RESTRICTED
- COMMERCIAL -

Energy Management Report For St Paul's Art Centre, Worthing



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EXECUTIVE SUMMARY

This report presents the results of an Energy Survey of the St. Paul's Art Centre building on behalf of Transitions Town Worthing for St. Paul's Art Centre by Green Age.

The objectives of this site-specific report were to:

- **Identify no-cost or low-cost measures that could be introduced quickly at the site surveyed (either by way of changes in on-site procedure or low cost material changes).**
- **Identify potential areas for medium to high cost measures that require further investigation and/or feasibility studies.**
- **Identify issues relating to energy policy and monitoring**

Using average energy consumption and cost data provided by staff at St. Paul's Art Centre it has been estimated that the Centre consumes approximately 148,600 kWh of energy per annum costing an estimated total of £8,245, and producing 44 tCO_2 (tonnes of carbon dioxide emissions). Breaking this down, this eqautes to around 58,600 kWh of electricity and 90,000 kWh of gas (100 kWh/m^2 and 153 kWh/m^2). The Centre can be compared against CIBSE benchmarks (please see page 6).

Following the site survey, an Action Plan has been provided in section 3, which outlines the recommended actions that the site could adopt in order to reduce energy consumption and minimise waste. Additional actions have also been identified that may require further investigation to assess their viability before being implemented. The measures shown in the Action Plan are detailed in section 2 of the report, with calculations and assumptions in Appendix 2.

Estimated Energy & Cost Savings

If the measures in the action plan are implemented, the aggregated estimated savings represent a 21% reduction in energy consumption and a 48% reduction in cost, equivalent to an annual saving of £3,932. The cost of implementing the package of measures is estimated to be £33,314 giving a simple payback period of between 8.5 and 11.5 years (please see page 18 regarding the payback).

Please note that the implementation of some of the energy saving measures will impact on the savings that can be achieved by other recommendations. This means that there might be a degree of duplication of savings if all the measures are implemented.

Estimated Carbon Savings

The estimated carbon emission reductions from implementing the recommendations would be 13.3 tCO_2.

1. INTRODUCTION

1.1. Survey Details

This survey was carried on behalf of Transition Towns Worthing for the St. Paul's Art Centre, in March 2016 by Firooz Firoozmand from Green Age. The survey was only feasible due to, the assistance of staff from St Paul's Art Centre, Worthing.

1.2. Site Background

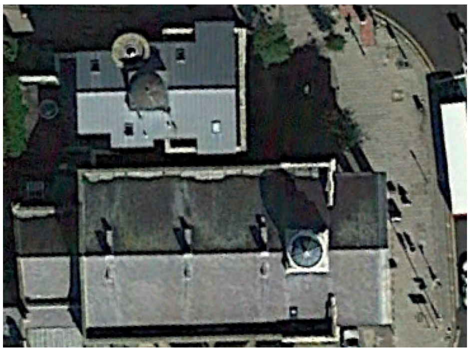
The St. Paul's Art Centre site is located in the centre of Worthing. The building, originally known as the Worthing Chapel of Ease, was first opened in 1812 and was extended in the 1890's. The gross internal floor areas (GIA) of the building was not available and therefore Google Earth has been used to estimate the GIA. The Centre is estimated to have a GIA of 587 m^2.

The building is a Grade II listed building and is of solid brick construction with cement rendering on the front section of the façade (as shown in the photograph here). The yellow bricks used in the construction were sourced locally, from Worthing. The building has predominantly pitched roof spaces and has a bell cupola towards the east side of the building; anecdotally, the loft spaces are well insulated. It has single pane glazing throughout the majority of the building, some of the glazing is stained glass. The Herridge room, on the north side of the Centre is fitted with double-glazed windows.

The building was closed on 1996 because of issues with the roof; it was eventually re-opened as the Worthing Art Centre. It is now the town's largest multi-arts venue and bar. The building is used for a range of activities which include theatre, exhibitions, workshops and craft markets. The building is predominantly used as a café and is open 6 days a week, Monday to Saturday between 08:30 and 16:30 (48 hours per week).

The Centre has a gas-fired boiler plant (2 Keston, 40 kW boilers, shown in the photograph to the left) that were installed in around 2009. The heating plant is located in the basement and these supply LPHW (Low Pressure Hot Water) to radiators throughout the Centre building. There is also supplementary electric heating. Anecdotally there is also an underfloor system installed, however this was decommissioned several year's back.

The Google Earth image below, shows the St. Paul's Art Centre (circled here). The section of building to the north of the Centre (outlined with a white line) is being used as an apartment block.



1.3. Energy Consumption Overview

The St Paul's Arts Centre consumes approximately 148,600 kWh of energy per annum, costing a total of £ 8,245. This comprises:

Utility	Energy Consumption		Cost		CO_2 Emissions	SEC Floor Area
	kWh/year	%	£/year	%	tCO_2	kWh/m²
Electricity	58,600	39%	5,913	67%	27	100
Gas	90,000	61%	2,332	33%	17	153
TOTAL	148,600	100%	8,245	100%	44	253

CO_2 emissions are calculated on the basis of 0.462 $kgCO_2$/kWh for grid electricity and 0.184 kg CO_2/kWh for gas. The cost has been calculated using the Centre energy tariffs. The unit cost used for the Centre is 10.09 p/kWh and 2.591p/kWh for electricity and gas respectively, in both cases excluding VAT and standing charges.

Using the estimated energy cost attributable to the Centre (£8,245), it is estimated that the cost per hour of using the building is £ 2.83 per hour (£8,245/52 weeks/56/hrs/week).

1.4. Objectives

The objectives of this site-specific report were to:

- Identify no-cost or low-cost measures that could be introduced quickly at the site surveyed (either by way of changes in on-site procedure or low cost material changes).
- Identify potential areas for medium to high cost measures that require further investigation and/or feasibility studies.
- Identify issues relating to energy policy and monitoring.

1.5. Benchmarks

Energy performance indicators give a measure of activity based energy use, which can be compared with equivalent benchmarks. Energy consumption benchmarks are published in Carbon Trust Good Practice Guides and within the CIBSE Energy Benchmark document TM46 for different buildings. The CIBSE document TM46 includes the benchmarks used for the generation of Display Energy Certificates (DECs). These benchmarks are provided for various non-domestic buildings and therefore the analysis below is in relation to the Centre building only.

The GIA of the Centre building is estimated to be 587 m^2. Based on estimated energy consumption and cost data provided by staff at the Centre, the energy consumption for the Centre building in kWh/m^2 is estimated to be as follows with the benchmark comparison also shown:

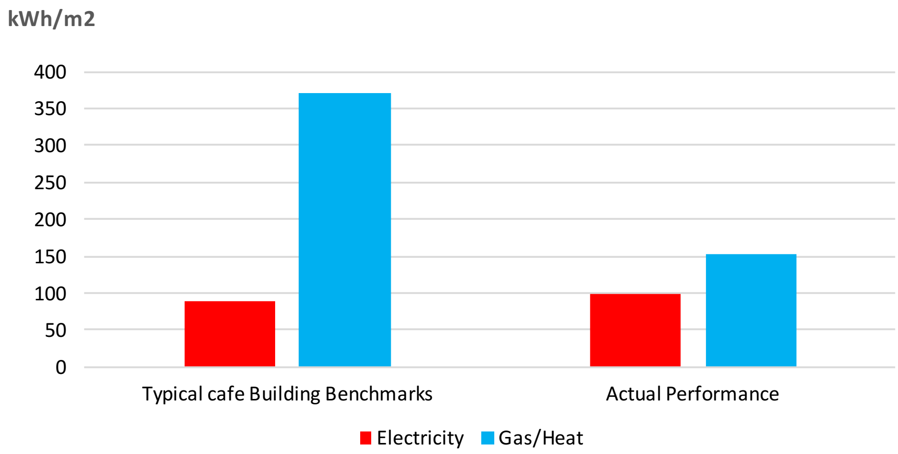
Arts Centre Building

Electricity consumption	**100 kWh/m^2**
Gas consumption	**153 kWh/m^2**

Typical Restaurant (Café) Benchmarks

Electricity consumption	**90 kWh/m^2**
Gas consumption	**370 kWh/m^2**

The chart below shows the actual energy performance at the Centre compared with these energy benchmarks. The 'restaurant' CIBSE benchmark has been used here, and cafés are considered representative here.



This shows that around 11% more electricity is being used compared to a typical building and this is worthy of further investigation. From a gas perspective, less gas, around -59% is being used when compared to the benchmark.

2. RECOMMENDATIONS

The assumptions and calculations used for these measures are shown in appendix 2.

Measure 1	**Consider installing a photovoltaic (PV) array on roof areas**			
Cost Saving £ per year	**CO_2 Savings Tonnes per year**	**Energy Savings kWh per year**	**Cost £**	**Payback Years**
2,868	8.4	18,126	30,100	10.5 *

Detail

Consider installing photovoltaic panels on the roof spaces above the Centre building (roof spaces at a higher level that would be less in public view).

*Note the payback shown above increases to 16.5 years if the £ 1,039 FIT and export tariff are excluded. This is for illustrative purposes in the event the government removes the various tariffs.

Rationale

Consideration could be given to installing PV on the following areas. However, this would need to be further investigated:

1.The south facing section of the central pitched roof (Above the café, hall area).

An estimate of available roof area has been calculated below, using Google Earth:

Location	Estimated area (m^2)	Peak load	Estimated cost (£)
1	136	21.2	29,645
TOTAL	136	21.2	29,645

Based on these estimates installing PV on this roof area would generate a potential peak load of around 21.2 kWp. (this is assuming each panel has a potential peak load of 250Wp and that each panel has an area of 1.6m^2)

However, it may be best to size the array according to the summer time electrical base load of the site. As there is no data available, using the estimated electricity consumption of the Centre it can be estimated that the daily electricity consumption of the Centre would be around 161 kWh/day (58,600 kWh/365 days).

If we assume that there is plant and equipment operating at various times during a 17[1] hour day, 7 days a week, then the daily average demand during this period is estimated to be around 9.5 kW.

The average demand is an estimate; consideration should be given to connecting a data logger to the site electricity meter supply over the summer in order to accurately identify the summer time electrical load on which to base the correct sizing for the PV array.

Not all of the electricity consumption (58,600 kWh) can be generated by the PV array, as electricity will be consumed when it is dark outside. Using sun hour data, it is estimated that the building would consume around 18,126 kWh of electricity per year during these sun hours (9.5 kW x 1,908 sun hours/year).

The Government's Standard Assessment Procedure (SAP) for Energy Rating of Dwellings provides a

[1] 17 hours representing the on-peak tariff period

	methodology to calculate the expected electricity output from a PV panel. The calculation they use is: $0.8 \times kW_p \times S \times Z_{pv}$ *(S = annual solar radiation; Z_{pv} = the overshading factor)* It is therefore estimated that a typical solar panel will generate 211 kWh/year. Therefore, in order to generate 18,126 kWh, 86 panels are required and this relates to a power output of 21.5 kWp (86 panels x 0.250 kWp/panel). Thus if a 21.5 kWp array were to be installed, then the estimated cost of the arrays would be £ 30,100 (21.5 kWp x £1,400). This is based on estimated costs of £1,400 per kWp if using mounting brackets. Therefore, assuming a 21.5 kWp installation, the estimated savings are shown below. **Annual FIT Contribution - £ 1,039** The current FIT rates for installations between 4 and 50kWp is 5.73p/kWh[2]. Assuming an annual electrical output of kWh, this would result in an annual FIT contribution of around £ 1,039 (18,126 kWh x 5.73 p/kWh - this is assuming the low tariff). **Annual Export Tariff - £0** As the current annual electricity consumption of the Centre is around 58,600 kWh, it is assumed that the entire portion of the electricity generated by the PV installation (18,126 kWh) will be used by the Centre. **Annual Cost of Electricity Saved - £ 1,829** The estimated current cost of electricity is assumed as 10.09p/kWh and hence the annual saving as a result of the proposed installation is £ 1,829 (10.09p/kWh x 18,126 kWh). Therefore, it is estimated that the total annual benefit from installing such a PV array would be £ 2,868. The calculations above are estimated using Google Earth and using approximate costs. In addition, a feasibility study needs to be carried out in order to provide a more accurate idea of the electricity generation potential here. It should also be noted that if the lighting load of the building is reduced as per measure 2, then this will have an impact on the peak load and thus the size of photovoltaic installation required. In fact, efforts should be made to reduce the energy demand on site before considering a PV installation. Again, the electrical demand of this area would need to be investigated.
Risks	Ensure that a PV feasibility survey of the site is conducted so that more accurate calculations can be made Ensure that a structural survey is conducted and wind loading is reviewed Investigate any planning issues that may arise Ensure that there is suitable access for the installation of the PV arrays
Next Step	Instigate a PV feasibility survey, consider acquiring 3 separate quotes for comparative purposes.

[2] The lower FIT tariff has been assumed here, however if an EPC were commissioned and the EPC for the Centre building shows its energy efficiency in bands A to E then the higher rate FIT of 10.9p/kWh is currently applicable.

Measure 2	Consider replacing high wattage lights with LED alternatives			
Cost Saving £ per year	**CO_2 Savings Tonnes per year**	**Energy Savings kWh per year**	**Cost £**	**Payback Years**
817	3.7	8,094	3,214	3.9
Detail	During the survey several lights were observed that could be replaced with LED equivalents which will help reduce the electricity consumption attributable to the lighting.			
Rationale	For illustrative purposes a breakdown of the potential savings in relation to some of the lights is			

shown here. It was not possible to access every light and therefore where necessary an estimate of wattage has been made.

***Café section** (including the square, kitchen, lobby and lavatories)*

Existing			Recommended Replacement		Difference in power rating (kWh)
No of lamps	Wattage (W)	Estimated power rating (kWh)	Wattage (W)	New estimated power rating (kWh)	
13	28	0.36	12	0.16	0.20
14	70	0.98	50	0.70	0.28
5	36	0.18	15	0.08	0.10
17	58	0.99	20	0.34	0.65

If it is assumed that these lights would be left switched on for around 91 **hours per week,** 52 **weeks of the year, then converting them to LEDs will result in an annual saving of** 5,821 **kWh (**1.23 **kW X** 91 **hrs/week X 52 weeks).**

***Stage** (stage lights)*

Existing			Recommended Replacement		Difference in power rating (kWh)
No of lamps	Wattage (W)	Estimated power rating (kWh)	Wattage (W)	New estimated power rating (kWh)	
4	500	2.00	30	0.12	1.88

There are currently plans to replace the stage lighting. Anecdotally around 4 of the stage lights are used around 10 hours/week. If it is assumed that these lights would be left switched on for around 10 hours per week, 52 weeks of the year, then converting them to LEDs will result in an annual saving of 940 kWh (1.88 kW X 10 hrs/week X 52 weeks).

Herridge Room

Existing			Recommended Replacement		Difference in power rating (kWh)
No of lamps	Wattage (W)	Estimated power rating (kWh)	Wattage (W)	New estimated power rating (kWh)	
28	18	0.50	6	0.17	0.33

If it is assumed that these lights would be left switched on for around 10 **hours per week, 52 weeks of the year, then converting them to LEDs will result in an annual saving of** 1,030 **kWh (**0.33 **kW X** 60 **hrs/week X 52 weeks).**

Entrance area

Existing			Recommended Replacement		Difference in power rating (kWh)
No of lamps	Wattage (W)	Estimated power rating (kWh)	Wattage (W)	New estimated power rating (kWh)	
2	28	0.06	12	0.02	0.04

If it is assumed that these lights would be left switched on for around 10 **hours per week, 52 weeks of the year, then converting them to LEDs will result in an annual saving of** 204 **kWh (**0.04 **kW X** 98 **hrs/week X 52 weeks).**

Back entrance area

Existing			Recommended Replacement		Difference in power rating (kWh)
No of lamps	Wattage (W)	Estimated power rating (kWh)	Wattage (W)	New estimated power rating (kWh)	

1	28	0.03	12	0.01	0.02

If it is assumed that these lights would be left switched on for around 10 hours per week, 52 weeks of the year, then converting them to LEDs will result in an annual saving of 67 kWh (0.02 kW X 80 hrs/week X 52 weeks).

Vestry

Existing			Recommended Replacement		Difference in power rating (kWh)
No of lamps	Wattage (W)	Estimated power rating (kWh)	Wattage (W)	New estimated power rating (kWh)	
2	28	0.06	12	0.02	0.04

If it is assumed that these lights would be left switched on for around 10 hours per week, 52 weeks of the year, then converting them to LEDs will result in an annual saving of 32 kWh (0.04kW X 15 hrs/week X 52 weeks).

Regardless of how efficient lamps are, energy is being wasted if lights are on when they are not required. There are various types of control available to help maintain correct lighting levels and provide optimum light output whilst minimising energy consumption, these include; PIR motion controls and daylight sensors. However, it will prove cost effective to continue to ensure that lights are turned off by way of an awareness raising campaign.

Risks	Personal need and H&S must be considered primarily. It should be noted that a simple payback calculation has been used here and it relates to a like for like swap. Additional costs may be incurred if rewiring is required.
Next Step	Looking into the opportunities for replacing high wattage lights with lower wattage LED lights. Roll out an awareness raising campaign targeting lighting.

Measure 3	**Implement Staff Energy Awareness Training and Shutdown Procedures.**			
Cost Saving £ per year	**CO_2 Savings Tonnes per year**	**Energy Savings kWh per year**	**Cost £**	**Payback Years**
82	**0.4**	**1,486**	**N/A if carried out in house**	**N/A if carried out in house**

Detail	It is suggested that staff are trained on understanding: which pieces of equipment use up the most energy, the cost and CO_2 savings potentials, the link to climate change and what they can do to reduce the energy consumption within the buildings. Everyone on site should be informed of the energy policy and energy procedures (please see appendix 2 for an example template of an Energy Policy)
Rationale	It is estimated that savings of 1% of electricity and 1% of gas consumption can be realised by the provision of energy awareness training and written shutdown procedures. A survey of what equipment should be turned off when not in use during normal operating hours should be carried out and all switches labelled accordingly. This survey should be carried out with a nominated “energy champion(s)” as to ensure their involvement. The idea is to ensure that the staff at St. Paul’s Art Centre have ownership of the energy

	consumption in their area and that they feel responsible for this consumption. The use of posters and stickers should further help raise awareness. Ensure that everyone on the site is aware that they can influence energy savings.
Risks	Time is taken up with training.
Next Step	1. Initiate energy awareness training. 2. Make an inventory of what equipment needs to be shut down. 3. Initiate appropriate shut down procedures and labelling of equipment and all switches. 4. Monitor the progress. 5. Complete refresher training on a regular basis.

Measure 4	**Formulate, implement and publish a formal Energy Policy and determine an Energy Strategy**			
Cost Saving £ per year	**CO_2 Savings Tonnes per year**	**Energy Savings kWh per year**	**Cost £**	**Payback Years**
82	0.4	1,486	N/A if carried out in house	N/A if carried out in house

Detail	Formulate a policy for energy efficiency and make sure that everyone is committed to it. If the Centre is committed to reducing energy consumption on site, then the development of an Action Plan and the publication of an energy policy will help to achieve this goal. Actions taken by the Centre to reduce energy consumption and the results achieved should be published via notice boards to assist in improving the levels of awareness at the site. It is estimated that savings 1% of electricity and 1% of gas consumption can be realised as a result of this intervention.
Rationale	The energy policy is the primary driver for making energy savings. Having an energy policy in place will ensure that everyone is on board. The monitoring and targeting of energy use can produce significant savings when combined with an awareness program driven via an energy policy with senior management commitment. When undertaking a program to reduce energy costs it is important to have frequent and accurate consumption data along with information on the factors that influence energy usage.

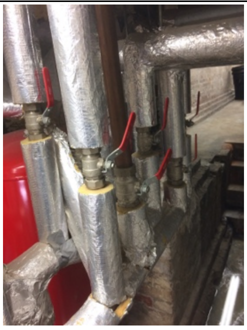
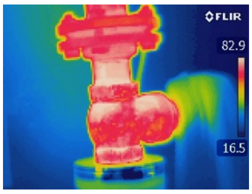
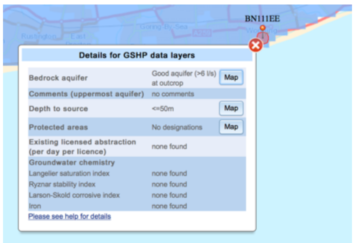
	Presenting the data obtained in the form of charts etc can help engage the audience in energy reduction actions and show changes in consumption in a more easily understandable format.
Risks	None
Next Step	1. Develop and maintain an effective energy policy and an action plan that is reviewed on a regular basis. 2. Appoint a person with responsibility for energy on site. 3. Appoint energy champions 4. Carry out reviews of energy performance and progress towards target. 5. Re-assess target if required.

Measure 5	Improve Monitoring and Targeting Practices			
Cost Saving £ per year	**CO_2 Savings Tonnes per year**	**Energy Savings kWh per year**	**Cost £**	**Payback Years**
82	0.4	1,486	N/A if carried out in house	N/A if carried out in house

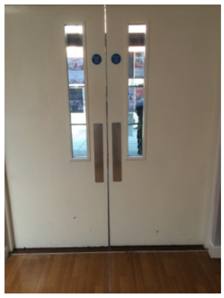
Detail	 It is recommended that the staff at the Centre establishe a regime of gas, electricity and water meter reading, ensuring that as a minimum, monthly readings of all utilities are taken. It is also recommended that readings are taken around the same time each month. For example at the end of every month. This will mean that the data can be interpreted more accurately. Meter readings could also be taken in order to determine to night time electricity consumption.  Just as important as tracking and measuring energy consumption, is the analysis of the data. It is recommended that a designated member of staff reviews the data to identify any anomalies and to seek ways of reducing energy consumption. Plotting monthly gas consumption (kWh) against monthly heating degree days provides for a better understanding of the sites energy consumption in relation to weather conditions. Heating degree days are a measure of the severity and duration of cold weather. The colder the weather in a given month, the larger the degree-day value for that month.
Rationale	The process of Monitoring and Targeting will enable the Centre to: identify avoidable energy waste, quantify savings made and identify issues that may need investigation.
Risks	None
Next Step	• Read meter readings monthly at around the same time each month so that data can be easily interpreted. • Establish what a typical night, week, month of energy used by the site. • Establish weather related patterns. • Set clear and achievable targets to reduce energy use in the buildings.

Recommendations requiring further investigation

Item No	Description of Recommendation
6	 Consider fitting windows with high performance acrylic, this will help improve the thermal characteristics of the building. In the past, in church buildings, polycarbonate has been used, but it has been known to discolour over time. High performance acrylic should help avoid discolouring. Expert advice should be sought so that the acrylic layer is adequately sealed in order to prevent condensation between the layers. It is acknowledged that planning permission may be an issue here.
7	 Consider upgrading the single glazed windows at the upper levels with double glazed windows. However, it is acknowledged that being a Grade II listed building, planning may be an issue here.
8	Consider connecting PIR motion controllers to the lights in the gents, ladies and disabled lavoratories. Anecdotally these lights are left switched on for around 13 hours/day. The lighting load in the gents lavatories is estimated to be around 0.072 kW [(2 x 36W)/1000]. It is estimated that these lights are only required around 4 hours per day. Therefore, it is estimated that connecting a PIR controller to these lights will result in an estimated energy saving of 0.648 kWh per day [(13hrs – 4hrs) x 0.072] and 34 kWh/year. The lighting load in the ladies lavatories is estimated to be around 0.108 kW [(3 x 36W)/1000]. It is estimated that these lights are only required around 8 hours per day. Therefore, it is estimated that connecting a PIR controller to these lights will result in an estimated energy saving of 0.54 kWh per day [(13hrs – 8hrs) x 0.108] and 28 kWh/year. The lighting load in the disabled lavatories is estimated to be around 0.028 kW [(1 x 28W)/1000]. It is estimated that these lights are only required around 4 hours per day. Therefore, it is estimated that connecting a PIR controller to these lights will result in an estimated energy saving of 0.252 kWh per day [(13hrs – 4hrs) x 0.028] and 13 kWh/year. However, the cost of installation may make this financially unviable in terms of pay back, unless the PIR controllers can be fitted by in-house staff.
9	 It was observed that the TRV connected to the radiator in the vestry was set to the highest setting. Develop a schedule to check TRV settings to ensure they are appropriately set.

10		Consider installing de-stratification fans to high level beams. A de-stratification fan linked to a thermostat will help circulate the warm air. There are examples of church buildings that have introduced these and have found that they can be unobtrusive.
11		Consider fitting valve jackets to valves in the boiler plant room. This will help reduce standing losses. Even though the thermal image shown below was taken at another site. It is a good visual tool to show the potential heat loss from an un-insulated valve. 
12		There have been issues with regards to the 2 Keston C40 gas-fired boilers. Anecdotally, these were installed in around 2009 however, as it takes so long to get the building to temperature the heating is left switched on 24 hours/day, 7 days/week. Engage the expertise of an heating engineer in order to identify the source of the problem with the heating. If necessary, alternative renewable forms of heating could be considered. As an example (as shown in the image below taken from a GSHP screening tool used on the British Geological Survey (BGS)[3] website, it appears that there is a good aquifer in the vicinity of the building to consider a open loop Ground Source Heat Pump (GSHP) system, however the lack of external space may make this unviable.  Another consideration could be an Air Source Heat Pump (ASHP) and could be investigated further. (some AHSPs come with a prtotective coating to protect them from the salty sea air.
13		Consider upgrading the wall mounted electric heaters in the Herridge room. Anecdotally these are used 40 hours/week for around 6 months of the year.

[3] The data was correct at the time the tool was created (August 2011 and April 2012).

14	 **Consider replacing/repairing or draft proofing the double-glazed windows in the Herridge Room. The same applies to the back, entrance door. This will help reduce heat loss through the building fabric.** **Anecdotally, the glass door at the entrance can be left stuck open, especially when there are high footfall levels. Consideration could be given to fitting an automatic closer and/or door brushes for glass doors.** 
15	 **During the survey it was observed that the south side wall could benefit from repointing work.**
16	 **Consider manually switching off the drinks machine over night, this will help reduce night time electricity consumption.**

3. ACTION PLAN

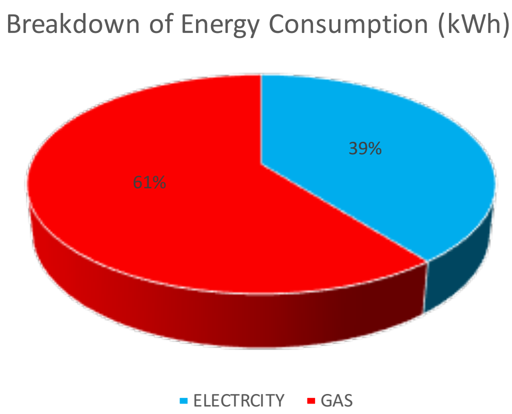
The priority of the measures in the table below is based purely on payback time.

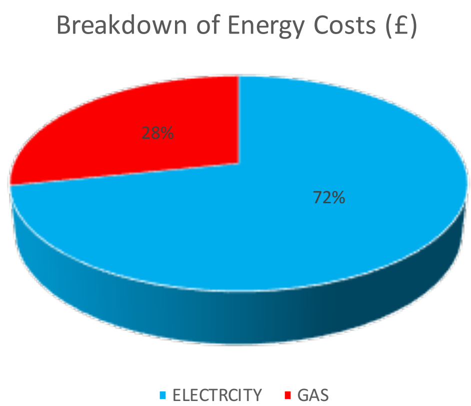
Measure	Recommendations	Estimated annual savings			Estimated cost (£)	Payback period (years)
		(£)	CO_2 (tonnes)	(kWh)		
1	Consider installing a photovoltaic (PV) array on roof areas	2,868	8.4	18,126	30,100	10.5*
2	Consider replacing high wattage lights with LED alternatives	817	3.7	8,094	3,214	3.9
3	Implement Staff Energy Awareness Training and Shutdown Procedures	88	0.4	1,486	N/A of carried out in-house	N/A of carried out in-house
4	Formulate, implement and publish a formal Energy Policy and determine an Energy Strategy.	88	0.4	1,486	N/A of carried out in-house	N/A of carried out in-house
5	Improve Monitoring and Targeting Practices.	88	0.4	1,486	N/A of carried out in-house	N/A of carried out in-house
TOTAL		3,932	13.3	30,678	33,314	8.5

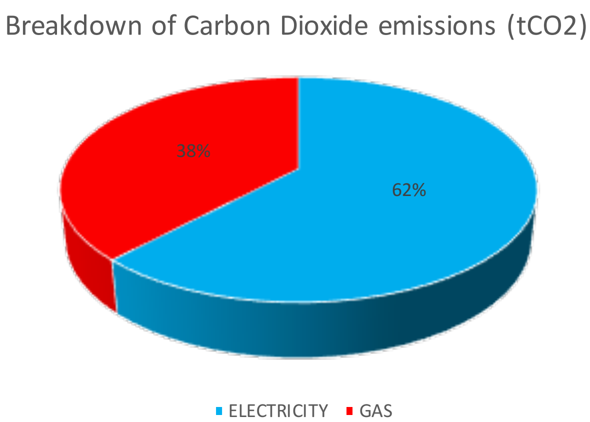
*Please note that, with regards to measure 1 above, the estimated financial savings reduce to £ 1,829 and the payback increases to 16.5 years if the FIT and export tariff are excluded. Thus the overall payback in relation to all suggested interventions would increase to 11.5 years. This is for illustrative purposes, in the event that the government removes the various tariffs.

APPENDICES

Appendix 1 Supplementary Information







Electricity

There was one electricity meter (D09X170449) supplying the Centre.

Gas

During the site visit 2 gas meters were seen. It is expected that one meter (M025A0057411D6) supplies the gas-fired boilers. The second meter had a serial number but it was not possible to see it or to provide a meter reading, using the photograph taken on site. During the survey it was not known whether this is a fiscal meter or a sub-meter and whether it is in operation; this requires further investigation with the utility company. If this meter is found to be in operation and it supplies the Centre, then it may be advisable to include it in the regime of meter reading as suggested on page 14 (regardless of whether it is a fiscal meter or a sub-meter) but first it would be useful to know which area it supplies. One way to check whether the meter is in operation is to take meter readings during the day, when gas is being used for heating and for catering purposes, to see if the meter turns.

In terms of areas supplied by the meters, one possibility, as mentioned above, is that the main meter (M025A0057411D6) supplies the gas-fired boiler plant and that the second meter may supply the kitchen, for catering purposes. This can be tested, by taking gas meter readings from the second meter when the heating is in operation and the kitchen is not being used. However, ultimately it is best to investigate this with the utility company to ascertain whether it is a fiscal meter and the area it supplies.

On another note, during the survey it was observed that the gas meter cupboard had become flooded with water, this also could be looked into.

Appendix 2 Energy Policy for the St Paul's Art Centre, Worthing site

Energy Policy

Policy Statement

St. Paul's Art Centre is committed to the responsible management of energy and water. By efficient management of these resources, the building management aims to minimise expenditure and environmental impact, maintain health and safety standards and maintain an acceptable comfort level for staff, students and other building users.

Strategy

This policy statement will be implemented through a simple four-point plan:

1. Responsibility

The overall responsibility lies with the Senior Management of the Arts Centre; day-to-day energy management responsibilities also lie with the Building Manager.

Policy, strategy and targets for energy management will be the responsibility of the Energy Team, which currently consists of:

………. Building Manager
………
……….
……….
……….

The Energy Team will meet quarterly to review progress, plan initiatives and prepare an annual energy report.

2. Energy information

Electricity, gas and water meters will be read Weekly/Monthly and closely monitored against expected usage. Abnormal consumption will be investigated and corrective action taken. Each year, realistic energy reduction targets will be set and monitored regularly.

3. Energy Performance

The latest energy data shows the following energy performance figures for the Centre:

Electricity: 100 kWh/m^2, Gas: 153 kWh/m^2, Carbon Dioxide Emissions: XX tonnes

This shows a reduction in carbon dioxide emissions of XX %, compared to last year's figures. The site's aim is to reduce carbon dioxide emissions by XX % over a five-year period starting in 2016-17.

4. Awareness

Regular awareness initiatives for staff at the Centre will emphasise the cost and environmental benefits of saving energy and water and how to avoid waste. Energy saving information will be provided to other building users. Energy Co-ordinators will be appointed with checklists for good housekeeping initiatives.

IMPORTANT NOTICE