OxFutures

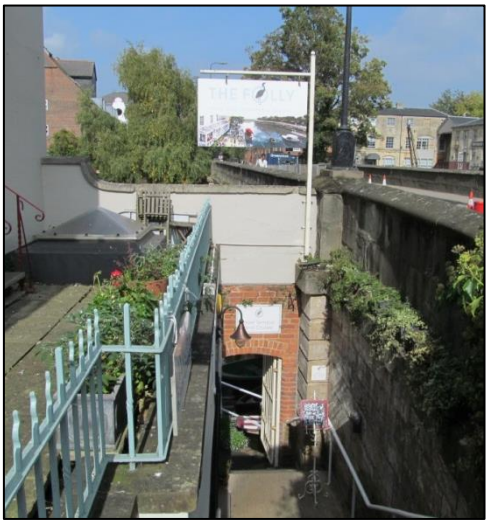
Energy Saving Recommendations Report

for

Folly Bridge Brasserie Ltd

October 2017

Survey of The Folly River Café and Restaurant



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ORGANISATION OVERVIEW

Report overview
EiE carried out a site visit and interviewed key staff. All recommendations in this report are based on information and observations obtained during the site visit and information subsequently provided by Giles. The report is set out in order of recommended priority based on ease of implementation, carbon impact, cost and factors discussed on site.

Client details		
Organisation name	Folly Bridge Brasserie Ltd	1 Folly Bridge Oxford, OX1 4JU
Contact name	Giles Dobson	giles@the-folly.co.uk 07834 827 530
Date of site visit	26th September 2017	Carried out by Moira Dorey

Energy savings recommendations - summary

Below is a summary of the opportunities recommended in this report. Costs and savings have been estimated using available information; an explanation is provided in detail for each opportunity. Estimations have been made based on energy data provided. Where savings estimations are not given further details/surveys would be required.

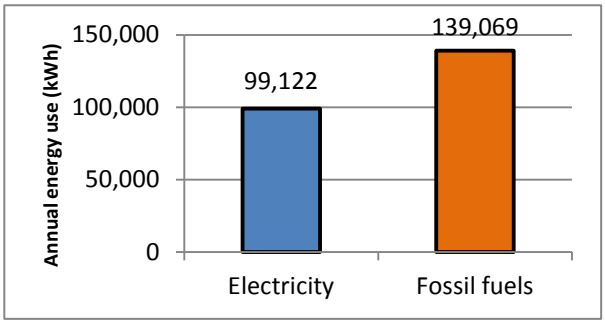
Opportunity	Savings (kWh / yr)	Savings (£ / yr)	Cost (£)	Initial Payback in years	Carbon Impact (tCO_2e / yr)
Take and submit meter readings	0	0	0	-	-
Conduct an out of hours survey	2,974	346	0	-	1.23
Add heating controls	3,122	363	350	3.86	1.29
Add timer to hot water	683	18	68	3.8	0.13
Monitor coffee machine energy use	-	-	-	-	-
Complete upgrade of lights to LEDs	1,390	162	156	0.97	0.57
Reduce heat loss from conservatory roof	2,974	346	3,265	9.45	1.23
Obtain quotes for heat recovery equipment	-	-	-	-	-
Consider a wood burning stove	8,921	1,037	2,300	2.22	3.68
Consider a commercial induction hob	-	-	-	-	-
TOTAL	**20,064 kWh/yr**	**£2,270/yr**	**£6,139**		**8.11 tCO_2e / yr**

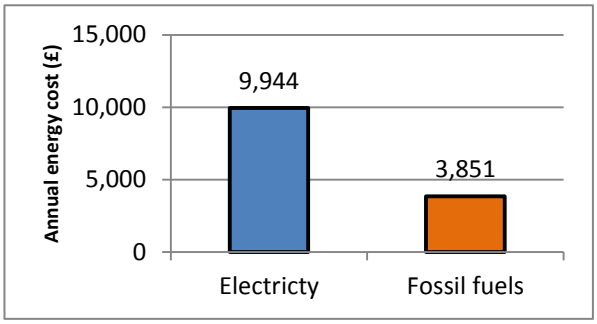
Site details
This historic Oxford building on the banks of the Thames was completely refurbished in 1999/2000 with a further upgrade in 2011. It consists of an indoor restaurant, a small bar servicing the restaurant and a large outdoor terrace. The restaurant has an electric heating system with gas used for hot water and cooking. It is open throughout the year from 10am to between 11pm and 1am depending on the day of the week.

ENERGY PROFILE

Energy consumption annual profile				
Fuel type	**Annual Energy use (kWh)**	**Cost per kWh (p)**	**Standing charge (p/day)**	**Approx. annual cost (£)**
Electricity	99,122	11.62	38.67	9,944
Gas	139,069	2.576	50	3,851

Energy profile breakdown for The Folly consumption (left) and costs (right)

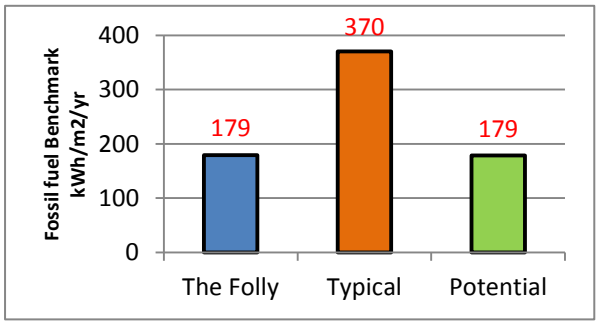


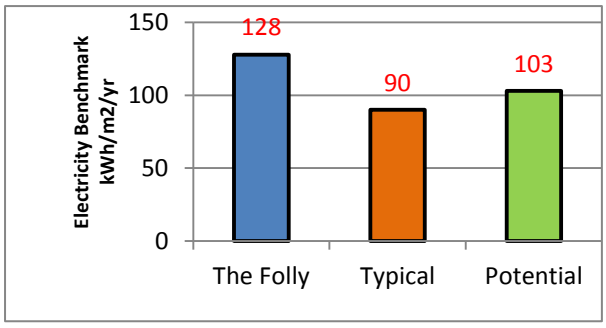


Consumption is based on figures provided from April 16 to April 17.

Energy benchmarking		
Energy saving (kWh)	**Cost saving (£)**	**Cost of actions (£)**
20,064	2,270	6,139

Consumption benchmarks by fuel type





Benchmarks are calculated using data provided and compared to CIBSE figures for the building category "Restaurant". Fossil fuel use is below the typical benchmark as the restaurant is heated using electricity instead of the more typical gas.

ENERGY SAVINGS RECOMMENDATIONS

Take and submit meter readings		
Energy saving (kWh)	**Cost saving (£)**	**Cost of action (£)**
0	0	0

Some of your gas and electricity bills are based on estimated readings. By recording and submitting energy meter readings to your suppliers regularly and accurately, energy management, as well as monitoring bills, will be easier. This will be particularly useful to monitor the success of changes you make when following recommendations in this report.

Actions

- Arrange to record actual meter readings / usage on the same day once per month. Enter these into a spread-sheet and calculate usage.
- Submit meter readings to your energy suppliers prior to invoicing (the timing of this will differ based on your bills). Depending on your supplier, readings can be submitted via website, email, or by telephone.
- Use this information to form a baseline for your consumption so that the effect of energy improvement measures can be assessed.
- When you have a year of readings, review information to ensure action is taken on noticeable increases in energy use.

Cost and savings calculations

There is no cost to this action. Staff time to collect and submit data will vary depending on the number of meters and method of collection. While there are no direct savings from this recommendation it will lead to increased awareness of energy use leading to greater control.

Conduct an out of hours survey

Energy saving (kWh)	Cost saving (£)	Cost of action (£)
2,974	346	0

The amount of energy used overnight in your building is unknown however you are concerned that many energy using items are left on unnecessarily. Carrying out an 'out of hours' energy survey will help identify wasted energy when the building is not in use.

Actions

- In order to identify wasted energy during out of hours periods, conduct a survey of energy use, arranging to switch off any items left on unnecessarily. These may include: lights, heating, fans, stand-by on machinery, or other appliances. Once this is completed, calculate the minimum practical out of hours hourly energy use (excludes essential energy use).
- To do this, take a gas and electricity reading after the survey (when no users are in the building) at the end of a work day or work week. Take the meter readings again first thing the next working morning before users arrive. Note the time the readings are taken.
- Calculate the average hourly out of hours energy use by subtracting the first meter reading from the current reading and dividing by the number of hours between both readings.
- Regularly collect out of hours meter readings again and compare the average to the original (after the survey). If there has been an increase, further action to switch off unnecessary items may be needed.

Cost and savings calculations

There is no cost to this action. Staff time to collect and analyse data will vary depending on the method of survey and collection.

Savings are estimated at 3% saving in total electricity bill. As there is no gas heating it is unlikely that any gas appliances are left on. Gas water heating is covered in a separate recommendation.

ENERGY SAVINGS RECOMMENDATIONS

Add heating controls		
Energy saving (kWh)	**Cost saving (£)**	**Cost of action (£)**
3,122	363	350

The heating is manually controlled. It is turned on and off as staff arrive and leave depending on the weather conditions. Install heating controls that allow times to be set easily. This will help reduce costs from unnecessary heating when the staff forget to turn it off. Programme the heating to turn on a maximum of 30 minutes before building users arrive and to turn off 15 minutes before they leave. This will allow the area to be heated sufficiently for the duration of the use.

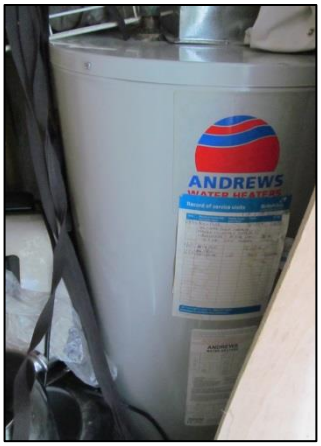
Actions

- Review and record heating requirements in your building taking into account the following:
  - Is heating required at the same time every day of the week or would a 7-day programmer, which would allow you to programme the heating a week in advance, be more appropriate?
  - Will this programmer also act as the room thermostat or is situated elsewhere in the building?
  - Does the time and temperature need to be set diffently for different heaters?
- Once this review is completed contact a local qualified electrician to quote for installing appropriate heating controls. We recommend contacting at least three contractors for quotes.

Cost and Savings calculations

The cost is based on £100 of timing equipment plus a half day of an electrician's time. Savings assume that heating represents 30% of all electricity and that heating is left on unnecessarily 25% of the time.

Add timer to hot water		
Energy saving (kWh)	**Cost saving (£)**	**Cost of action (£)**
683	18	68



Your hot water boiler in the upstairs changing room is permanently switched on and heating water 24 hours a day 365 days a year. The boiler is rated at 9.5kW and will use about 5kW a day to heat the water.

Install a timer to better control heating times. Energy will be saved by only heating the water when staff are working in the building.

An example timer is here:
http://www.screwfix.com/p/lap-7-day-digital-immersion-timer/1804r.

Actions

- Fit the boiler with a 7 day timer that is set to turn the boiler off when not needed (for example 1am every night).
- Programme the timer to turn on 30 minutes before hot water is required ensuring that the timer is set so that it does not come on too early when you have later start days.

Cost and savings calculations

As the hot water boiler is hard-wired you will need to get a qualified electrician to wire in a timer. Timers cost around £18 plus a couple of hours labour (£50 per hour estimated), or less if the electrician is on site anyway. Savings assume that the water heater can be switched off 9 hours a day from midnight to 9am.

Monitor coffee machine energy use

Energy saving (kWh)	Cost saving (£)	Cost of action (£)
0	0	0

Your coffee machine was identified as being switched on ready for immediate even when not needed.

Powering catering equipment when not needed wastes energy however the amount of wasted energy from this coffee machine is not currently known. Measuring the amount of power used by the machine out of hours will determine what further action should be taken.

Actions

- Install a plug monitor at the plug socket to monitor how much energy the coffee machine uses in an hour, a 24 hour period and 7 day period.
- Record the results and review them.
- Discuss with machine supplier whether the machine can be switched off without causing disruption.
- If results of the above action show that it is practical and cost effective to switch off the machine, include this in the switch off procedures for staff at the end of the night.
- Carry out checks to ensure that equipment is turned off as expected.

Cost and savings calculations

A 7 day plug monitor is available at no charge from the auditor. Savings are not known until the energy use is monitored.

Complete upgrade of lights to LEDs		
Energy saving (kWh)	**Cost saving (£)**	**Cost of action (£)**
1,390	162	156

Most of the lights in the restaurant are already LEDs however the kitchen lighting is still older style T8 5 ft fluorescent light tubes. LED lights are more energy efficient and exist for nearly every fitting. LEDs last up to 35,000 hours before they need to be replaced (fluorescent lights last 15,000 hours) resulting in reduced maintenance costs.
Example LEDs can be found here:
https://www.tlc-direct.co.uk/
http://www.lightingsupermarket.com/
https://www.ledhut.co.uk/

When selecting replacement lights there is also an opportunity to provide better lighting rather than using equivalent lights. Consider both the light quality preferred (known as colour temperature) that ranges from warm white, cool white or daylight and the level of brightness needed (measured in lumens).

Some LEDs can replace existing lights without modification of the light fixture. However, fluorescent fixtures need to be adapted first by either removing the starter or ballast, depending on the product. Sometimes replacing the entire fixture is easier and more economical over time.

Ensure that, whichever supplier you use, they offer a minimum 5 year failure replacement guarantee and are prepared to let you test a number of LEDs to ensure the light quality is correct before making a final purchase.

Actions

- For all non LED lights consult lighting suppliers to determine equivalent LED replacements.
- Arrange for replacement of kitchen lights.

Cost and savings calculations

Cost = 8 x £7 = £56 plus installation £100 Total £156
Saving = 8 x 58W tubes on for 14 hours a day = 2371kWh/year. Replace with 8 x 24w tubes = 981kWh/year.
Saving per year = 1390kWh

Reduce heat loss from conservatory roof		
Energy saving (kWh)	**Cost saving (£)**	**Cost of action (£)**
2,974	346	3,265

Your victorian conservatory, with glass atrium, is a feature of the restaurant however heat is lost through the glass. As the river view contributes to the atmosphere in the restaurant, even at night, it is not recommended to put blinds on the side windows. However adding blinds to the glass atrium, fitted into place with a sealed frame**,** with sufficient thermal insulation properties, will reduce heat loss and uncomfortable draughts in winter.
Also, closing blinds before direct sun light overheats the room in summer will help keep the indoor air at a comfortable temperature. For examples of roof blinds go to: http://www.conservatoryblinds.co.uk.

Additionally, rooms with high ceilings generally suffer from heat rising and getting "trapped" at the apex of the ceiling. At The Folly the hot air rises but is currently lost through the glass atrium. This will result in wasted energy as the heating is turned up to compensate at customer level. De-stratification fans could help the warm air to circulate, increasing comfort for customers and reducing heating requirements. They are available in both traditional and modern versions (see images).

For more information:
http://www.airius.co.uk
http://www.reznor.co.uk/en/uk/destratification

Actions

- Contact 3 roof blind companies to obtain quotes. The link above for Conservatory Blinds gives useful information on the requirements for roof blinds.
- Contact appropriate suppliers to obtain a site visit and quotes for de-stratification fans.
- Consider the options for traditional versus more modern fans

Cost and savings calculations

An average cost of installing roof blinds is £3000.
De-stratification fans 2 x £70 = £140 plus fitting (half day) = £265. Total for measures £3265.
Savings estimate a 10% saving on heating element of electricity usage (estimated at 30%).

Obtain quotes for heat recovery equipment

Energy saving (kWh)	Cost saving (£)	Cost of action (£)
-	-	-

Your kitchen is a very hot working environment whilst the adjoining restaurant often uses energy to heat it up diners to a comfortable level. During the audit visit there was a discussion about options to move heat from the kitchen to the restaurant without transferring the cooking smells.

Heating in the restaurant is electrically powered, so the options appear to be limited without a total replacement of the heating system (to a wet heating system with radiators). There may be an opportunity to heat hot water via heat recovery panels specifically designed to capture heat given off by commercial kitchen equipment (see image on left). Dext Heat Recovery is one specialist company who would be happy to discuss options and may also have suggestions for heat recovery from your refrigeration rooms.

Actions

- Contact Dext http://dextheatrecovery.com to discuss option for heat recovery in your kitchen.
- If this discussion suggests that heat recovery is a financially and practically viable option contact additional companies for competative quotes.

Cost and savings calculations

As this is a specialist technology, created bespoke for each kitchen, costs and savings have not been calculated.

Consider a wood burning stove		
Energy saving (kWh)	**Cost saving (£)**	**Cost of action (£)**
8,921	1,037	2,300

The current heating system in the restaurant is all electric which is an expensive, carbon intensive, method of heating. A wood burning stove to heat the restaurant, venting to an outside wall, would provide the opportunity to make use of local wood fuel, a renewable resource, whilst reducing use of electric heating. Wood burning stoves are available in a wide range of traditional and modern styles. You may feel that a wood burner would also add to the ambience of the restaurant in winter. Sourcing wood fuel locally can also help forestry management businesses. Wood burning stoves are availalble at a wide range of prices and quality. The Stove Hub https://www.thestovehub.co.uk is a good source of helpful information on what to look for.

Actions

- Request a visit from 3 suppliers to draw up a specification for a wood burning stove.
- Obtain quotes for a good quality supply of wood fuel.

Cost and savings calculations

Cost to install a wood burning stove including installation is estimated at £800 for the stove and £1500 for installation = £2300. There will be an on-going cost of wood fuel if this is not obtainable from a free source locally. Savings estimate a 30% saving on the heating element of electricity use.

Consider a commercial induction hob		
Energy saving (kWh)	**Cost saving (£)**	**Cost of action (£)**
-	-	-

You are planning to replace one of your cooking ranges shortly. During the energy audit visit we discussed electric induction hobs as a method of reducing wasted energy and over heating in the kitchen. Falcon Food Service provide helpful information on this type of hob:
http://www.falconfoodservice.com/InfoCentre/Advice/BuyingGuides/BuyingInduction.aspx.

They sum up the pros and cons as follows:
'There is no doubt that induction provides many benefits to any chef, including energy savings, faster heat up times, easy cleaning and instantly controllable heat but that doesn't mean it's for everyone. There are some downsides to induction also, the main one being cost. An induction unit is generally more expensive than its gas or electric equivalent (for example, Falcon's induction range is 3 times the price of a six burner gas range, while an electric four zone boiling table is half the price of the induction model). New cookware may have to be purchased if not made of ferrous material. In many places electric costs are much higher than gas, potentially negating the energy savings resulting from the more efficient induction unit'.

You are currently cooking with gas which is both cheaper and has a lower carbon footprint per kW used than electricity. Rough calculations based on an 8kW 4 gas burner range versus a 5kW 4 zone induction range suggest a possible saving through installing an induction range of around £500 a year however further detailed analysis would need to be carried out before purchase.

Actions

- Contact 3 suppliers of good quality kitchen equipment who supply induction hobs to discuss their experience.
- Ask them to provide references to chefs who have used induction hobs for a personal perspective.

Cost and savings calculations

Costs and savings not calculated due to uncertainty over requirements.

FURTHER RESOURCES

FUNDING

Possible sources of funding for the recommendation in this report:

OxFutures – 25% funding towards the cost of energy reduction and generation measures. Contact Alison Grunewald E-mail: alison.grunewald@lowcarbonhub.org

Carbon Trust Green Business Fund - https://www.carbontrust.com/client-services/programmes/green-business-fund/