

Hospitality Energy

Best Practice Guide

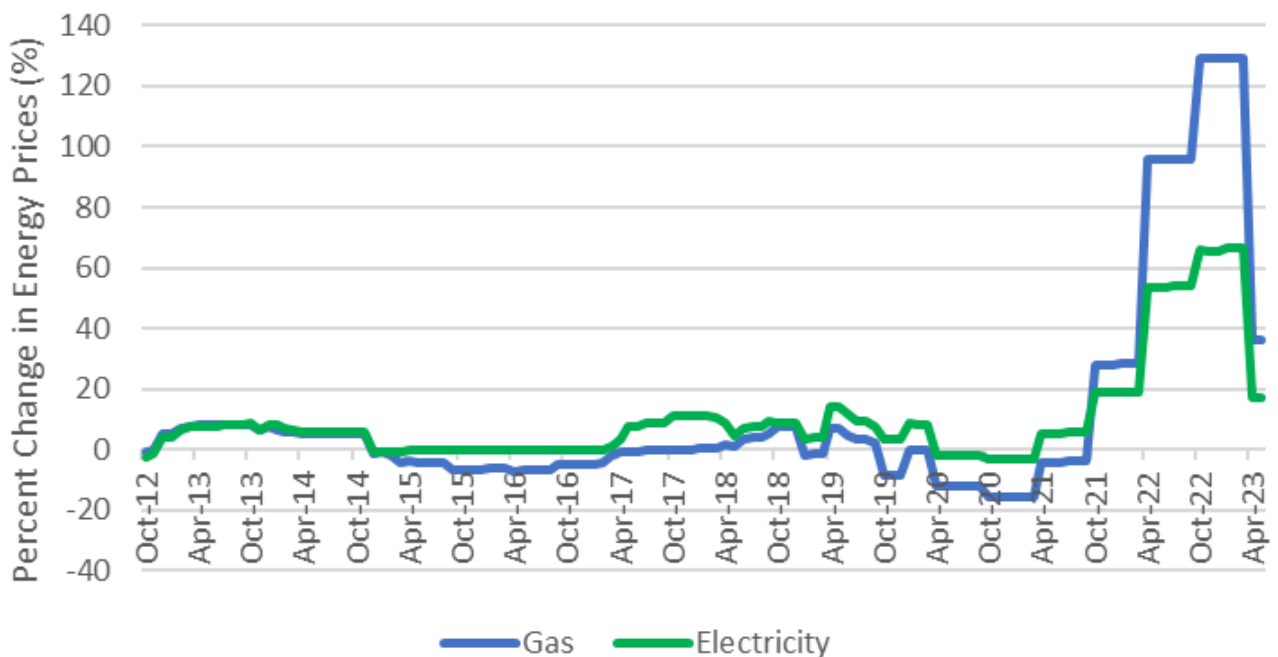


Straight talking.
Solutions focused.

Currently the hospitality sector is being put under intense pressure due to the ongoing volatility in energy costs. Data from the Office of National Statistics shows this for both gas and electricity, with relatively low gas prices in 2020 due to the pandemic before a dramatic increase in costs, caused by the energy crisis and war in Ukraine. It is unlikely that prices will return to those seen in 2020 and early 2021, and improving efficiency will be essential to ensuring ongoing competitiveness, with the added benefit of reducing the carbon footprint of your business.

Acting now to reduce energy can safeguard your business in the long term.

Current Energy Price Volatility



Data from the Office of National Statistics

Some simple steps can relieve some of this pressure, while helping your pubs carbon impact and creating a more comfortable environment for your customers.

Straight talking.
Solutions focused.

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Where Does my Energy Go?

Sometimes it's tough to know exactly what's happened to the energy you pay for. In a food-led pub, the average energy flows look like the diagram below. The biggest gas user tends to be heating, but large amounts of energy gets lost – particularly in the kitchen.

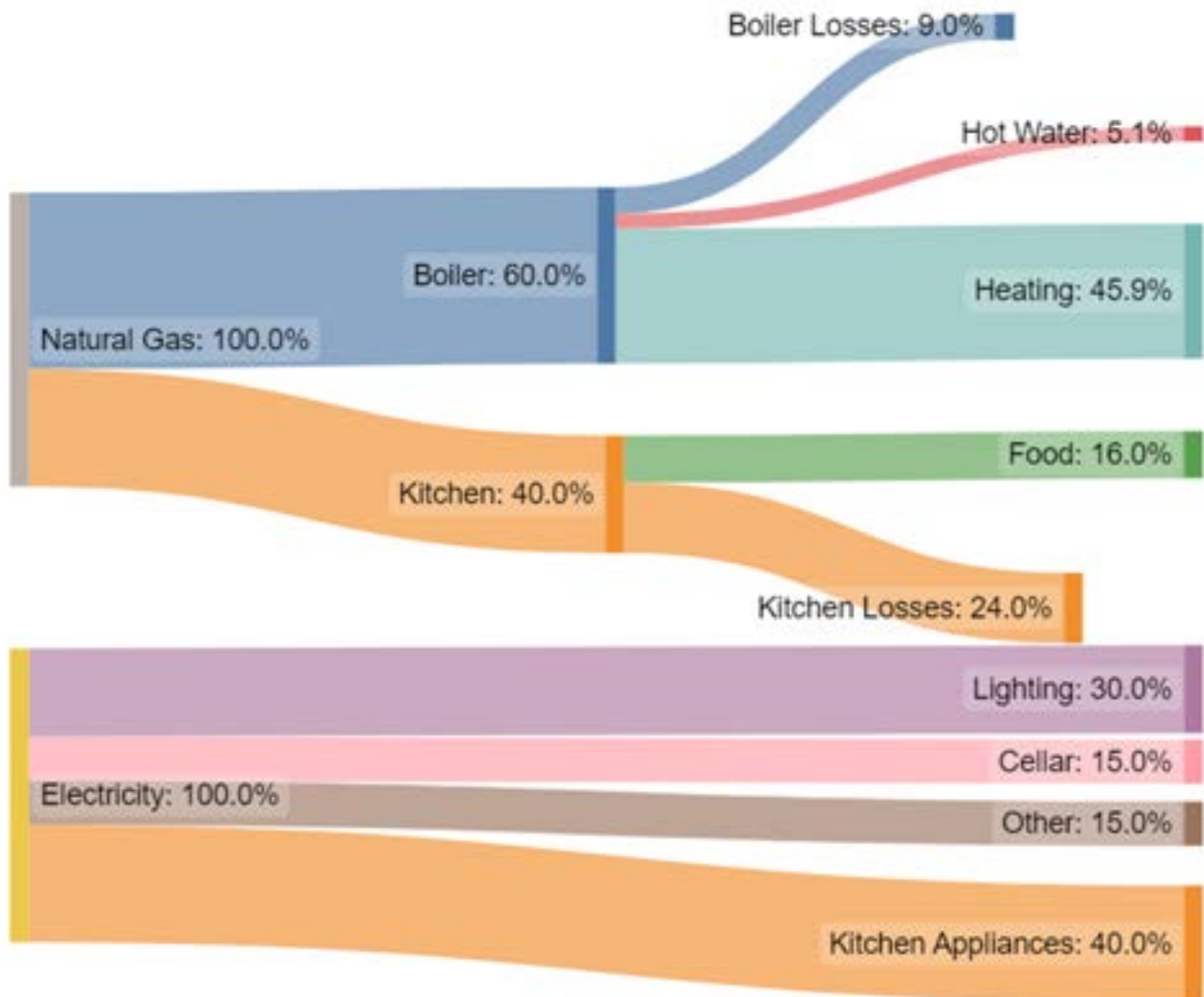


Figure 1; The 'Sankey' diagram above shows where energy is used in a typical pub

Area Check list

The following section gives some quick tips to make sure your equipment is running as efficiently as possible, and energy consumption is minimised. These steps can be done today to help reduce your energy bills.

Heating System – Checklist

✓ Frequency	Description
Weekly	Check furniture hasn't been moved to block your radiators
Weekly	Check radiator valves are set to desired position (e.g., 3)
Monthly	Bleed Radiators
Monthly	Check system pressure is between 1-1.5 bar
Annual	Boiler service
Annual	Lower the flow temperature of your boiler to maximise efficiency
Bi-Annual	Consider flushing your radiators to increase efficiency

Kitchen – Checklist

✓ Frequency	Description
Daily	Make sure hot lamps aren't on before service and are turned off as soon as service finishes
Daily	Turn off extraction at night, if variable, make sure extraction matches the level of food being cooked
Bi-Monthly	Defrost freezers

Cellar – Checklist

✓ Frequency	Description
Weekly	Check your cooling units (inside and out) aren't being blocked
Monthly	Check fans and grills are clean
Annually	Service your refrigerant system
Annually	Top up refrigerant
Ongoing	Don't cool what you don't have to, make sure cellar doors are shut and fit well
Ongoing	Can you reduce the effective size of your cellar, remember you have to cool the unused space as well as the drinks

Bar - Checklist

✓ Frequency	Description
Daily	Switch off bottle fridges at night
Daily	If you have an espresso machine, reach out to the manufacturer, ask if they have any advice on switching the machine off overnight.

No Cost

These actions can be taken right now to reduce your energy bills, at no cost to you. Changing how you use your building can have a large impact on your energy use, and simple steps like turning off equipment and changing what time the heating comes on can quickly add up over a year. Everyone should try to implement some or all these steps to lower your energy bill.

Turn it Off!

Equipment left running when it's not being used is a waste of energy and money. While it's easy to forget to switch equipment off, the costs quickly add up – particularly if left overnight.

Did you know:

Leaving your extraction running when you're not cooking costs you twice. The fan costs money to run, but it also takes air that you've paid to heat and moves it outside – this must then be replaced by heating up new, cold air.

What you can do:

Remembering to turn off equipment can often be challenging. The key is making it obvious that equipment is running, and making it easy to know when to turn equipment on.

- Putting labels on light switches saying when they should be turned on
- Check your times – if food service finishes at 10, aim to have all your equipment off by 10:30
- Keep track – Try keeping score of when equipment was turned off for a week or two, see if you can beat previous scores

We've summarised how much an extra hour a day costs to run equipment, when taken over the course of a year:

Equipment	Switching off for an hour a day over a year could save
Lights	£400
Extraction	£338
Hot lamps	£23
Warming cupboard	£92
Combi Oven	£200
Dishwasher	£138
Fryers	£70
Grill	£70
Hob	£460
Fryers	£25
Grill	£25

Heating Controls

Most pubs have heating and hot water constantly switched on, even when it's not being used. Turning down your building temperature when the pub's closed is a simple way to save on energy costs. Most modern thermostats can control temperatures at different times of the day.

Did you know:

Each degree you lower the temperature can save £350 per year. Guidance from the World Health Organization suggests that 18°C is a comfortable temperature for most adults.

What you can do:

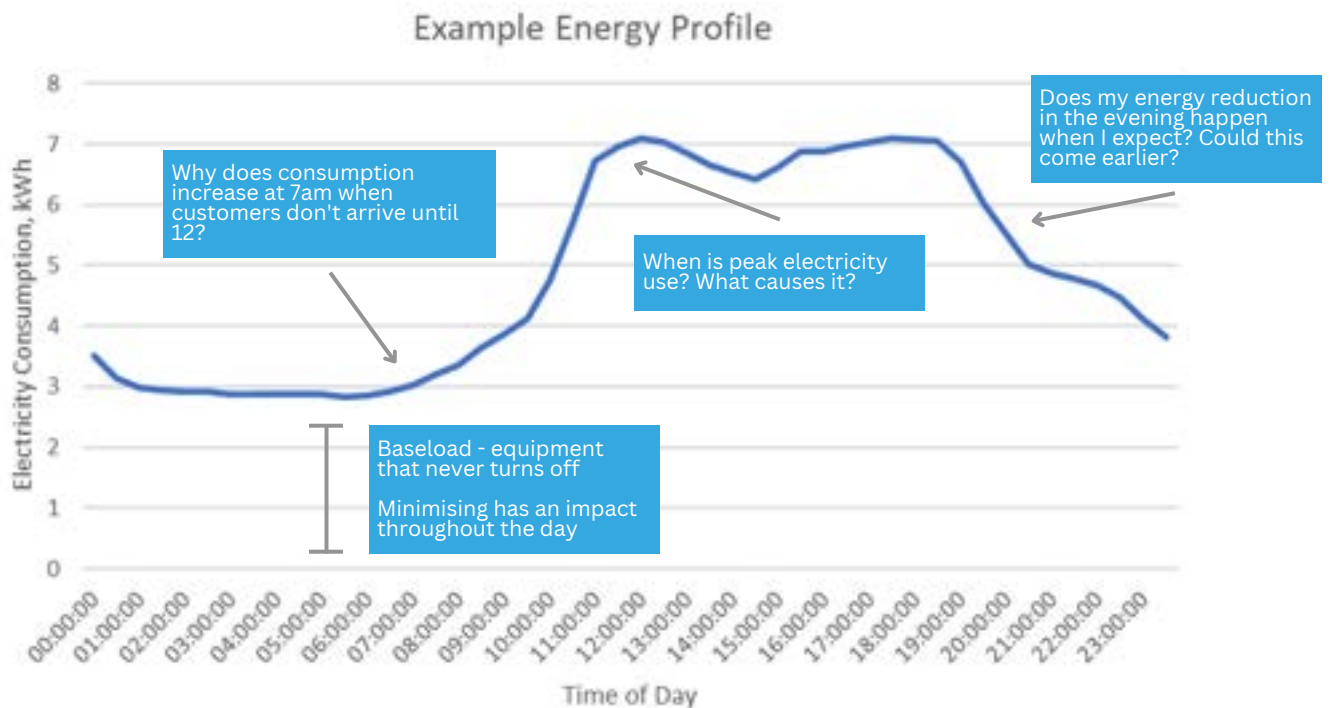
Set your heating to 18°C and have your heating switch to a lower temperature overnight. Warming up just in time for when guests start arriving in the morning could significantly lower your bills.

The same advice applies to your cellar – beer should be kept between 11 and 13°C. Make sure you're not wasting energy by overcooling your cellar!

Smart Meters

Smart meters don't directly lead to energy savings, but knowing when and where you're using electricity will help to spot how to lower your bills. Smart meters are becoming increasingly common for electricity consumption, and can help identify opportunities to lower your bill.

How to Read a Consumption Profile:



What you can do

Regularly look at your consumption data and see if there are any peaks where there shouldn't be.

Try to recognise patterns, such as lighting coming on early in the morning, and see if you can make changes to alter this – do lights need to be on when I arrive, or when my first customer comes through the door?

Lowering your 'baseload' (the amount of energy that is constantly being used keeping lights on, fridges running etc) will have the greatest impact, as it occurs throughout the day. A baseload of 3kW will cost £6,570 over the course of the year. Some of this can't be avoided (fridges and cellars need to stay cool!) but trying to minimise this can have a massive impact.

Try turning everything off until your baseload is zero – once this is achieved, switch essential equipment back on. This will be the minimum achievable baseload for your pub. Consider installing a 'kill switch' which turns off all loads that are non-essential at the end of a shift. This will need the services of an electrician but it provides a simple and reliable way to turn off equipment. Make it easy for yourself and staff and it is more likely to happen.

Low Cost (£1k)

This section runs through things that can be done at a low cost. Some of these actions such as LED light replacement have big impacts and will quickly pay for themselves, but none should be too expensive.

LED Lights

Lighting contributes a major part of a pub's energy bill, with between 20-30% coming from lighting alone. To minimise the cost associated with lighting, make sure to replace any outdated lights with modern LEDs, which are much more efficient than older styles. In most cases, this is a like-for-like switch, and no work is required on-site.

Did you know:

A 50W light currently costs about £30 per year to run.

LEDs are extremely efficient compared to older styles of lights. An equivalent LED light could save you £25 per year meaning this opportunity will pay back in less than a year.

What you can do:

When replacing lights, see if there is an LED version which can be directly replaced without changing the fitting, these can then be picked up from your local DIY store. If you've already got LEDs, make sure you replace like-for-like when these fail.



Draught Proofing

Taking some time to look out for gaps and holes where there shouldn't be and filling them in is a quick, easy and cheap way to reduce your bills.

Did you know:

Draughts constantly wick away heat from buildings, and can be simple to find. A single draughty window can easily cost an extra £10 a year on your heating bill. While this seems small, fixing this is likely to be less than the cost and so pays back quickly. Fixing all draughts will likely lead to a noticeable saving.

What you can do:

Old wooden framed windows tend to be particularly leaky – if you can't replace these, consider buying some clear film from your local DIY store, this can create an air barrier between the windows and the inside of your building. Self-adhesive brush strips are also effective and easy to fit and can also be applied to doors.

Just remember! Some air gaps serve a purpose and help prevent damp. Air bricks help to circulate air and stop condensation problems, so don't fill these in.

Removal/Segregation of Heat Generating Equipment

Cold equipment like ice machines and fridges are often installed in cellars. This seems to make sense; however, this equipment actually produces heat, meaning you're taking a double hit, paying to produce ice, which puts heat into your cellar, which you then have to pay to cool back down using your cellar cooling!

Did you know:

Moving a fridge out of the cellar could save £100/year in additional cellar cooling costs, while ice machines and freezers are worth £200/year.

What you can do:

Check your cellar! Do you have any fridges, freezers or ice machines in there? If you have an area where these can be moved to it's a simple fix and can lead to a real difference on your annual bills. If there isn't a good area to move these to, or if moving plumbing for ice machines is expensive, consider segregation of the equipment. Ideally this would involve installing an insulated partition, however if a simple fix is needed, even plastic strip curtain will provide some benefit.

Just the simple step of moving your freezers could have a noticeable difference on your electricity bill.

TRV's & Heat Zoning

Heating systems should be designed to only put the heat where it's needed. Temperature Regulating Valves (TRV's) allow you to turn off your radiators and not waste energy heating an area of the pub that isn't being used.

Did you know:

Zoning the heating within your building can lead to savings, particularly for those with areas that are largely unused. This could include function rooms and accommodation areas, saving you up to £40 per year. Seeing as they cost in the range of £10, these pay for themselves after 3 months if used.

What you can do:

Check to see if you have TRV's installed, if you don't, reach out to a heating engineer. These will typically payback within the year (assuming the space is unused and currently heated). Modern systems can be 'smart', helping you remember to change the valve settings or automatically changing valve settings for you. Just remember that automatic systems will be more expensive for what is the same benefit.

Once installed, make sure you use them correctly by turning down the heating in areas which aren't being used. If you have function rooms or accommodation, these can be turned down when not in use. Consider turning the TRV's down a small amount each day to find the balance point of comfort and not overheating.

It's possible that guests may change these, so make it part of your morning/evening routines to check the positioning. Make this obvious, by drawing a line on where the valve should be set to or fit 'anti-tamper' TRV heads that can be locked in position.

Heat Lamps

Nearly one in three kitchens with heat lamps do not turn them off when not in use. Heat lamps use large amounts of energy and are often turned on much earlier than service starts.

Did you know:

Heat lamps are inefficient – switching these off when food isn't being warmed can have significant savings.

What you can do:

Quite simply, making sure lamps are only on when food needs to be kept warm will help make this saving.

To calculate your current costs:

Cost = No. of lamps x Watts/1000 x hours on per day x cost of electricity (£/kWh)

Five 300 Watt lights on for 10 hours per day, with a cost of 25p/kWh will cost £1000 each year.

Make sure your switch is labelled and located in an easily accessible place for use during service.

If you need to prewarm plates, consider how long the plate might take to warm up before service. If this is only 5 minutes, only switch the lamps on 5 minutes before serving.

Extract Systems

Extraction systems are one of the larger energy consumers in a pub, as you pay for running the fan and reheating any hot air that gets removed.

Did you know:

If your extraction fan is fitted with a variable speed drive, turning the fan down to 75% speed will halve its energy use.

What you can do:

If you have a variable speed drive, talk with catering staff to understand if there are limitations to turning down your extract, and what your minimum speed is to prevent gas shut off. Contact your supplier if gas shut off at low speed is a concern.

Marking an appropriate speed on the dial can help guide staff to change the speed during different levels of service.

Hot Water System Insulation

This is one of the simplest ways to save some energy. Pubs often have uninsulated hot water pipes, meaning heat is lost on its journey around the building. Ultimately this means that when you turn on your radiators, not all the heat makes it, meaning your rooms stay colder for longer.

Did you know:

This is possibly one of the simplest and cheapest steps you can take to minimise your energy. Foam pipe insulation can be picked up from your local hardware store at extremely low prices, in the range of £1/m for standard pipe sizes.

What you can do:

Investigate to see if there are any obviously exposed hot water pipes, particularly outside the building or running through the cellar, as these will be exposed to the coldest temperatures, meaning more heat gets lost. If you do, pick up enough insulation to cover as much of the pipe as possible and simply slot it around the pipe

Air Conditioning Setpoints and 'Deadbands'

If you have air conditioning and heating in the same room, the two systems can work against each other. This happens when the two systems are set to operate at similar conditions, where the heating is trying to raise the temperature, while air conditioning is simultaneously trying to lower it.

Did you know:

The average air conditioning unit will cost approximately £1.50 per hour, while the average boiler will cost £3. This means that if operating at the same time, you could spend approximately £4.50 per hour for no benefit.

What you can do:

A simple solution is to have a minimum difference of 4°C between the set points of the two systems. This means if you have your heating thermostat set to 19°C, your air conditioning should be set to no less than 23°C (and could be higher, such as 25°C).



Medium Cost (£1-5k)

These actions are slightly more expensive, in most cases they still pay for themselves within a reasonable time, but may cost more upfront.

Insulation

Most pubs tend to have poor insulation, which has significant opportunity for improvement. There is then a hierarchy of what insulation tends to get the best benefit. Following this will help to improve your buildings thermal efficiency.

The Insulation Hierarchy:

1. Draught Proofing
2. Loft insulation
3. Suspended floors
4. Windows
5. Wall Insulation

What you can do:

Try and see how your pub is built, can you feel cold draughts anywhere, and do you have a reasonable amount of insulation in the loft space? Are your windows single or double glazed?

Gaining insight into how energy escapes your building will allow you to target the areas that will offer the most significant payback.

It's always a good idea to have a specialist review where your best opportunity for insulation is, as sometimes there can be issues around condensation causing damp problems.



Cellar Insulation

Cellars are often forgotten when it comes to insulation. Minimising heat transfer into your cellar can lead to savings by isolating the cellar from the rest of the building and the outside world. This opportunity is particularly relevant when your cellar isn't underground.

Did you know:

Cellars which have poor insulation can cost £150 a year more to cool than those which are well insulated. Depending on where the cellar is positioned, energy can be leached into other parts of the pub, which will then have a cost to reheat.

What you can do:

A cellar survey can show where insulation can be improved. Check for hot water pipes running through the cellar and make sure these are insulated, and confirm that walls are clad. Look for holes, or poorly fitting doors, making sure doors are always closed. Fitting simple measures such as self-closing doors can have a reasonable impact.

Simple fixes can be inexpensive and implemented by a handyman. If walls and ceilings need to be clad, this can be more expensive, however confirm if government funding can be utilised to help bring down insulation costs. Depending on the amount of work required and cellar layout, paybacks can be as low as a year.

Remote Cooler Controls

Remote beer coolers provide cooling for drinks, but often these are left on at times when the pub is empty.

Did you know:

A ten-product remote cooler will cost about £650 per year to run. If the system can be switched off out of hours, this could represent a £200 saving.

What you can do:

Installing timer devices or energy-efficient top pumps can control the remote coolers according to either predetermined time schedules or demand for drinks. An alternative methodology would be for the units to be intelligently controlled remotely as an entire integrated cellar energy and conditioning monitoring system.

High Cost (>£5k)

These are the actions to take if you've managed to tick off those earlier in the list. These tend to have a high upfront cost but can have high paybacks. Included here are technologies which may have a significant impact on your carbon footprint too, such as heat pumps and solar panels. Before committing to these solutions, make sure to do some research as to whether these are right for you.

Boiler Upgrades

In a food-led pub 50% of gas goes into heating your building and hot water, while wet-led pubs use closer to 80%. For most pubs this heat is produced by burning natural gas in your boiler, making boiler efficiency critical to overall building efficiency.

Did you know:

Your boiler will consume most of the gas at your pub. As boilers age they become less and less efficient, and will eventually require replacement. Upgrading a boiler which is 15 years old could cause your heating energy consumption to drop by 20%. At current energy prices, an £8,000 boiler would pay for itself within 4 years.

What you can do:

Make sure you get your boiler regularly serviced. This will make sure that it's working as efficiently as possible, and heat isn't wasted. If your boiler is 10-15 years old it's worth considering replacement, current energy prices may make this a better investment than you think.



Heat Pumps

When it comes to energy efficiency, heat pumps use about a third of the energy of boilers. However, because the price of electricity tends to be much higher than gas, this comes out to a similar cost overall.

Heat pumps have been included in this guide, as a viable way of reducing energy and will become more common over the coming years, however take some time to consider if this is the right choice for you.

Did you know:

Heat pumps are just fridges working in reverse. Your fridge takes heat from inside of it and rejects it into your kitchen. A heat pump does the same, taking the heat from the outside air, water, or ground and 'rejecting' it into your heating system.

Because heat pumps are taking heat from the area around them, you only pay for the electricity to run them, which is normally about a third of the heat they provide.

This means that if your annual gas consumption for heating is 6,000kWh, your electricity consumption with a heat pump, to give the same heat would be less than 2,000kWh.

What you can do:

Do some research into if a heat pump is right for you. This will mostly come down to upfront cost, as they're currently expensive and may require a revamp of your heating system. As the market grows, heat pump costs should come down

Solar Panels

Over the past 10 years solar panels have significantly dropped in price. Solar PVs generate electricity when the sun's shining, which can be used directly in the pub. This means once the panels are installed, you'll see a drop in your energy bills.

Did you know:

Utilising an average pub's roof space for solar panels could generate 3,600kWh a year. At current electricity prices, this would save about £800 per year, meaning that the panels would pay for themselves after 7 years, generating free electricity after this. As a bonus, this electricity is zero carbon.

What you can do:

To make solar panels worthwhile, you need to make sure that they aren't oversized compared to the amount electricity you consume, as you'll have to give the electricity you don't use to the grid for a lower rate. Solar installers can help you size the array to make sure that you aren't exporting too much.

Free Cooling in Cellar

When the temperature drops outside, traditional cooling equipment continues to operate in the same way it always does, using large amounts of energy to move heat from inside the cellar outside.

It's much more efficient to use the outside air, blowing this directly into the cellar. This is a simple solution but very few cellars are set up to allow this to happen.

Did you know:

Free cooling is just that - (almost) free cooling. The only running cost is the energy to move the cold air from outside, to inside.

What you can do:

Firstly, check to see if your cellar already offers this functionality. If it doesn't and your current system is over 15 years old, reach out to a refrigeration engineer. It could be that installing one of these systems could provide significant savings.

Gas Hobs

While gas hobs aren't the most efficient way of cooking, they are the most common. Replacing this equipment is expensive and unlikely to payback, so until it reaches the end of its life, make sure you're using it efficiently.

Did you know:

The average gas hob will only transfer 40% of its energy to the food being cooked, the rest of the heat goes to places you don't necessarily want it, such as heating up the kitchen and equipment.

What you can do:

Only start turning on gas hobs when food needs to be cooked and turn it off as soon as cooking is finished. Gas hobs often get left running when no food is being prepared, wasting energy and creating an uncomfortable working environment. This saving comes down to educating staff on the cost of leaving the hob on. If your staff are finding the kitchen cold, there are more efficient sources of heating which should be investigated – just remember to switch them off when the kitchen's hot!

Induction Hobs

Kitchens use approximately 40% of the gas in an average food-led pub. The issue with gas equipment is that most of the heat that you pay for doesn't end up in the food. Instead, it is lost to the surroundings, whether it's heating up the air and equipment in the kitchen, or sent out the exhaust of the extraction system.

Did you know:

Induction hobs put up to 90% of the energy used directly into the food and don't require gas interlocking with the ventilation system. This makes a maintenance saving, and means in many situations, the cost of using an induction hob is equivalent to gas.

What you can do:

Induction hobs are currently expensive, and are unlikely to pay back their initial cost, so if your equipment is nearing it's end of life, consider if upgrading to induction is right for you.



Accommodation

The following section is aimed at problems unique to pubs which offer guest accommodation.

Electric Radiators & Towel Rails

Current electricity prices make this one of the most expensive ways of producing heat. Electric equipment produces the same amount of heat as regular radiators, but cost you almost 3 times as much.

Did you know:

In the UK, the cost of electricity is currently tied to the price of gas, meaning an electric system will always be more expensive to run than a gas equivalent (unless you're self-generating).

As an example of the difference in cost between electric radiators and a gas fired central heating system, to produce 10kWh of heat, a gas boiler would cost £1. An electric system on the other hand would cost approximately £2.50.

What you can do:

The simplest solution is to try and minimise the use of these expensive systems.

Ideally, timer switches can be installed which turn off the radiators after a certain amount of time, this will make sure that even if these are left on by accident, they'll turn off, which prevents overuse.

Alternatively, making sure that switches are in prominent locations and clearly labelled will help to remind people to switch these off.

Occupancy Sensors / Key Activation

Hotel guests will often forget to switch off small electrical items when they're out for the day. This can be a large expense for hotel operators as equipment is left running.

Did you know:

The annual cost of leaving a TV and towel radiator on in hotels for 3 hours a day is approximately £50 for each room. In an average pub with rooms this can quickly add up.

What you can do:

When next going through a refit, consider installing occupancy sensors, or key card activation of equipment, which only powers sockets when guests are in their rooms. This can be a simple way to make sure that equipment isn't running when it's not needed.

There are more complex solutions, involving building management systems, however these are best investigated as there can often be extended paybacks on this equipment.

Hot Water Sterilant Technology

Traditionally, water is kept above 60°C to eliminate the risk of legionella. Sterilant technology eliminates this risk and allows the water flow temperature to be lowered, saving energy. It will likely only be worthwhile for those with greater than 20 rooms.

Did you know:

Sterilant technology allows water temperatures to be lowered, reducing your energy consumption. It should be noted that this saving will depend upon the relative cost of energy to the chemicals dosed and should be worked out on a case by case basis.

What you can do:

If you have more than 20 rooms and your hot water is generated centrally, this technology may be worthwhile for you. The most common technology is to treat your water with chlorine dioxide. There are many suppliers of this technology, reach out to some to understand if this technology is right for you.

Low Flow Taps & Showers

Reducing the flow rate through your taps and showers can lead to savings the use of hot water (and therefore energy). However, watch out for claims that hot water use will be halved, as often guests may increase the time that water is used.

Did you know:

Low flow showerheads and taps can reduce hot water consumption by 50%, which for a shower could save £100 per year, per shower. Just be careful that flow rate isn't restricted to the point that guests feel they need to stay in the shower for longer.

What you can do:

Test to see if your fittings are low flow:

Put a 10-litre bucket under the showerhead and time how long it takes to fill. If it's full after less than a minute this opportunity applies to you.

Items that Aren't worth the Money

We often see people talking about the latest and greatest in technology, but when you look at the costs, you see these projects will never pay back their initial outlay. Some of these are summarised below.

Micro Wind

While a great idea, wind turbines gain efficiency with size and so small, roof mounted turbines will be high cost and low payback.



Radiant Wallpaper

In general, using electricity to heat an area will be cost inefficient. Radiant wallpaper offers an opportunity to increase working area, however currently comes at a high price.



Be aware of claims that seem too good to be true

If someone is claiming that their equipment or solution gives savings and paybacks that seem too good to be true, chances are they are. Take time to consider whether all of the facts are being given and ask for evidence of savings before committing to anything new.

Straight Talking. **Solutions Focused.**



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