

# Ashtead Squash and Tennis Club Energy Consultation

---

**Prepared For:**

**Tony Cooper and George Gregory**

**Prepared By:**

**Philip Gauthier, Anthony Gianfrancesco, Jillian Morang, Zhongjie Wu**

**20/04/11**



## 1. Introduction

The purpose of this energy consultation was to discover potential areas of energy reduction and savings within the Ashted Squash and Tennis Club building in Ashted. This consultation was conducted using a questionnaire and check list during a walk-through, with supplementary data on past gas and electric usage. The Club has three courts for playing squash inside its perimeter. There is also a fully functioning area for catering events, which includes a kitchen and pub.

The energy consultation, analysis, and report were completed by four American university students, for a project requirement for Worcester Polytechnic Institute. These students are working with the Mole Valley District Council to help reduce the carbon emissions of small and medium enterprises in the Mole Valley.

**Notice:** While there has been an effort made to ensure that the information contained in this report is accurate, it should be taken into consideration that some of the information may be incomplete, inaccurate, or become out of date. Therefore, Mole Valley District Council, Worcester Polytechnic Institute, and all associated persons do not provide any guarantees on the information provided in the following report.

## 2. Action Plan

The recommendations listed below are prioritized by payback period and estimated costs. Further explanations of each recommendation are provided.

Priority	Recommendations	Estimated Annual Savings			Estimated Costs (£)	Payback Periods (years)
		(£)	CO <sub>2</sub> (Kg)	(kWh)		
1	Behavioural Changes	---	---	---	---	---
2	New Lighting	403	2,198	4,032	947	2.35
3	Envelope	6	108	200	50	8
<b>Total</b>		409	2,306	4,232	997	2.43

### 3. Energy Savings

#### a. Priority 1: Behavioral Changes, No Cost Solutions

**Make sure that all radiators are unobstructed and kept on appropriate settings.** Obstructed radiators are forced to work harder to heat a room resulting in higher energy usage. Also a radiator that is left on its maximum setting will never turn off and over heat a room. Keeping radiators unobstructed and at a setting of 3 to 4 you will save energy and money.

##### **Site Specific Examples:**

- The radiator in the vestibule has a rubbish bin resting against it. Consider placing the basket in another area to allow for maximum heat flow.



## b. Priority 2: Energy Efficient Lighting

**Replace existing lights in the facility with newer lights.** Many old lighting elements have become inefficient over the years. Replacing the existing elements with LED equivalents allows you to save significant amounts of money on your energy bill. If LED bulbs are not a viable option at the current time then CFL and fluorescent tubes can be used but make sure that the most efficient ones are in use i.e. T8 or T5's for fluorescent tubes and bulbs with high energy ratings of A or B should be used. The table below breaks down the recommended areas where lighting should be replaced with all the correlating information about payback periods and costs.

### Site Specific Examples:

- All halogen spotlights can be replaced with lower wattage lighting where possible. LED lights are also dimmable, so they will work with the current fittings. The calculations below do not include the 50 Watt halogen GU-10 spotlight fittings.

Old Light Bulb Wattage (W)	New Bulb Type	New Light Bulb Wattage (W)*	Price per New Bulb (£)*	Number of Bulbs Replacing	Total Bulb Costs	Savings per Year (£)	kWh Saved per Year (kWh)	Payback Period (years)	CO2 Savings per Year (Kg of CO2)
60.00	LED R63	5.00	36.00	24.00	864.00	355.00	3,548	2.43	1,935
40.00	LED R50 E14	4.00	17.00	5.00	85.00	49.00	484	1.75	264
Totals				29.00	949.00	404.00	4,032	2.35	2,199

\*All calculations are based off of pricing and wattage from NET LED

\*\*If you do not know the average price of your electricity use .1 £

\*\*\*Based off an estimated £4 instillation cost per bulb. Professional quotation should be acquired.

### c. Priority 3: Building Envelope

**Increasing the building envelope keeps inside air separate from outside air and therefore save energy.** Exterior doors and windows can be improved with very low monetary investment. Instead of purchasing new windows, make the old ones work in a more efficient manner.

#### Site Specific Examples:

- The windows that surround the building can be more efficient with the aid of window insulation film. Specifically convection control film which cuts down the amount of heat lost from the inside of the building. It can also prevent window condensation, another reason for heat loss.

#### Estimated Values

Number of Windows (Approx)	kWh Saved per Window per Year	Total kWh Saved per year	Total CO <sub>2</sub> saved per year (kg)	Total Savings (£)
50	4	200	108	6

- The squash courts, specifically Court 1 with its three exterior walls, should be isolated from the first and second floor lounge area. This can be done by adding rubber seals to the upper and side thresholds of the door and a rubber skirt to the bottom. These seals will stop cold air from infiltrating the heated space.
- The front doors to the building and the lobby doors should have door skirts similar to the interior doors. The difference with the lobby doors is that there is a gap between the two doors in the middle. Side skirts can be added to ensure that cold air does not infiltrate the rest of the building.



- The exterior door in the beer storage room has a large gap under between the bottom of the door and the concrete threshold. Cold air can escape through this and cause wasted electrical energy. Consider sealing this door even more rigorously than the others due to the large amount of energy used in this room.



Item and where its located	Quantity	Est. Cost of Each Item	Est. Total Installation Cost	Marginal Energy Saving per item	Usage per Day	Days per Year	Unit Heat from Unit Electricity	Electricity or Gas Cost	Annual Saving	Cost of Product	Payback Period	kWh saved	Carbon Emission Reduction
Units =>	ea.	£	£	W	h	days	efficiency	£ / kWh	£	£	year	kWh	kg
Doors looking over Squash Courts	2	12	0	200	4	137	0.8	0.03	8.22	24	2.9	109.6	60
Exterior Doors	3	25	0	200	12	137	0.8	0.03	36.99	75	2.0	328.8	179
Interior doors	5	12	0	75	4	137	0.8	0.03	7.71	60	7.8	41.1	22
Thin film in kitchen	10	5	0	500	4	137	0.8	0.03	102.75	50	0.5	274	149
Total									155.67	209	1.3	753.5	411

## 4. Additional Considerations

These are items that should be considered to help increase energy savings.

### **Site Specific Examples:**

- When considering the use of motion sensors, first read the attached document, in Appendix A, which explains how purchasing energy efficient equipment can result in tax refunds.
- Contact the Lucozade vendors to see if a more energy efficient vending machine can be installed instead of the older model currently in place. Energy Star vending machines consume up to 15% less energy than the non-Energy Star model.

## 5. Brief Summary

In summary it can be seen that while this building is already doing very well in energy efficiency, there are still areas which can be improved to help reduce energy usage. Many of these steps are of a higher cost or more difficulty, but will be worth the change due to the amount saved on energy bills.



## Appendix A

### Enhanced Capital Allowance (ECA)

ECA allows for companies who are investing in energy saving technologies to receive a tax relief on their profits for the year based on the amount they spent on the energy saving technologies. This provide companies to have additional capital to be able to put energy saving equipment in that would normally be too expensive so that both the environment and the company are able to benefit quicker from their investments.

There are currently many energy saving technologies out there for the many different sectors of a business from lighting, to HVAC, to pipe insulation, to motors, etc. The technologies for these sectors can often provide great energy savings but can cost more than a business is willing to spend. The ECA then provides a company with additional capital so that they can benefit from the savings of the energy efficient technology.

**About ECA:** This link provides more information on why the ECA was started and some of the key features that it has.

<http://www.eca.gov.uk/etl/about/>

**How ECA works:** This link breaks down how exactly the ECA works and how much money a person may see from claiming an ECA.

<http://www.eca.gov.uk/etl/about/How+does+the+ECA+scheme+work.htm>

**Benefits of ECA:** This link provides more information how claiming an ECA can benefit a business from cash-flow boost and lower energy costs.

<http://www.eca.gov.uk/etl/about/Value+and+Benefit.htm>

**Finding Eligible Technologies:** This link provides the information on the various technologies that are currently out there that an ECA can be claimed for. <http://www.eca.gov.uk/etl/find/>

There are a few technologies that are not listed as they are very variable or too numerous in type. More information on how to check if the technology is eligible for a company to claim an ECA is provided in the link below. In many cases if a contractor is hired to complete the work they should be able to provide information on whether or not an ECA can be claimed.

<http://www.eca.gov.uk/etl/claim/non-listed.htm>

**Claiming an ECA:** This link provides information on how and where to claim an ECA.

<http://www.eca.gov.uk/etl/claim/>

## Appendix B

### Choosing the Right Electricity Company

This basic guide has been written in order to provide small businesses with a means to negotiate electricity prices. According to the figure below, gas prices and electricity prices are rising at an increasing rate. The figure shows average electricity prices from the company Powergen, one of the “Big 6” utility companies.

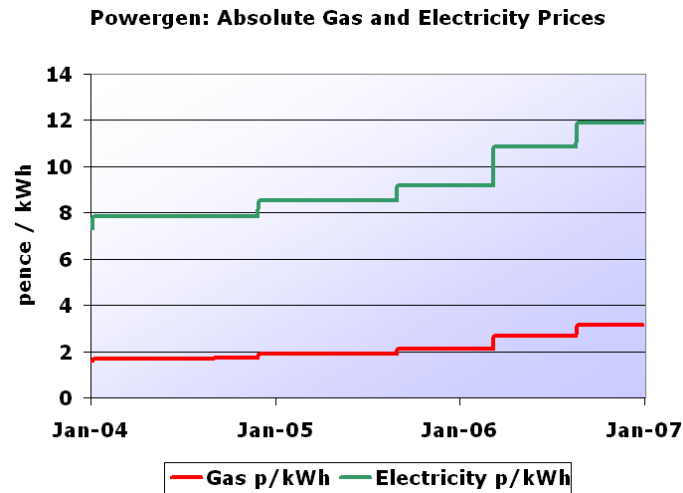


Figure 1: Quarterly comparison of electricity prices from Powergen

Though the plot only shows prices for Powergen, when one company increases their prices, the others usually follow in a relatively quick time period.

The worst way to pay for energy is through a **non-contracted agreement**, or **tariff rate**, with variable pricing for estimated units of electricity used. The best is a **contract** with a locked electricity rate for an agreed amount of time. Choosing the time period of the contract can be tricky because longer contracts will have a higher price per kilowatt hour (kWh) in an attempt to factor in the rising electricity prices. The most common advice is to go with the longer contract unless the price is significantly higher than the short-term rate.

There are two types of billing options for a contracted electricity agreement, these are **debit** and **quarterly** bills. Debit billing, usually the cheaper option, allows the energy user to pay a fixed rate every month, while quarterly billing allows the user to pay a variable bill, bill dependent upon energy use, every quarter.

These billing statements include two types of fees, the **price per unit** and the **standing price**. The standing price is a charge per day and can vary based on the electricity company, but should not be the major factor in making a decision. The price per unit is how much an electricity company charges for a kWh. Since not all energy companies raise their prices at the same time, shopping around is very important.

Energy companies will allow separate pricing for electricity used during the day and electricity used at night, provided the correct meter is installed. The best type of meter for such pricing is a smart meter, which takes half-hourly or hourly readings. **By the year 2020, all businesses will be required to have smart meters.** Usually these are not free but can be paid for through the standing charge. Since smart meters cost around £100, an increased standing charge of 30p a day will accumulate to a smart meter after one year. This smart meter will be purchased by the building owner and will belong to them, not the electricity company. The purchased meter can be used if the electricity company is changed, provided the new electricity company supports smart metering. Most of the “Big 6” electric companies support smart metering, be sure to ask upon calling. Most of these major electricity companies also do a combined gas and electricity bill. Be sure to ask if this lowers the price at which energy is purchased.

A list of the biggest electric companies has been provided below to facilitate comparative pricing.

Company Name	Phone Number
E.ON	0800 051 5517
Powergen	0800 051 0760
British Gas	0800 480 0202
EDF	0845 366 3664
Scottish and Southern Energy	0808 156 0056
Npower	0845 270 0926
Scottish Power	0800 980 2476

A list of impartial websites for advice on finding a cheaper company or energy saving advice is also provided.

Website Name	Website Address
Consumer Focus: Energy Watch	<a href="http://www.energywatch.org.uk/">http://www.energywatch.org.uk/</a>
Surrey Business Link	<a href="http://www.businesslink.gov.uk/south_east.html">http://www.businesslink.gov.uk/south_east.html</a>

After research on comparative prices has been done, a free energy consultant can be contacted. They will find the cheapest electricity available and use the prices you found to possibly find better deals.

Company Name	Phone Number
Business Advisory Service	0845 180 0700
Blue Mark Consultants	0800 987 5505
Quaestor Cost	0800 970 0432