

# Gimblet Rock Holiday Park, Pwllheli (Haulfryn Group) - Undertaking an energy audit of pool and leisure facilities



**Location:** Gimblet Rock, Llyn Peninsula, Pwllheli, Gwynedd, LL53 5AY

**Proprietors:** Haulfryn Group

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**Grading/Awards:** 5\* Holiday Park

**Number of Pitches:** 126

**Seasonal Opening:** Open from 1st March to 10th January

**About Gimblet Rock:** Holiday home owners at Gimblet Rock have exclusive use of the brand new, purpose built leisure facilities, including indoor heated pool, sauna, fitness room, bar and restaurant.

**The Energy Audit:** An accredited independent consultant visited Gimblet Rock and undertook a survey with park manager, Kevin Roberts. This survey took half a day and required some information from Kevin on their energy usage. The survey;

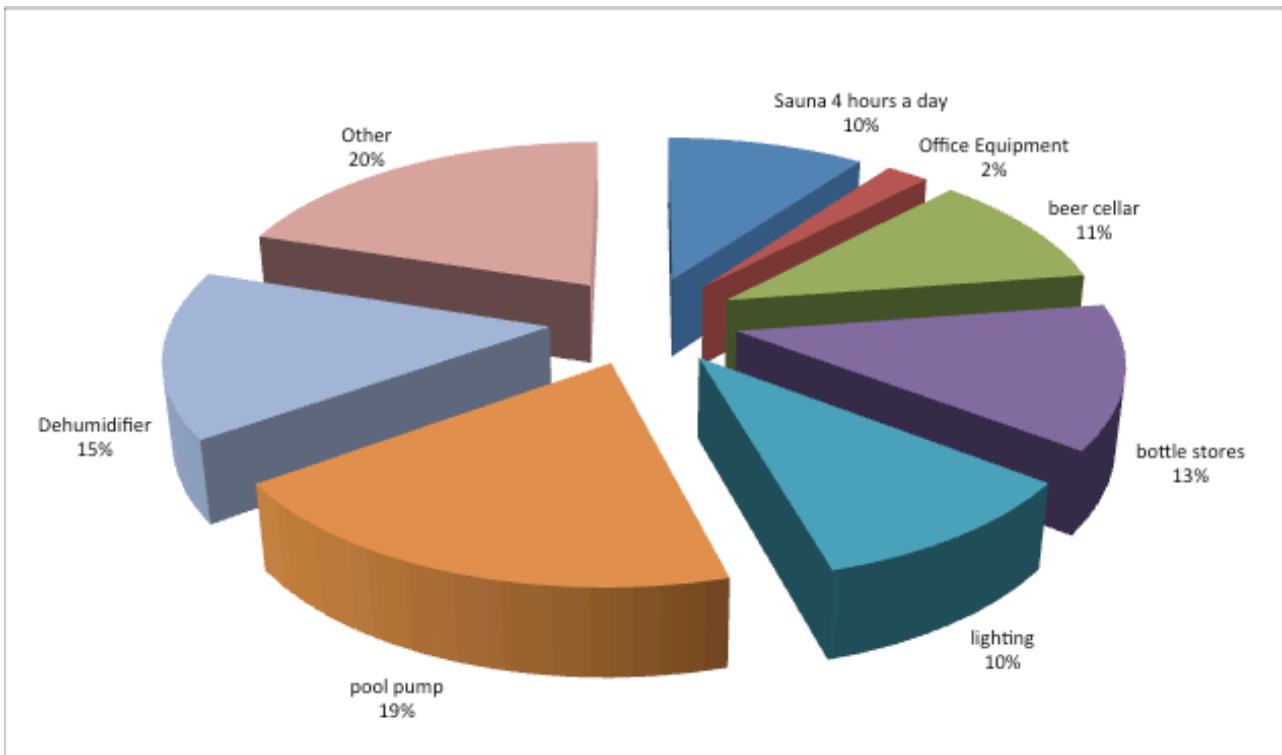
- Reviewed Gimblet Rock's energy usage
- Identified energy-saving opportunities
- Defined practical 'next steps'

"The survey was very easy to carry out and at each area of the operation useful tips and advice were freely given. This opened my mind to the huge savings of energy costs that could be made by changing things slightly. It certainly does make you think about the way you operate your business benefiting the environment and your bottom line profit and loss." Kevin Roberts, Park Manager.

## Review of Gimblet Rock's Energy Usage

Utility	Energy Consumption		Cost		CO <sub>2</sub> Emissions
	kWh/year	%	£/year	%	tCO <sub>2</sub>
LPG gas	109,022	48%	6,969	37%	23
Elec	117,248	52%	11,725	63%	64
<b>Total</b>	<b>226,270</b>		<b>£18,694</b>		<b>87</b>

## Breakdown of Gimblet Rock’s Electricity Usage and Expenditure



### Recommendations

Based on the survey findings Kevin received 13 recommendations for improving energy efficiency at Gimblet Rock.

**Recommendation 1:** It was suggested that Haulfryn, develop a generic energy or environmental policy and then tailored versions for each site including Gimblet Rock. Such a policy will ensure that records are kept of energy usage, will enable the implementation of the energy saving recommendations and monitor the savings made. All staff should be involved in the development of the policy and its implementation.

A good way of developing an Energy Management Strategy is to use the 5 step process described in the ‘Energy Management Strategy’ (CTV022) available from [Carbon Trust](#).

**Recommendation 2:** Staff involvement. Once the energy audit report recommendations are acted upon it is important that the staff are made aware of the opportunities and the reasons for the changes. This might take the form of laminating forms showing the settings and procedures relating to the pool, and switch off procedures for the site at night.

**Recommendation 3:** Energy Performance Reporting System. Haulfryn already have an energy consumption reporting system in place. It was recommended that a performance reporting system should be developed to show each site how they are performing against expected consumption patterns. This information should then be sent to Gimblet Rock, so that the site can assess the improvements that they have made with regard to improving their energy efficiency.

**Recommendation 4:** Reduce Pool Temperature. Using energy efficiently can save up to 25% of overall operating costs of a typical swimming pool. Implementing good energy management techniques can minimise consumption without lowering the standard of service to users. It was recommended that the air temperature in the Gimblet Rock pool hall be kept within 1° C of the pool water temperature. The relative humidity in the pool hall should be kept to 55-65%.

	Pool Temp	Air Temp	Relative Humidity
Gimblet Rock (current)	32.7°C	35.2°C	25%
Recommended	30°C	31°C	65%

Recommendations were also made to change the control mode for the pool system to a mode which would give better control and energy savings.

**Recommendation 5:** Reduce sauna run-time by 1 hour a day. The sauna has an 8kW heating element and therefore, by reducing the operation of the sauna by one hour a day savings £292 can be made. This is a simple quick win saving, by ensuring that the sauna is only switched on when guests want it, staff can ask as guests enter the building.

**Recommendation 6:** Install a timer on the drinks machine. The vending machines are currently left on out of hours, switching the vending machines off at night will give a £40 saving. This can be achieved using a simple 24 hour mechanical timer, which can cost as little as £5 to purchase.

**Recommendation 7:** Office photocopier. The photocopier is currently on during office hours, and potentially on during the night, switching the photocopier off at night will give a £40 saving. This can be achieved using a simple 24 hour mechanical timer, which can cost as little as £5 to purchase.

There are three key methods of saving energy in electrical equipment:

1. Activate the 'power-down' or energy saving devices built into machines during the working day. Screensavers do not save energy and some actually increase consumption.
2. Switch off machines (manually or automatically) at the end of the working day (produces the maximum saving).
3. Purchase the most energy efficient models. For example, LCD flat screens for computers consume 20% of the energy of conventional cathode ray tube monitors.

**Recommendation 8:** Change to low energy light fittings. The installation of lighting sensors was recommended to control when the lights are on in the male and female changing rooms and toilets, as well as the disabled toilets, pool side changing, reception, office, games room, kitchen, cellar and dining areas. Each will need its own sensor and settings, for those areas subject to good natural daylight, it is suggested that lux level settings are configured to automatically turn off the lights when natural light levels are sufficient.

It was noted that some of the light fittings still had standard bulbs installed, it was suggested that these be changed to either halogen or CFL bulbs.

It is suggested that all bulbs are replaced with LED lights, however, it was strongly suggested that either well known brand names are selected or that a reputable supplier who states the "lumen" output of the lights is chosen as there is a VERY wide variation in quality and light output from LEDs. Ensure that the 12V and mains voltage (GU10) LEDs have at least a 300 lumen output.

The suggested light levels for areas are shown below;

Recreation room	300-750 lux
Changing room	150 lux
Gym / fitness centre	300 lux
Office	300-500 lux

**Recommendation 9:** Install a Variable Speed Drive (VSD) on the swimming pool pump. A 4kW VSD will cost £1,500 to install, this will save more than £1,200 per year.

A VSD operating at 80% pumping speed will consume approximately half the energy required at full speed. The pool circulation pump speed can readily be reduced to 80% for the majority of the year, potentially set even lower overnight, as the pool is rarely full outside of the peak summer season, therefore the amount of filtration required is reduced.

**Recommendation 10:** Install a pool cover. Pool covers can save 90% of operating costs overnight, which represents a 25% saving overall. There are two options of pool covers, physical covers and liquid covers, it is thought that due to the low use and the potential for greater savings during the day, that a liquid pool cover is trialed. This would need to be monitored very closely to ensure that forecast savings are achieved as this technology is relatively new and not subject to the same amount of technical reviews as the physical covers.

**Recommendation 11:** Purchase new bottle coolers (two new double and one new single). These could be purchased through the [Enhanced Capital Allowance scheme \(ECA\)](#). This provides businesses with 100% first year tax relief on their qualifying capital expenditure. The Energy Technology List (ETL) specifies the energy-saving technologies that are included in the ECA scheme. The scheme allows businesses to write off the whole cost of the equipment against taxable profits in the year of purchase.

The energy technology list has many energy efficient bottle coolers which use approximately 30% less energy than the standard bottle cooler, however, this is considered to be low as in this instance as it was noted that the bottle coolers compressor was working on a high duty due to the low levels of ventilation in the current fitted bar. It is suggested that you ensure that the replacement unit has a front vent that is both used to draw in ambient air and exhaust the air warmed up by the cooler.

New coolers would cost £1,100 and would save £500 per year, so the payback period would be 2.2 years.

Carbon savings of 2.7 tonnes.

**Recommendation 12:** Install a 10kW wind turbine. Initial investigations suggest that the site may be suitable for a wind turbine. Initial investigations were undertaken to provide a rough first level estimate of the potential. The government's NOABL wind speed data base was used to estimate the wind speed in the area.

- A 10kW wind turbine manufacturer considers that the output is 30,400 kWh per annum at 6m/s
- The installed price of £40,000 is an estimate as the cost of installation is site specific
- There is the potential for £10,550 savings, at an installation cost of £40,000, the payback period is 3.8 years.
- There is the potential for carbon savings of 16.5 tonnes.
- The government have a new arrangement called the "Feed in Tariff" whereby for wind turbines up to 15kW you get paid an income of 26.7p/kWh over and above either the offset electricity used on site or any export price paid by utility company to you for excess generation feed into the electricity grid.

This is a guide only and that before you make the investment that you gain a second opinion on the saving based on a more finely tuned assessment of actual savings based on you actual night and day units (not provided as bills were at the accountants) and an estimated daily wind turbine output profile / monitored half hourly electricity consumption profile.

**Recommendation 13:** Installation of a photovoltaic (PV) system on the roof. Generation of electricity by photo voltaic systems is eligible for financial incentive payments from the government under the Feed in Tariff - this dramatically changes potential income and payback times from their installation.

Installation could be arranged by Haulfryn or undertaken via a "rent a roof" scheme whereby a third party installs the panels in return for some or all of the financial incentives offered by the Government. There are many different 'rent a roof' deals available but it was recommended that Haulfryn consider a deal whereby they get to use any of the electricity that is generated, free of charge, and that the installation company gets to keep any of the benefit under the 'Feed in Tariff'.

A 3.9kW photovoltaic system for Gimblet Rock, would cost approximately £17,000 to install and cover 29m<sup>2</sup> roof area, generating 3,180 kWh a year.

Under rent a roof scheme where they get to keep the electricity generated by the PV system, if it is consumed on site the electricity bills reduce by over £318 a year, the company installing the system will get the feed in tariff, worth approximately £1,313.

It is worth noting that if Haulfryn payed for the installation themselves they would keep all of the benefits including the feed in tariff, which results in a total income of £1,631 giving an approximate 10 year payback.

**Summary of total costs and savings accrued by implementing the recommendations**

Priority: Recommendations		Estimated annual savings			Estimated cost (£)	Payback period (years)	Calculations & assumptions
		(£)	CO <sub>2</sub> (tonnes)	(kWh)			
1	Reduce Pool Temperature	£678	2.3	10,607	£-	-	Reduce the air temperature from 35.2 to 32 Degrees Centigrade, and control relative humidity to 60%.
2	Sauna - reduce run time by 1 hour a day	£292	1.6	2,920	£-	-	Saving 8kW by reducing the run time of the sauna for 1 hour a day
3	Drinks machine on a timer	£40	0.2	400	£10	0.3	Reduction in consumption of 100W for 4000 hours a year.
4	Office equipment - photocopier	£40	0.2	400	£10	0.3	Reduction in consumption of 100W for 4000 hours a year.
5	Lighting Projects	£700	3.8	6,996	£755	1.1	Various projects highlighted in text
6	VSD on pool pump	£1,203	6.5	12,033	£1,500	1.2	VSD running at 80% duty
7	Install a pool cover	£1,597	5.3	24,990	£3,000	1.9	Pool cover used during the night
8	2 new double and one new single bottle stores	£500	2.7	5,000	£1,100	2.2	A double bottle store selected off the ECA list will save 2000 kWh per year and a single will save 1000kWh per year
9	Wind turbine	£10,549	16.5	30,400	£40,000	3.8	
10	PV on roof	£1,631	1.7	3,180	£17,000	10.4	
<b>TOTAL</b>		<b>£17,230</b>	<b>41.0</b>	<b>96,926</b>	<b>£63,375</b>	<b>3.7</b>	<b>-</b>