Poppins Appliance Repairs

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Should I use my Air-fryer or Oven, Microwave or Hob?
A simple guide (hopefully!) on how to work out the cost of using an appliance

There are three ways to do this:
A. If you have a smart meter then the separate in-home display (IHD) will give you a guide to your current usage. You could switch everything off except for the appliance in question.
B. You can purchase or borrow a plug-in consumption meter which will give you an accurate and exact reading of what the appliance plugged into it is using.
C. You could work out what the appliance is using by following the process below.

Remember:
1 unit of electricity on your meter is the same as using 1kW of electricity or 1000W
A unit is 1 number on your meter (usually white) before any decimal point shown or any little red dials/numbers on an older meter.
Your electricity bill is based on you paying for every unit you use (plus 5% VAT currently) as well as a daily standing charge for having the connection in your home and to the infrastructure.
Check how much you are paying per unit by looking at your latest bill.

How to work out how much electricity my appliance uses.

1. Firstly, find the rating label on the appliance. It will usually be on the back, underneath, around the door opening or somewhere like that. Hopefully, it will have details about it's power usage. If it doesn't then see the next page for 'What to do if I can't find my rating label'.
2. On the rating label may be details such as Volts (V), Amps (A), Watts (W), Kilowatts (kW) or Kilowatts per hour (kWh). Write these down for each appliance you want to check.
3. Depending on what information you have depends on how you work out the consumption. Ideally you want the Watts or Kilowatts. If it gives a Kilowatts figure e.g. 1.5kW then it means it will use 1.5 units of electricity **per hour**. If it gives a Watts figure e.g. 800W then work out the units or kilowatts used by dividing by 1000 so in this case 800 ÷ 1000 = 0.8. So this appliance uses 0.8 of a unit **per hour.**
4. If the label only gives the Amps e.g. 10A then you work it out by multiplying by 240(V) and then dividing by 1000. In this case for example 10 x 240 = 2400. So, 2400 ÷ 1000 = 2.4. So this appliance uses 2.4 units **per hour** (This is approximately if using Amps as a measure).
5. Once you know how many units or kW per hour an appliance uses then multiply it by your price per unit found on your bill. e.g. 2.4 units x 35p/unit = 84p per hour

From this process above you can gauge how many units of electricity your appliance uses per hour and then multiply by the cost per unit given by your supplier so that you know how much the appliance costs per hour to run. It's not as accurate as say using a plug in power consumption meter as the process above does not take into account heating elements and motors etc. coming on at different times when using the appliance but at least you will have a good idea.

What to do if I can't find my rating label or it doesn't have V, A, W or kW figures on it?

You may be able to get the exact details if you type the model number into the manufacturers website or from the retailer you purchased it from. Unfortunately this is very difficult for fridges and freezers as they will tend to give an average annual consumption rather than an exact wattage. Usually the rating plate is inside the fridge/freezer on either of the side walls by the shelves at the top or quite often hidden on the side by the salad drawer or the lowest drawer.

For other large or built-in appliances the user manual often has a section that gives a breakdown of usage for key components e.g. grill, oven, hob, element, pump etc.
Alternatively here are some average consumption figures (in kW or units per hour) for common appliances (in no particular order) to use as a guide.
Remember that this is **per hour** and worse case as most appliances will have thermostats and programming that mean that it will not always be at full energy use all of the time. You will also need to take into account how long the appliance is on for including pre-heating time (if appropriate). **The price range in brackets is based on the average price in the Dyfi Valley and surrounding area of 32p/unit following a small survey conducted April 22.**

Built-in fan oven 1.6 to 2.5 kW (51p-80p)
Built-in non-fan oven 2 to 4 kW (64p-£1.28)
Microwave oven 0.6 to 2 kW (19p-64p)
Dehumidifier 0.02 to 0.3 kW (1p-10p)
Air-fryer 0.8 to 3 kW (26p-96p)
Halogen oven 0.8 to 2 kW (26p-64p)
Multi cooker 0.8 to 1.4 kW (26p-45p)
Slow cooker 0.1 to 0.4 kW (3p-13p)
Rice cooker 0.5 to 1 Kw (16p-32p)
Breadmaker 0.5 to 0.8 kW (16p-26p)
Steamers 0.7 to 1.8 kW (22p-58p)
Portable grill 0.7 to 2 kW (22p-64p)
Coffee/Tea machine 0.5 to 1.5 kW (16p-48p)
Kettle 0.8 to 3kW (26p-96p) *(see kettle section)*
Popcorn maker 1 to 1.2 kW (32p-38p)
Soup maker 0.8 to 1.1 kW (32p-35p)
Food mixer 0.08 to 0.4 kW (3p-13p)
Table stand mixer 0.3 to 1.2 kW (10p-38p)

Table top mini fan oven 0.8 to 1.5 kW (26p-48p)
Table top mini non-fan oven 1 to 2.5 kW (32p-80p)
Sandwich/Panini/Waffle/Omelette maker 0.8 to 1.4 kW (26p-45p)
Iron and Steam generators 0.9 to 3.2 kW (29p-£1.02)
Induction Hob (per cooking zone depending on setting from low to high) 0.1 to 3 kW (3p-96p)
Hob (per cooking zone depending on setting from low to high) 0.8 to 2.5 kW (26p-80p)

Convector heater 0.8 to 2 kW (26p-64p)
Oil filled radiator 1 to 3 kW (32p-96p)
Halogen heater 0.4 to 1.8 kW (13p-58p)
Radiant infra red heater 1 to 3 kW (32p-96p)
Fan heater 1 to 3 kW (32p-96p)
Vacuum cleaner 0.6 to 2.4 kW (19p-77p)
Fridge and/or Freezer 0.1 to 0.4 kW (3-13p)
Electric shower 6 to 10.8 kW (£1.92-£3.46) *(see section on electric showers)*
Gas/Oil Boilers (for motors, pumps and control not for the gas or oil) 0.1 to 0.45 kW (3p-15p)

So should I use my air-fryer or oven, my microwave or hob?

In essence, without getting too bogged down into the science and particularly physics of it, it all depends on how much the appliance consumes and for how long and how your own particular appliance is rated for energy use. A typical 1.8 kW fan oven (as part of a cooker) is cheaper to run for the same time than a 2.5 kW air-fryer. Some air-fryers won't be as well insulated as a normal oven but the heating element may not be on for as long as it is heating up a smaller space. You can get

more into a standard size fan oven however. If your air fryer was rated at 1.8kW and your fan oven 2.5kW then your air-fryer would be cheaper to use for small quantities.

Similarly on a double oven the top (often) smaller conventional oven uses the grill element as well as an element in the floor which together can be around 2.5 to 4 kWh. Taking into account the conventional oven has to be preheated for longer as it is slower to heat up (physics again!) compared to a fan oven that forces the heat around, the larger 1.8 kW fan oven is cheaper to run! Similarly small table top mini ovens are not always cheaper to run than a standard fan oven. You have to check their rating and decide for your own equipment.

Microwaves (this is not the place to discuss any potential side effects if any) are often a cheaper way to heat up a product compared to a hob as they are more efficient at getting heat energy into the food rather than heating a saucepan and conducting the heat through (unless it's a gas or induction hob even with today's prices still). On the other hand if you need to cook something for a longer period of time, once boiling its cheaper to have the electric hob on low simmer setting for 30 mins than blasting away for 10 minutes in the microwave on full.

Other things to consider

We all know about only boiling as much water in the kettle that we need and closing curtains to conserve heat and so on. In fact, I'm sure we can all come up with many clever and practical ways to save energy more so than can be listed here however in today's electronic and digital age, do be aware of the silent (and not so silent) users of energy. In days gone by appliances and gadgets had an ON/OFF switch that had to be physically moved by either pressing, rocking, rotating or moving sideways. These always shut the power off completely. Today's digital equipment and appliances often only have a light push or touch button to switch it off. It still needs power though to know you have pressed it! This is often referred to as standby or power off consumption. Therefore if you want to save a bit more **WHEN NOT USING AN APPLIANCE SWITCH IT OFF AT THE MAINS PLUG** to be sure it's not continuing to use a small amount of energy 24 hours a day waiting for you to press the ON button!

What about my kettle?

Over the past decade many kettles have become very powerful at 3kW which makes them very quick to boil. If regularly used for small quantities of water they have a tendency to 'overheat' when poured which puts extra pressure on thermal cut outs and connections (you'll hear a click of the cut out when pouring) meaning that they fail much sooner than expected so you end up replacing the kettle within a few years as they often cannot be repaired economically if at all.

Always fill to at least the minimum level. If you regularly only require one or two cups then make sure the kettle can do this and consider a kettle of lesser wattage to prevent overheating. The time difference for small amounts is only a little more and the amount of energy required to boil a single cup the same (assuming the water starts from the same temperature). If you regularly require water for three or more cups then a more powerful kettle is beneficial. Below is a chart for typical kettle costs in minutes based on the Dyfi Valley average of 32p per unit (figures rounded to 0.5p).

	1 min	2 mins	3 mins	4 mins	5 mins	6 mins	7 mins	8 mins	9 mins	10 mins
1 kW	0.5p	1p	1.5p	2p	2.5p	3p	3.5p	4p	4.5p	5p
2.2 kW	1p	2p	3.5p	4.5p	6p	7p	8p	9p	10.5p	12p
3 kW	1.5p	3p	5p	6.5p	8p	10p	11p	13p	14.5p	16p

Electric Shower

If you can't find the rating label then most showers will often say on the front what wattage it is. Below is a table detailing how much up to 30 minutes continual use a shower would cost depending on its power rating based on the average Dyfi Valley price of 32p/unit (April 22) at 5 minute intervals.

Rating (in kW per hour)	6.5	7.5	8.5	8.7	9.0	9.5	9.8	10.5	10.8
5 mins use	18p	20p	23p	23p	24p	25p	26p	28p	29p
10 mins use	35p	40p	45p	46p	48p	51p	52p	56p	58p
15 mins use	52p	60p	68p	70p	72p	76p	78p	84p	86p
20 mins use	69p	80p	91p	93p	96p	£1.01	£1.05	£1.12	£1.15
25 mins use	87p	£1.00	£1.13	£1.16	£1.20	£1.27	£1.31	£1.40	£1.44
30 mins use	£1.04	£1.20	£1.36	£1.39	£1.44	£1.52	£1.57	£1.68	£1.73

What about my washing machine, dishwasher and tumble dryer consumption?

These machines are often blamed for being the high-energy users when in fact their usage is more fixed and predictable say compared to a television on standby or a fridge or freezer (which are incredibly high energy users….that's for another document!)
In a nutshell, **If you are not in a hurry then run your appliance on it's ECO cycles at the lowest temperature you're happy with to save energy.**

Our lifestyles usually mean we want these machines to be as quick as possible. However, just because the appliance has a quick cycle doesn't mean it's the most efficient in terms of energy and water usage. Often the quick washes are more expensive to run and less efficient in terms of washing, rinsing and drying/spinning. You can work out how much these approximately use by the method stated previously but this doesn't take into account that the main energy using part is the heating element during the wash/drying process. The figure you come up with will be the energy use at it's worst so at least it's something to go by as a rough guide.

Tumble dryers ARE heavy users of power as you are running both a heating element as well as a motor for nearly the whole cycle. On saying that they can't use any more than their consumption listed on the rating plate so a 3kW rated tumble dryer for example cannot use any more than 3 units per hour. So a typical load of towels taking 90 minutes would use 4.5 units which at 35p per unit is about £1.58. A tumble dryer typically costs £1 per hour at current prices (April 22). Heat pump tumble dryers are far more efficient energy wise saving 50-75% but can take up to twice as long to dry a load.

For washing machines and dishwashers check your user manual as manufacturers will often list the kW usage for different cycles under different load quantities. The lower the kW figure, the cheaper the cycle is to run. You may be surprised at the results! Often the longest ECO cycles which seem to go on for hours can be the cheapest to run. This is because the machine is designed/programmed (by a legal standard) to give optimum wash/rinse/spinning results using the least amount of water and energy but they need TIME to do this. Any machine younger than 17 years will have this legally required programme cycle.

On QUICK cycles the machine will often fill as if it's a full load, heat up the water and try and do everything as quickly as possible given the circumstances. Conversely, on ECO cycles the machine will only heat once to the stated temperature for at least 5 minutes during the wash and then at a lower temperature, but wash/soak for MUCH longer as it's cheaper to run a motor compared to a heating element. On a NORMAL programme the machine will maintain the selected temperature throughout the wash process which is very useful if you are sterilising at 60°C or washing dirty/grubby clothes at 30/40°C so the heating element is regularly switched on.

Modern washing and dishwashing machines can also monitor the whole process and adjust according to the amount of clothes/dishes, how dirty the water becomes and the amount of suds produced as long as they have TIME to do it. If your machine has a digital display you may see it change the cycle time sometimes because of this especially with small loads.

Listed below is an example of typical prices per programme type for different washing and dishwashing machines across a range of manufacturers. Your own user manual for your appliance will give the most accurate consumption figures between the different cycles and programmes. **If you have a dual tariff (such as Economy 7) or a smart meter with multiple tariffs (such as the Machynlleth Energy Local Scheme) then try to get at least the wash part of the cycle (where the heating occurs) in the cheaper tariff** even if the rinsing and spinning section of the cycle can't be. This is harder with a dishwasher as there are two heating phases in the cycle to help wash/dry the dishes so it's best to get the whole cycle on the cheapest tariff if you can.

For a washing machine at current prices at the time of writing a typical QUICK cycle costs 15p which is the same price as a 40°C ECO cycle which has far superior results.
A typical NORMAL 60°C cycle could cost between 42p to 49p
A typical NORMAL 40°C cycle could cost between 15p to 42p
A typical NORMAL 30°C cycle could cost between 10p to 40p
A typical NORMAL 20°C cycle could cost between 8p to 30p
A typical NORMAL cold wash could cost between 8p to 22p

If your washing machine doesn't say ECO then any programme that shows a temperature (usually 40°C and/or 60°C) within a left or right pointing arrow box will be the ECO programme cycle rated according to legal requirements.

For a dishwasher at current prices at the time of writing
A typical QUICK cycle could cost between 33p to 46p
A typical ECO cycle could cost between 25p to 30p
A typical INTENSIVE cycle could cost between 31p to 51p
A typical NORMAL cycle could cost between 25p to 36p
A typical AUTO cycle could cost between 26p to 38p

The ECO cycle is the cheapest to run usually but if your dishwasher has an AUTO cycle then the machine will adjust the cycle automatically including the temperature it aims for, depending on the amount of dishes and how dirty they are (they have clever sensors). When items are greasy it's best to wash at temperatures of 60°C and above otherwise everything could come out with a 'slime' on it particularly plastic ware as the sensors cannot as yet work out a greasy load but they are getting better.
Unless you are really diligent at only using a small amount of water for washing dishes and may be your water was heated on demand and didn't have far to travel through the pipes, it is cheaper and

more efficient to wash dishes in a dishwasher compared to washing by hand. Depending on the make and model, most modern dishwashers can now complete a whole cycle using only 6 to 12 litres of water. A typical normal cycle consists of a cold pre-rinse, hot wash, cold rinse and hot rinse to aid drying so it's actually only heating 3 to 6 litres of water. Most kettles hold 1.5 to 2 litres of water and a washing up bowl holds between 8 to 12 litres.

I hope you found all of this useful. Let me know if there are some appliances missing off the list above that you would like included or other chart information that may be helpful.
If there is other information that may be of use to help you keep on top of being able to use energy efficiently and economically, please do let me know. I suspect this document will evolve over time.

Best wishes
Chris
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