

To	15.5	Gas Totals (m³)	Minus Base Load	M2G Mode	
04/02/2014 00:00	11	669	583	504	OFF
06/02/2014 00:00	11.3	680	594	515	OFF
08/02/2014 00:00	9.5	719	633	554	OFF
11/02/2014 00:00	13.1	732	646	567	OFF
13/02/2014 00:00	13.3	716	630	551	OFF
15/02/2014 00:00	9.9	681	595	516	OFF
18/02/2014 00:00	9.2	635	549	470	OFF
20/02/2014 00:00	9.8	523	437	358	OFF
22/02/2014 00:00	9.1	663	577	498	OFF
25/02/2014 00:00	9.4	420	334	255	OFF
27/02/2014 00:00	10.3	451	365	286	OFF
01/03/2014 00:00	9.7	645	559	480	OFF
04/03/2014 00:00	9.9	646	560	481	OFF
06/03/2014 00:00	5.9	617	531	452	OFF
08/03/2014 00:00	6.8	492	406	327	OFF
11/03/2014 00:00	10.2	611	525	446	OFF
13/03/2014 00:00	9.5	565	479	400	OFF
15/03/2014 00:00	5.8	504	418	339	OFF
18/03/2014 00:00	6.2	457	371	292	OFF
20/03/2014 00:00	8.6	475	389	310	OFF
22/03/2014 00:00	12.3	671	585	506	OFF
25/03/2014 00:00	9.4	621	535	456	OFF
27/03/2014 00:00	11	585	499	420	OFF
29/03/2014 00:00	10.1	651	565	486	OFF
01/04/2014 00:00	7.6	539	453	374	OFF
03/04/2014 00:00	5.8	468	382	303	OFF
05/04/2014 00:00	5	427	341	262	OFF
08/04/2014 00:00	7.7	504	418	339	OFF
10/04/2014 00:00	6.8	481	395	316	OFF
12/04/2014 00:00	6.6	537	451	372	OFF
15/04/2014 00:00	6.9	426	340	261	OFF
17/04/2014 00:00	4.8	325	239	160	OFF
19/04/2014 00:00	7.6	317	231	152	OFF
22/04/2014 00:00	5.5	373	287	208	OFF
24/04/2014 00:00	6.6	335	249	170	OFF
26/04/2014 00:00	6.9	334	248	169	OFF
29/04/2014 00:00	5.9	305	219	140	OFF
01/05/2014 00:00	4.2	310	224	145	OFF
03/05/2014 00:00	5.2	317	231	152	OFF
06/05/2014 00:00	6.2	355	269	190	OFF
08/05/2014 00:00	3.2	364	278	199	OFF
10/05/2014 00:00	5.3	272	186	107	OFF
13/05/2014 00:00	4.8	349	263	184	OFF
15/05/2014 00:00	2.9	269	183	104	OFF
17/05/2014 00:00	4.1	204	118	39	OFF
20/05/2014 00:00	4.4	326	240	161	OFF
24/05/2014 00:00	6.3	250	164	85	OFF
02/02/2014 00:00	9.7	512	426	347	Active
03/02/2014 00:00	10.1	518	432	353	Active
05/02/2014 00:00	8.7	641	555	476	Active
07/02/2014 00:00	11.3	705	619	540	Active
09/02/2014 00:00	12	460	374	295	Active



Building Description:
Cavanagh School of Pharmacy, University College Cork (Third Level)

Client: University College Cork Buildings and Estates
 Architect: Scott Tallon Walker Architects
 Value(€ million): 16
 Completion date: 2005
 PUNCH services: Civil, Structural, Environmental

The building has a simple concrete frame structure with an all metal rain-screen cladding system, modular opening windows and landscaped Brise Soleil sympathetic with the largely residential houses on College road and the adjoining maternity wing of the Bon Secours Hospital. A decentralized air supply design has been employed for the laboratories providing a flexible low energy solution to the issue of air replacement while a controlled air supply through the atrium/street provides natural convection cooling

The School of Pharmacy building at University College Cork was part of a brief in which the client called for an architecturally outstanding building that would stand the test of time.

The overall project consists of lecture theatres, computer aided learning (CAL) rooms, tutorial rooms, specialist laboratories in Chemistry, Biochemistry, Spectroscopy, formulation, Physiology/ Pharmacology, Practice of Pharmacy etc, a small clean room facility, dedicated research laboratories, offices, meeting rooms and a canteen

Source: Scott Tallon Walker Architects and Punch Consulting Engineers Websites

Project Details:

#2 M2G boiler load controls with interface modules were installed in the Cavanagh Pharmacy Building UCC
 The building heating is controlled as standard through the BMS and powered by
 #2 condensing/modulating boilers with advertised combustion efficiencies of 104%
 The M2G controls were flip flopped in and out of circuit on a 24 hour cycle at mid-night for over 100 days
 Gas consumption data M³ is available every 15min through the UCC energy monitoring system (EMS)
 Daily gas consumption reading were recorded for the 'M2G active' and 'M2G inactive' days
 The M³ data is plotted against daily Heating Degree Days (HDD) taken from Cork Airport
 IE (8.48W.51.85N) for a base temperature of 15.5 C with 0.00% estimation.
 The heating base load was calculated as 85.876 M³ per day or 19.1% of total
 The base load was removed prior to the analysis of M2G inactive v. M2G active days
 M2G savings were calculate using HDD 7.67 (average HDD over the period)
 Savings were calculated at 15.39%
 M2G is compatible with all BMS and BMS strategies
 M2G eliminates nuisance boiler activity (dry cycling, short cycling and short circuiting)
 Modern boilers with high efficiency ratings are not exempt from this activity
 For more information on boiler nuisance activity which can be eliminated through M2G boiler control logic please see the following link
http://www.gem.ie/html/why_m2g.html

ROI Estimates

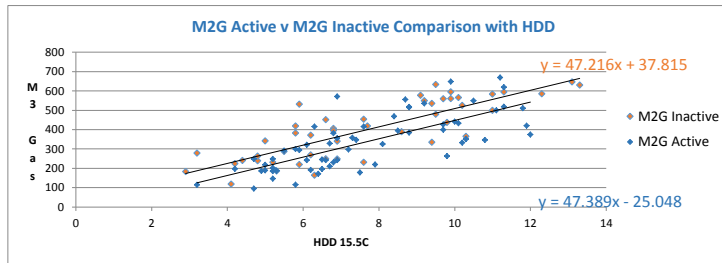
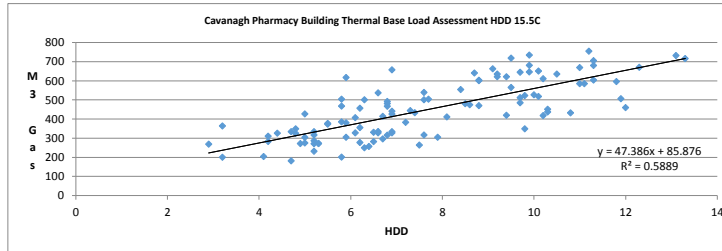
Return on Investment (Based on example #1)
 M2G Project Cost €5,700
 Est. annual Gas Spend €44,300 *

10/02/2014 00:00	11.3	604	518	439	Active
12/02/2014 00:00	11.2	755	669	590	Active
14/02/2014 00:00	9.9	734	648	569	Active
16/02/2014 00:00	10.3	437	351	272	Active
17/02/2014 00:00	8.4	554	468	389	Active
19/02/2014 00:00	6.9	657	571	492	Active
21/02/2014 00:00	11.1	585	499	420	Active
23/02/2014 00:00	7.4	433	347	268	Active
26/02/2014 00:00	9.7	485	399	320	Active
28/02/2014 00:00	11.8	596	510	431	Active
02/03/2014 00:00	10.2	418	332	253	Active
03/03/2014 00:00	10.8	432	346	267	Active
05/03/2014 00:00	8.8	603	517	438	Active
07/03/2014 00:00	7.3	444	358	279	Active
09/03/2014 00:00	7.2	383	297	218	Active
10/03/2014 00:00	9.8	349	263	184	Active
12/03/2014 00:00	9.2	621	535	456	Active
14/03/2014 00:00	7.6	501	415	336	Active
16/03/2014 00:00	6.7	296	210	131	Active
17/03/2014 00:00	7.9	305	219	140	Active
19/03/2014 00:00	6.7	414	328	249	Active
21/03/2014 00:00	11.9	506	420	341	Active
23/03/2014 00:00	10	527	441	362	Active
24/03/2014 00:00	8.8	470	384	305	Active
26/03/2014 00:00	8.8	601	515	436	Active
28/03/2014 00:00	10.5	635	549	470	Active
30/03/2014 00:00	8.5	480	394	315	Active
31/03/2014 00:00	6.9	441	355	276	Active
02/04/2014 00:00	6.3	501	415	336	Active
04/04/2014 00:00	6.1	407	321	242	Active
06/04/2014 00:00	5	304	218	139	Active
07/04/2014 00:00	7.5	264	178	99	Active
09/04/2014 00:00	6.8	467	381	302	Active
11/04/2014 00:00	8.1	411	325	246	Active
13/04/2014 00:00	6.5	331	245	166	Active
14/04/2014 00:00	6.9	328	242	163	Active
16/04/2014 00:00	5.8	385	299	220	Active
18/04/2014 00:00	6.2	277	191	112	Active
20/04/2014 00:00	6.8	316	230	151	Active
21/04/2014 00:00	6.1	328	242	163	Active
23/04/2014 00:00	5.9	380	294	215	Active
25/04/2014 00:00	6.6	328	242	163	Active
27/04/2014 00:00	5.2	334	248	169	Active
28/04/2014 00:00	5	275	189	110	Active
30/04/2014 00:00	4.7	334	248	169	Active
02/05/2014 00:00	5.2	271	185	106	Active
04/05/2014 00:00	4.9	272	186	107	Active
05/05/2014 00:00	5.2	287	201	122	Active
07/05/2014 00:00	5.5	377	291	212	Active
09/05/2014 00:00	5.2	232	146	67	Active
11/05/2014 00:00	6.4	257	171	92	Active
12/05/2014 00:00	6.5	282	196	117	Active
14/05/2014 00:00	4.2	283	197	118	Active
16/05/2014 00:00	3.2	200	114	35	Active
18/05/2014 00:00	4.7	181	95	16	Active
19/05/2014 00:00	5.8	201	115	36	Active
23/05/2014 00:00	5.3	273	187	108	Active
	7.6752	49,004	39,644	80.90%	
			9,360	19.10%	
24/02/2014 00:00	9.9	22	-56		M2G
21/05/2014 00:00	4.9	108	30		M2G
22/05/2014 00:00	5.3	155	77		Normal

Savings based on 15.39% €6,818
 Payback in Months 10

The Green Bit
 Est. Annual kWh 1,107,500
 kWh Savings based on 15.39% 170,444
 Kg Co2 Savings per annum 31,362

*Est gas spend for Cavanagh Pharmacy



Savings Calculations:

Example #1
 Using the average HDD data value of 7.67
 M³ M2G OFF Days = 399.96
 M³ M2G Active Days = 338.43
 M³ Difference = -61.54
 % Difference = -15.39%

Example #2
 Using the average daily HDD value (7.54) from Oct 2013 - May 2014
 393.82
 332.27
 -61.56
 -15.63%