

## **Clonmel Gas Optimisers**

### **Value Assessment**

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## Executive Summary

Tipperary Energy Agency as part of their energy management service for South Tipperary County Council was asked to do a value assessment of the gas optimiser installed in the County Museum. It was installed under recommendation of the TEA on the 5<sup>th</sup> of November 2005 by GEM Ltd. The method of analysis used is to compare the gas usage of the museum before and after installation of the gas optimisers. This is also done for three other public buildings in Clonmel to ensure there is a control for weather changes.

The County museum used 10% less gas after the optimisers were installed, where the combined total gas use for the other three buildings went up by 10 %. This would lead to an indicated saving of 20%. In this case there is no guarantee of scientific independence of the data, as the building load could have increased or decreased slightly over the time frame. With that said, it is very likely that a significant portion of the savings can be allocated to the gas optimiser.

The Optimiser was delivered to the council for an installed cost of €1,425 including Vat at 21%, thus the figures to describe the project are:

- 20 Year NPV (5%) of €18,813
- Simple payback of 13 months
- IRR of 106%
- Money saved to date including investment: €632 (€2,057 Excluding)

GEM gave a heavy discount on the price to entice the council to purchase more of these units. This would give the following figures to the project:

- Investment of €3025 inc Vat
- 20 Year NPV (5%) of €17,289
- Simple payback of 24 months
- 20 Year IRR of 52%

There is a certain threshold of building size that these units would make financial sense for. Using these figures it would make sense to install these units (based on 15% minimum IRR) on buildings of gas consumption of approximately €2,500 per boiler per annum. These figures are based on a flat gas price, and a budget quotation.

## **1 Introduction**

Tipperary Energy Agency as part of their energy management service for south Tipperary County Council was asked to do a value assessment of the Gas optimiser installed in the County Museum. It was installed under recommendation of the TEA on the 5<sup>th</sup> of November 2005. The method of analysis used is to compare the gas usage of the museum before and after installation of the gas optimisers. This is also done for three other public buildings in Clonmel to ensure there is a control for weather changes.

## **2 Audit Details**

The buildings analysed are the

- County Museum on Borstal Square,
- The County Hall,
- The Old Museum, Parnell St.
- The Courthouse.

The data is from October 2004 to February 2007 inclusive. The data comes from the Gas bills straight form Bord Gais.

### 3 Energy Audit Data

#### 3.1 Background Energy Information

The Consumption figures for the buildings on a consumption per day basis are as follows:

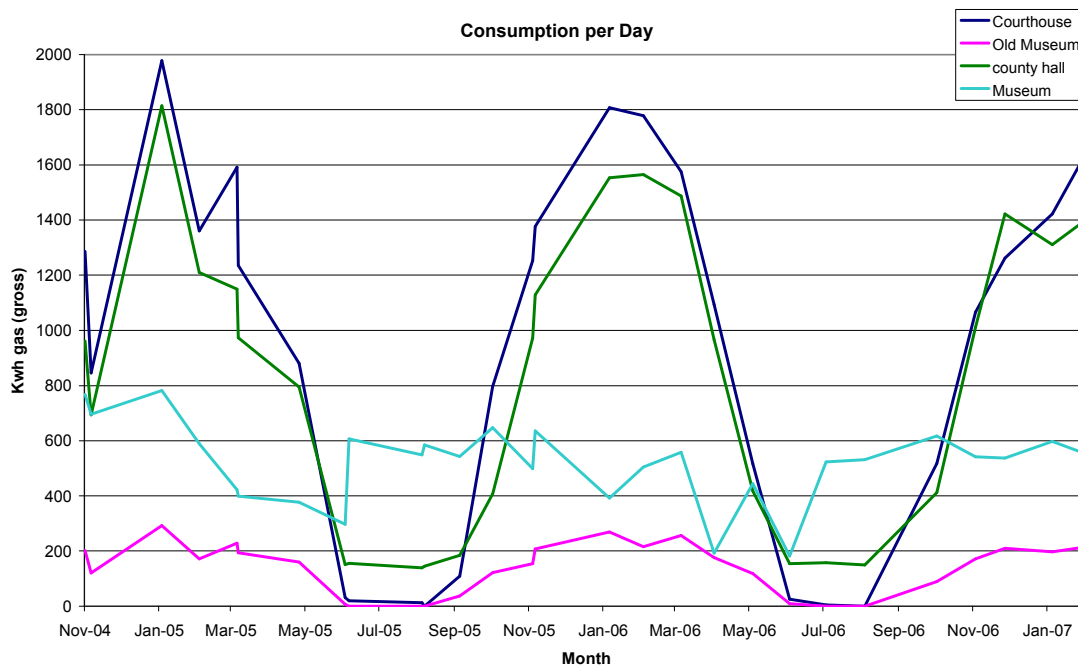
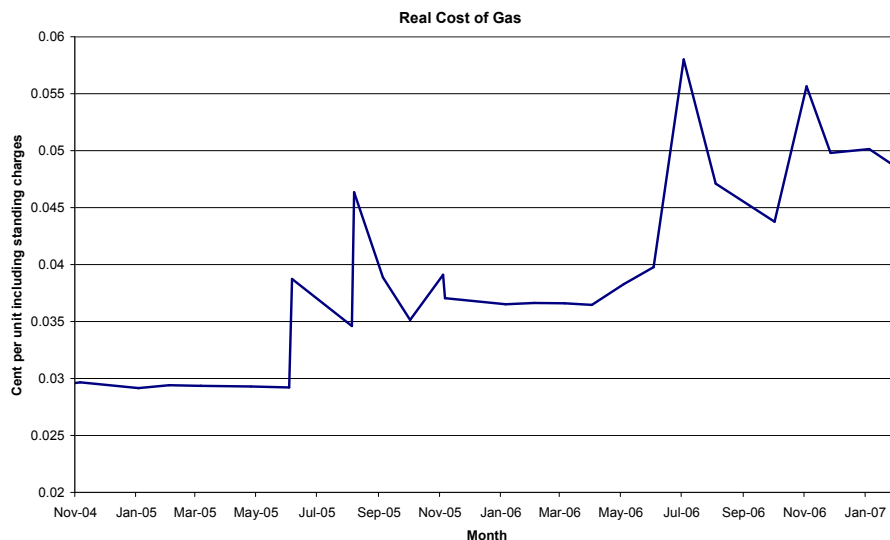


Figure 1: Gas consumption per day.

The Overall consumption figures per day based on the gas bills. These figures show a continued heating requirement for the Museum, some of which is required for the exhibits to be kept at constant temperature.



### 3.2 Energy Data Analysis

First of all the data was cleaned to kwh per day. This allowed the bill duration variation, and cost differences to be screened out. Then the Data was compared from a base line month before the optimiser was installed to a base line month after installation. This was done for each of the buildings to ensure usage patterns were independent of external climatic conditions. The usage of gas per day in November 2004 to November 2005 and November 2006 was compared to give an index. This index was greater than 1 if there was more gas used and less than one of there was less gas used.

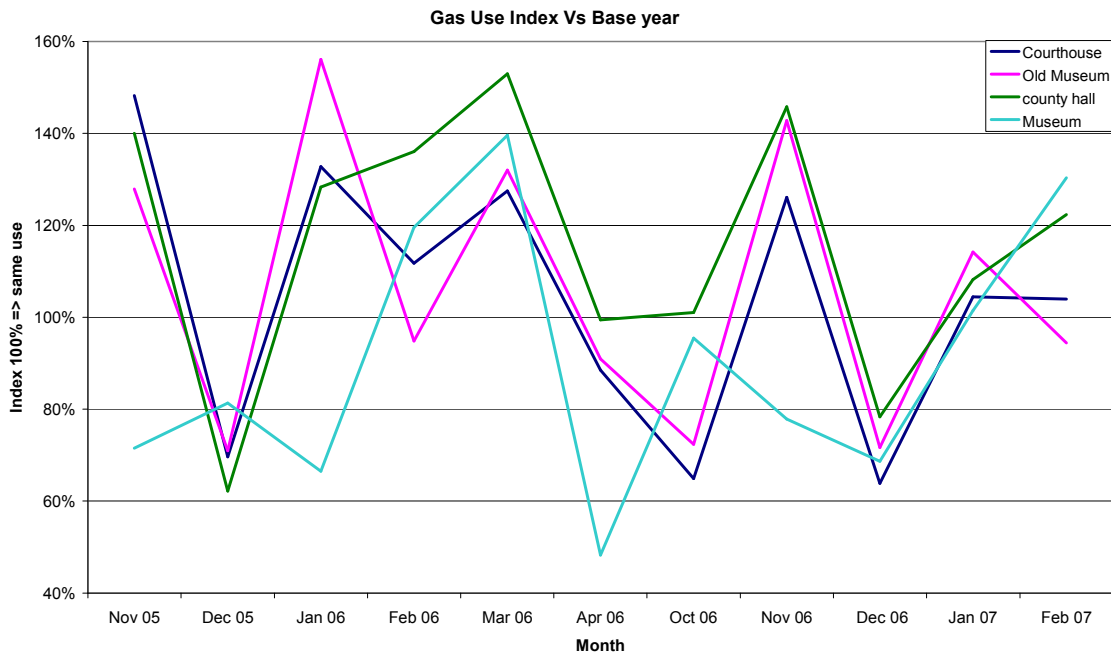


Figure 3: Gas Use Index Vs Bas Year

The clear detail in the figure 3 is that the museum is almost towards always at the bottom of the index chart. The overall index numbers are below.

County Hall	119%
Old Museum	110%
Courthouse	109%
Museum	94%

Figure 4: yearly use index Vs base year

Assumptions made:

1. No other major factors were significant in changing energy usage in the buildings
2. Gas usage data was correct on bills and smoothed out for estimated bills
3. Overall index numbers in figure 4 are weighted by gas use month (December contributes more than June)
4. Index months are excluded for May to September

### 3.3 Cost Analysis

This particular unit cost €1,425 including Vat @21% installed. The full price for that unit is €3,025 inc. Vat. The 1s unit was heavily discounted in order to get a lead in with South Tipperary County Council. The cost analysis will be duplicated with full market price to ensure that it is relevant to future purchasing decisions.

Month	Units Saved	Units W/Out Optimiser	Units With Optimiser	Ave cost per unit	Cost W/Out Optimiser	Cumulative W/Out optimiser	Cost With optimiser	Cumulative With Optimiser	Savings With Optimiser
Nov-05	3124	19566	16442	0.0391	765	765	2068	2068	-1303
Dec-05	4227	26473	22246	0.0371	981	1746	824	2892	-1146
Jan-06	2085	13060	10975	0.0365	477	2223	401	3293	-1070
Feb-06	2685	16813	14129	0.0366	616	2839	517	3810	-972
Mar-06	3282	20559	17276	0.0366	752	3591	632	4443	-852
Apr-06	988	6185	5198	0.0365	226	3817	190	4632	-816
May-06	2701	16917	14216	0.0383	648	4464	544	5177	-712
Jun-06	1036	6489	5453	0.0398	258	4723	217	5393	-671
Jul-06	2980	18663	15683	0.0580	1083	5805	910	6303	-498
Aug-06	3230	20227	16998	0.0471	953	6758	801	7104	-346
Sep-06	4108	25728	21620	0.0464	1193	7951	1002	8106	-156
Oct-06	2580	16158	13578	0.0438	707	8658	594	8701	-43
Nov-06	3297	20649	17352	0.0557	1149	9807	966	9666	141
Dec-06	2446	15321	12875	0.0498	763	10570	641	10308	263
Jan-07	4430	27743	23314	0.0501	1391	11962	1169	11477	485
Feb-07	3030	18977	15947	0.0484	919	12881	772	12249	632

Figure 5: Cash flow analysis with and without gas optimisers.

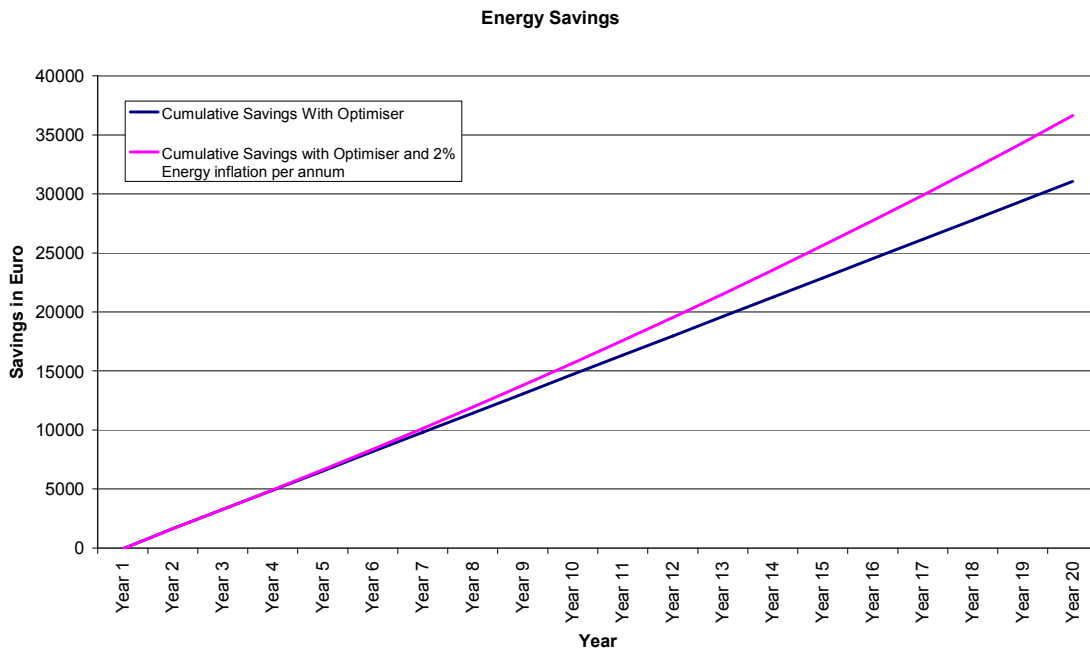


Figure 6: Projected future savings

	<b>Discounted investment</b>	<b>Full investment</b>
Investment	€1,425	€3,025
NPV (5%,20yrs) of savings	€18,813.53	€17,289.72
IRR (20yrs)	106%	52%
Average annual savings	€1,634	€1,634
Simple payback	13 Months	24 Months

Figure 7: Summary Financial Numbers

In order to ascertain the possible savings available, a cost analysis was done on three other buildings in the council's remit.

	NPV (20yrs 5%)	IRR (20Yrs)	Simple Payback
County Hall	€27,402.22	80%	1.25 years
Court House	€29,919.59	87%	1.15 years
Old Museum	€2,116.39	12%	8.5 years

Figure 8: Cash flow analysis for other county buildings

## **4 Conclusions**

The Gas optimisers save up to 20% of the gas used in boilers. They are expensive, but the cost is paid back in a very short time. It is fairly conclusive that the optimisers save a significant amount of money over the life time of the boilers.

## **5 Recommendations**

1. Install Gas optimisers in the County Hall and the Courthouse before the next winter season starts.
2. If the Old museum is to be in continuous use over the next 20 years, without significant upgrading/ changing then a gas optimiser should be installed.
3. Optimisation of the Borough Council, the Town Swimming pool and any other building whose gas bill exceeds €2,500 per annum should be investigated.