

Case Study Gas Fuel Optimisers

A series of trials resulting in
126 installations in Waitrose
supermarkets across the UK

A photograph of a Waitrose & Partners storefront at night. The building has large glass windows and doors. The words "WAITROSE" and "& PARTNERS" are visible in large, illuminated green letters above the entrance. The interior of the store is visible through the glass, showing bright lights and some displays. The image is partially obscured by a large green graphic element on the right side of the page.

WAITROSE
& PARTNERS

Case Study

First trials

Waitrose, part of the John Lewis Group, and one of the UK's leading supermarkets conducted trials of units in two contrasting store types, small "supermarkets" and "super stores". This case study examines the data and results from 15 of the 126 stores in which the System was installed. The results positively showed that payback times were within those claimed and reductions in fuel consumption of well over the guaranteed minimum.

15.6% Average Savings Per Store

£40,384.90 Annual Saving**

4,647,630kg CO₂e Reduction**

Trial Details

Customer:	John Lewis Group/Waitrose
Trial Period:	8 Months
Report Date:	15/01/25
Property Type/Use:	Commercial/Retail Properties

Average annual savings per store

(Using Chart 2 & the percentage reduction calculation on P6)*

Time Period	Money Saved	CO ₂ e Reduction
Year 1	£4,038.49	464,763 kg
Year 5	£20,192.45	2,323,815 kg
**Year 10	£40,384.90	4,647,630 kg

*Calculated using gas prices correct on the date of report.

**Accumulated savings over a 10 year period.

Total consumption in Yr 1, without Units installed.

Total Kw/hr	Total HDD	kW/HDD
672,564	1,103	609
603,419	1,103	547
649,148	1,103	589
531,928	1,133	469
541,763	1,133	478
618,404	1,133	546
536,992	1,055	509
884,394	1,055	838
518,966	1,055	492
752,746	1,074	719
730,828	1,042	701
738,447	1,103	669
7,779,599		

Total Kw/hr = 7,779,599

Divide by the 12 stores supplying viable data (see pg7)

Avg. total Kw/hr per site = 648,300

Multiply by the average saving of 15.6%

Avg. total Kw/hr saving per site = 101,135

Divide by 29.3 to convert to therms

Avg. total therms saving per site = 3,451.7

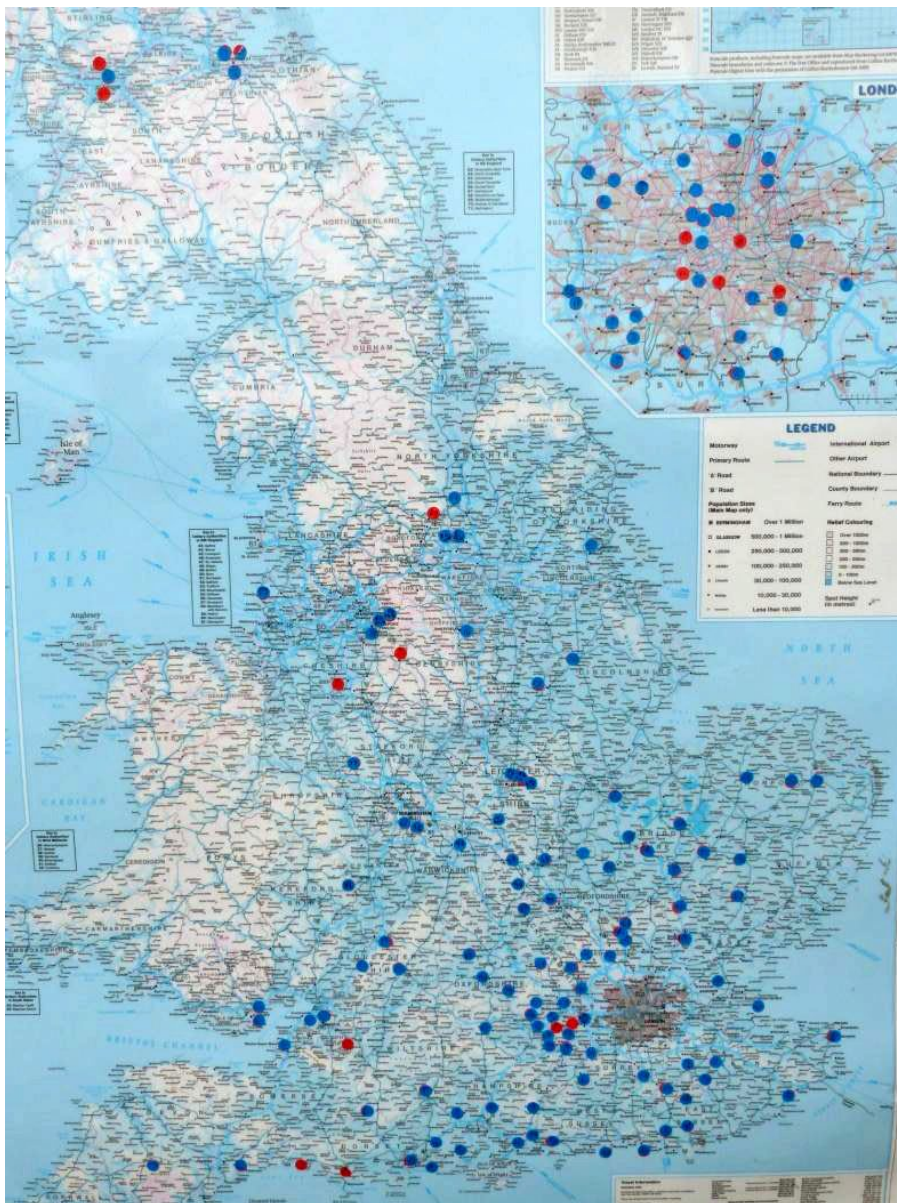
Multiply by the cost per therm* (1.17gbp at the time of report)

Avg. total cost saving per site = £4,038.49

Case Study

Partial roll out

Funding was obtained for a much larger installation and 100 of the largest fuel consuming stores throughout England, Scotland and Wales were selected. The installations were completed within the agreed time frame and came in under budget. An additional 6 stores had units installed with the remaining budget. Analysis of 15 of the first batch of stores is attached.



Case Study

Appliances included in the trial

The boilers found on the sites varied from modern condensing boilers to much older, less efficient boilers. The stores also had air handling units, often on the roof and separate water heaters. All gas fired units apart from those in the staff dining room, public restaurants and bake off ovens had units installed.

Roof Air Handling Units



Roof Air Handling Units



Condensing Boilers



Water Heaters



Older Boilers



Calculation of Consumption Differences

Chart 1: Consumption from June to January in year 1 without the System installed

HDD Centre									Total Kw/hr	Total HDD	kW/HDD	
	Site Name	Jun Yr1	Jul Yr1	Aug Yr1	Sep Yr1	Oct Yr1	Nov Yr1	Dec Yr1	Jan Yr1			
1	Kingsthorpe	60,370	47,048	48,343	45,912	76,105	105,960	145,185	143,641	672,564	1,103	609
1	Daventry	63,463	35,908	53,453	54,608	71,496	95,657	118,480	110,354	603,419	1,103	547
1	Towcester	50,486	29,466	31,431	42,959	126,341	89,618	135,549	143,298	649,148	1,103	589
2	Kenilworth	49,442	41,422	42,276	45,797	63,288	89,216	100,324	100,163	531,928	1,133	469
2	Newport	47,083	24,769	25,479	37,653	101,783	76,467	116,653	111,876	541,763	1,133	478
2	Harborne	49,758	44,669	50,254	43,565	75,200	88,718	126,340	139,900	618,404	1,133	546
3	Witney	37,024	39,803	32,526	31,981	61,664	97,390	120,308	116,296	536,992	1,055	509
3	Thame	62,710	60,155	61,205	65,451	105,457	138,991	168,307	222,118	884,394	1,055	838
3	Abingdon	48,118	38,503	40,139	45,132	60,357	79,240	100,457	107,020	518,966	1,055	492
3	Wallingford	44,318	33,921	34,512	36,886	63,174	2,130	3,694	3,971	222,606	1,055	211
4	Reading	65,360	53,821	54,749	58,556	100,231	117,877	161,018	141,134	752,746	1,074	719
4	Wokingham	53,403	42,818	49,198	52,810	77,507	96,527	125,407	136,944	634,614	1,074	591
5	Lincoln	32,658	45,923	39,096	82,141	114,651	121,264	138,443	129,772	703,948	1,138	619
6	Hythe	57,262	52,755	51,615	55,473	92,634	123,734	169,140	128,215	730,828	1,042	701
1	Milton Keynes	60,984	56,996	52,361	62,205	68,626	96,905	162,622	177,748	738,447	1,103	669

Chart 2: Consumption from June to January in year 2 with the System installed

HDD Centre									Total Kw/hr	Total HDD	kW/HDD	
	Site Name	Jun Yr2	Jul Yr2	Aug Yr2	Sep Yr2	Oct Yr2	Nov Yr2	Dec Yr2	Jan Yr2			
1	Kingsthorpe	69,862	53,162	56,213	70,160	111,837	138,960	158,445	171,172	829,811	1,479	561
1	Daventry	65,765	55,111	55,677	53,784	68,490	111,566	117,887	121,967	650,247	1,479	440
1	Towcester	63,316	44,985	46,386	58,355	91,085	137,386	175,439	187,502	804,454	1,479	544
2	Kenilworth	57,635	40,581	41,544	55,309	79,680	103,437	119,022	132,059	629,267	1,448	435
2	Newport	59,482	41,393	42,607	64,665	86,465	87,998	120,942	81,761	585,313	1,448	404
2	Harborne	76,827	2,556	59,193	73,932	100,965	119,948	133,858	131,714	698,993	1,448	483
3	Witney	51,077	45,081	45,541	52,698	72,754	90,778	106,813	99,810	564,552	1,331	424
3	Thame	97,937	68,447	63,382	84,452	159,332	152,949	179,435	170,914	976,848	1,331	734
3	Abingdon	46,842	49,621	49,731	44,894	66,592	75,620	97,337	86,434	517,071	1,331	388
3	Wallingford	48,613	1,089	1,118	1,359	2,275	2,998	3,731	3,712	64,895	1,331	49
4	Reading	69,984	58,834	59,430	73,315	101,806	124,759	174,566	173,130	835,824	1,356	616
4	Wokingham	52,483	53,322	55,661	72,753	105,470	126,283	150,681	146,358	763,011	1,356	563
5	Lincoln	35,806	12,833	13,951	5,524	90,086	100,532	128,494	137,100	524,326	1,435	365
6	Hythe	47,384	40,146	40,491	69,613	145,142	153,928	94,970	90,564	682,238	1,279	533
1	Milton Keynes	61,835	50,257	51,426	57,965	90,869	114,146	139,219	133,401	699,118	1,479	473

Case Study

Calculating the results

By analysing the gas consumption over the same periods for Years 1 and 2 and using local degree day weather stations, the differences before and after the units were installed were calculated.

Heating Degree Day weather stations used

(refer to the tables on the previous page for which sites used which weather stations)

- 1. Newport Pagnell - EGGW: Luton Airport (0.37W,51.87N)**
- 2. Birmingham Airport - EGBB: Birmingham / Airport (1.76W,52.46N)**
- 3. Brize Norton - EGVN: Brize Norton (1.58W,51.76N)**
- 4. Benson Airfield - EGUB: Benson (1.10W,51.62N)**
- 5. Waddington Airfield - EGXW: Waddington (0.52W,53.18N)**
- 6. Southampton Airport - EGH: Southampton / Weather Centre (1.36W,50.95N)**

The calculation using the data on page 5

Consumption/HDD = Avg per HDD = A

A Year 1 - A Year 2 = B

B/A Year 1 x 100 = Percentage difference between the years.

Eg: Kingsthorpe

$672564 / 1103 = 609$ (Year 1) [A]

$829,811 / 1479 = 561$ (Year 2) [B]

So A - B

$609 - 561 = 48$

$48/609 \times 100 = 7.88\%$ reduction

Case Study

Calculating the results

Using the formula shown on the previous page, the savings achieved by each store were calculated:

Site Name	Percentage reduction	Anomaly adjustment
Kingsthorpe	7.88	7.88
Daventry	19.56	19.56
Towcester	7.64	7.64
Kenilworth	7.24	7.24
Newport	15.48	15.48
Harborne	11.53	11.53
Witney	16.69	16.69
Thame	12.41	12.41
Abingdon	21.13	21.13
Wallingford	76.77	drop
Reading	14.32	14.32
Wokingham	4.73	drop
Lincoln	41.03	drop
Hythe	23.96	23.96
Milton Keynes	29.29	29.29

20.6% **15.6%**

The two top extreme figures and one exceptionally low figure were dropped - there will be other factors involved in these sites.

Stage 2 trials

Following the initial trial and the positive results that were concluded from it, the supermarket agreed to submit further funds for a second trial of another 20 stores. This was carried out in a two-week window in the January of Year 2. By using stock held in the UK offices we were able to complete the installations and remain within both the time frame and budget allowed.

Case Study

Conclusion

“The results positively showed that payback times were within those claimed and reductions in fuel consumption of well over the guaranteed minimum”.

15.6% Average Savings per store

£40,384.90 Annual Saving^{*/}**

4,647,630kg CO₂e Reduction^{}**

*Calculated using gas prices correct on the date of report. **Accumulated savings over a 10 year period.

Measurement & Verification (M&V)

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.

Checks are made to ensure there is no variation in occupancy or building use during the study period.



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