	56.43673921
23-Nov-04	267	243	2380751	371	8.133	45.61662363
24-Nov-04	267	250	2381161	410	8.133	50.41190213
25-Nov-04	267	257	2381547	386	8.133	47.46096151

Table 8.2 details the information gathered over the monitored period after the Magnatech fuel conditioning units were installed. The monitoring period for this stage of the trial was 65 days. It was felt that the periods were of significant and comparable length to continue with the trial. There is a long period between the monitoring of the gas consumption prior to installation and the monitoring period after installation, this was due to the time it takes for the magnets to penetrate the pipe and in this particular scenario the Christmas break hindered monitoring.

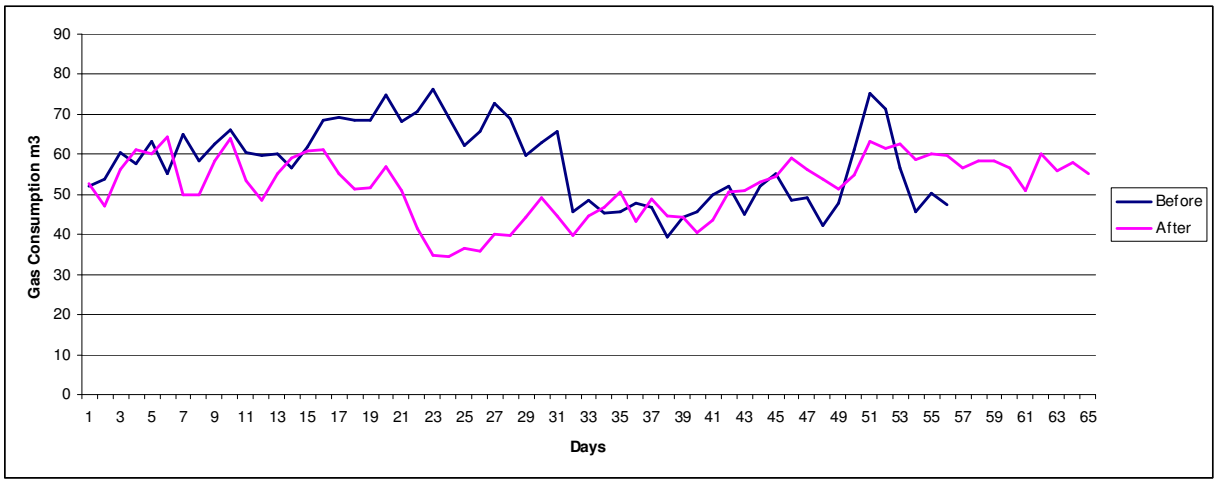
Table 8.2

Date	Boiler 1 Hrs Run	Boiler 2 Hrs Run	Gas Reading	Gas Consumption m^3	Degree Days (Met Office 2004)	Gas Consumption m^3/Degree Day
10-Jan-05	502	436	2404604	493	9.356	52.69345874
11-Jan-05	510	436	2405046	442	9.356	47.24241129
12-Jan-05	519	436	2405572	526	9.356	56.2206071
13-Jan-05	529	436	2406143	571	9.356	61.03035485
14-Jan-05	539	436	2406706	563	9.356	60.17528858
15-Jan-05	550	436	2407308	602	9.356	64.34373664
16-Jan-05	558	436	2407776	468	9.356	50.02137666
17-Jan-05	559	443	2408244	468	9.356	50.02137666
18-Jan-05	561	451	2408791	547	9.356	58.46515605
19-Jan-05	564	458	2409390	599	9.356	64.02308679
20-Jan-05	564	467	2409890	500	9.356	53.44164173
21-Jan-05	566	476	2410344	454	9.356	48.52501069
22-Jan-05	566	489	2410859	515	9.356	55.04489098
23-Jan-05	567	502	2411412	553	9.356	59.10645575
24-Jan-05	573	507	2411981	569	9.356	60.81658829
25-Jan-05	580	511	2412554	573	9.356	61.24412142
26-Jan-05	587	514	2413072	518	9.356	55.36554083
27-Jan-05	594	515	2413553	481	9.356	51.41085934
28-Jan-05	602	516	2414038	485	9.356	51.83839248

Date	Boiler 1 Hrs Run	Boiler 2 Hrs Run	Gas Reading	Gas Consumption m^3	Degree Days (Met Office 2004)	Gas Consumption m^3/Degree Day
29-Jan-05	609	518	2414571	533	9.356	56.96879008
30-Jan-05	616	520	2415047	476	9.356	50.87644292
31-Jan-05	616	531	2415434	387	9.356	41.3638307
01-Feb-05	616	543	2415818	384	11.036	34.79521566
02-Feb-05	616	553	2416199	381	11.036	34.52337804
03-Feb-05	616	564	2416604	405	11.036	36.69807901
04-Feb-05	616	576	2416999	395	11.036	35.79195361
05-Feb-05	616	589	2417442	443	11.036	40.14135556
06-Feb-05	616	601	2417880	438	11.036	39.68829286
07-Feb-05	623	603	2418368	488	11.036	44.2189199
08-Feb-05	631	605	2418912	544	11.036	49.29322218
09-Feb-05	638	607	2419405	493	11.036	44.6719826
10-Feb-05	645	607	2419843	438	11.036	39.68829286
11-Feb-05	652	608	2420335	492	11.036	44.58137006
12-Feb-05	660	610	2420850	515	11.036	46.6654585
13-Feb-05	668	612	2421410	560	11.036	50.74302283
14-Feb-05	668	625	2421886	476	11.036	43.13156941
15-Feb-05	668	641	2422424	538	11.036	48.74954694
16-Feb-05	668	654	2422915	491	11.036	44.49075752
17-Feb-05	668	668	2423402	487	11.036	44.12830736
18-Feb-05	668	680	2423850	448	11.036	40.59441827
19-Feb-05	668	694	2424332	482	11.036	43.67524465
20-Feb-05	668	711	2424891	559	11.036	50.65241029
21-Feb-05	668	727	2425455	564	11.036	51.105473
22-Feb-05	675	732	2426042	587	11.036	53.18956144
23-Feb-05	682	736	2426645	603	11.036	54.63936209
24-Feb-05	689	741	2427295	650	11.036	58.8981515
25-Feb-05	696	745	2427914	619	11.036	56.08916274
26-Feb-05	703	749	2428506	592	11.036	53.64262414
27-Feb-05	711	752	2429074	568	11.036	51.46792316
28-Feb-05	718	757	2429680	606	11.036	54.91119971
01-Mar-05	718	770	2430261	581	9.16	63.4279476
02-Mar-05	718	785	2430823	562	9.16	61.35371179
03-Mar-05	719	799	2431395	572	9.16	62.44541485
04-Mar-05	719	814	2431934	539	9.16	58.84279476
05-Mar-05	719	829	2432486	552	9.16	60.26200873
06-Mar-05	719	844	2433033	547	9.16	59.71615721
07-Mar-05	719	858	2433552	519	9.16	56.65938865
08-Mar-05	726	861	2434086	534	9.16	58.29694323
09-Mar-05	733	863	2434620	534	9.16	58.29694323
10-Mar-05	741	865	2435137	517	9.16	56.44104803
11-Mar-05	750	865	2435603	466	9.16	50.87336245
12-Mar-05	763	866	2436154	551	9.16	60.15283843
13-Mar-05	775	866	2436665	511	9.16	55.7860262
14-Mar-05	788	866	2437196	531	9.16	57.96943231
15-Mar-05	801	866	2437701	505	9.16	55.13100437

Figure 8.1 is a graph detailing the gas consumption before and after the installation of the Magnatech fuel conditioning units. The graph uses the gas consumption which incorporates the degree day data.

Figure 8.1



9. Energy Calculations

The boilers were monitored for 56 days prior to the installation of the fuel conditioning units. Throughout this period the average daily gas consumption was 379.6 m^3. The degree day data gathered from the Met Office was applied to the consumption resulting in the degree day data applied gas consumption being 57.9 m^3/day. The magnetic fuel conditioning units were installed to the gas inlet pipe and the boiler was monitored again. The boilers were monitored for a period of 65 days once the fuel conditioning units had been installed, throughout this period the average daily gas consumption was 516.7 m^3. The degree day data gathered from the Met Office was applied to the consumption resulting in the degree day data applied daily gas consumption being 52 m^3/day. This resulted in a gas consumption saving of (57.9-52)/57.9 = **10.2% saving**

11. Conclusion

The trial at the Pfizer plant was undertaken to monitor the gas consumption of a gas boiler prior to installing magnetic fuel conditioning units and then a comparison was drawn once the Magnatech units had been installed. Magnatech Fuel Conditioning Ltd claimed that the installation of the conditioning units would reduce hydrocarbon fuel consumption by at least 6%. This trial at Pfizer confirmed that the Magnatech units reduced the fuel consumption during the monitoring period by 10.2%. This data was made apparent by the use of degree day data which enabled the fair use of the boiler during varying weather conditions.

TRITECH ETV

CERTIFICATE

TRITECH ETV hereby certifies that

Magnatech Fuel Conditioning Ltd

has been verified through the TRITECH Environmental Technology Verification Scheme and been authorised to use the TRITECH ETV logo to endorse the verified technology

The Environmental Technology Verification Scheme is an objective mechanism for validating the performance of environmental technologies

Technology Description

Magnatech is a magnetic fuel conditioning unit which consists of powerful permanent magnets placed on the outside of a hydrocarbon fuel line in a particular pattern. This leads to an increase in flame temperature for a given amount of fuel, reducing fuel consumption.

Verified Environmental Claims

1. ***Magnatech Fuel Conditioning Units will reduce hydrocarbon fuel consumption of a boiler by at least 6%.***

TRITECH ETV Project Director…….(Antony Davies)

Issued to: Magnatech Fuel Conditioning Ltd
Reference Number: TRIETV002
Verification Date: 27/08/2009
Refer to Verification Report for additional supporting information