

Park House Energy Consultation

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1. Introduction

The purpose of this energy consultation was to discover potential areas of energy reduction and savings within the Park House building. This consultation was conducted using a questionnaire and check list during a walk-through, with supplementary data on past gas and electric usage. The Park House building is home to 24 hour Telecare Service call centre. Due to its 24 hour use, certain savings are limited there are still many ways to save electricity in this building.

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accurate, it should be taken into consideration that some of the information may be incomplete, inaccurate, or become out of date.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 ₂ (Kg)	(kWh)		
1	Behavioural Changes	-	-	-	Minimal	Immediate
2	LED Lighting	800	4180	7670	2400	3.0
3	Envelope and Door Insulation	40	1360	2500	200	5.2
4	Thin Client Computers	230	170	310	1400	6.2
Total		1070	5710	10480	4000	3.7

3. Current Use and Potential Savings

This is a breakdown of your current costs and what your expected cost may be with these recommendations.

Utility	Energy Consumption		Costs		CO ₂ Emissions	
	kWh/year	%	£/year	%	CO ₂ (Kg)	%
Electricity	52,276	59	5,769	82	28,502	81
Gas	35,897	41	1,252	18	6,649	19
Total	88,173	100	7,021	100	35,151	100
Projected Energy Consumption		% Savings	Projected Savings (£/year)	% Savings	Projected CO ₂ Emissions (Kg)	% Savings
			5,951	15	29,441	16

4. 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 not 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:

- In last upstairs office the desk is located in front of the heater. This room should be rearranged to leave the heater as unobstructed as possible.
- In the staff room the chairs were placed in front of the heater. Pull the chairs away from the heater and put up the attached sign to remind employees that they shouldn't block the heater.
- Some heaters were set much higher than necessary. Check them to be sure they are not set above four.

Turn off lighting and electrical equipment when it is unnecessary. Lights and equipment that are left on when they are not in use consume unnecessary energy. Putting signs up reminding people to turn lights and equipment off when leaving a room will help to save energy. See attached examples on signs to turn off lights.

Site Specific Examples:

- Be sure that the lights in unoccupied rooms are always switched off.
- Try to use more natural light, whenever possible. Open the shades in office areas (specifically second office upstairs) and turn off the lights during the day.
- Create maintenance schedule for cleaning skylights, to maximize their use.
- Turn off switches on electrical outlets or unplug all items when they are not being used, to avoid using power for items that are not on.
- The upstairs offices may be over lit and taking out one of the two T8 fluorescent tubes per fixture in these areas should be considered, though a light test should be conducted at night to determine this.

b. Priority 2: LED 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.

Site Specific Examples:

- All fluorescent lights should be replaced with lower wattage LED light tubes.

Old Light Bulb Wattage (W)	New Bulb Type	New Light Bulb Wattage (W)*	Hours Worked Per Year	Number of Bulbs Replacing	Price of Electricity (£)**	Total Bulb Costs*	Total Costs Including Labour**	Savings per Year (£)	kWh Saved per Year (kWh)	Payback Period (years)	Payback Period Including Labour Costs (years)**	CO ₂ Savings per Year (Kg of CO ₂)
58	LED	22	1,920	20	0.10	1,118	1,198	144	1,382	7.8	8.3	754
58	LED	22	61,320	20	0.10	1,118	1,198	656	6,290	1.7	1.8	3,429
			Totals	40	---	2,236	2,396	800	7,672	2.8	3.0	4,183

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

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

c. Priority 3: Envelope and Insulation

Doors that protect rooms from different temperature air should have rubber seals and skirts.

Doors that are not insulated will cause drafts in a building resulting in the heating and cooling to work harder to maintain the buildings temperature.

Site Specific Examples:

- The cleaning room door already has a skirt, but the rubber seals need to be replaced.
- Main entrance to building is extremely leaky and requires a skirt and rubber seal around all edges of the door and its extended opening.
- All other exterior doors should be insulated with a rubber seal, to protect against the loss of heat in the building.
- The door to the air conditioned server room, the interior door between the meeting room and main corridor, and the door to the electrical room should have skirts as well as the rubber seal installed.
- The storage closet door, between the two toilets, has a vent which large amounts of cold air can escape through into the heated corridor. This room originally housed showers, but was converted to a storage closet and the vent was never removed, though it is no longer necessary.
- The door to access the LTHW boiler, in the kitchen, does not close properly. This door should be fixed, so that it closes tightly to better insulate and improve the efficiency of the boiler.
- We were not able to enter all of the rooms (meeting room) and doors to these areas should be inspected and insulated as appropriate.

Heated pipes that are in colder areas and are not insulated lose heat. Insulating these will save money on heating bills, as the system will not have to work as hard to maintain the temperature as it moves through the piping.

Site Specific Examples:

- There are heated pipes in the air conditioned server room which are not insulated and should be. This causes the air conditioning in the room as well as the heating for the building to work harder.

d. Priority 4: Thin Client Computers

The office's desk top computers should be switched to newer, more efficient IGEL Thin Clients.

IGEL Thin Clients use at least 50% less energy than a standard desktop computer. Replacing them in appropriate situations can result in high savings.

Site Specific Examples:

- The office already has and uses the Thin Client server, installing the Thin Client unit would cause minimal disruption.
- Computers in reception and offices do not use any technical programs that would require more than the IGEL offers. There are seven computers of this type.

- Twenty-four hour service computers will not be changed. There are six computers of this type.
- IGEL Thin Client computers consume much less energy than the currently used desktop computers.

e. Small Notes

The following changes will help with energy savings but may not save as much as the above suggestions. Some of the suggestions may be more likely to be considered when other renovations occur in the building.

Site Specific Examples:

- When the building's carpeting is replaced consider buying brighter colors, to optimize incoming natural light and inside lighting.
- Consider putting in a smaller hot water tank. The current tank is larger than it needs to be, as there used to be a shower in the Park House building.

5. Brief Summary

In summary it can be seen that there are a number of ways to save energy for this building. Many of these savings are from behavioral changes such as making sure people turn lights off, having radiators not be obstructed, and having radiators on appropriate settings. Other changes require some capital but can result in great savings such as the LED lighting, which can save £800/year. Taking these steps and more will help to reduce your energy bill and save you money.