



Invisible Electricity

... or what we use without even thinking about it



Switch your TV off at the set, not on the remote control . . . only put as much water in the kettle as you actually need . . . They're good pieces of energy-saving advice, and feature high in most lists of how to reduce domestic energy consumption. If everyone in the UK switched off their TV at the set rather than leaving it on standby, the country would save the equivalent of one small power station's energy output.

That's based on the average TV set drawing about 6.5 watts of power when it's on standby. With 39 million sets in the UK (assuming an average of 1½ sets per household), that comes to over 250 megawatts if they're all on standby. In turn, that would produce just short of a million tons of atmospheric CO₂ per annum¹ if every TV was on standby 24 hours a day. As for boiling the kettle, I'll come to that later.

Anyway, I always switch the TV off at the set. Well, . . . most of the time. But then I started thinking about all the other things in the house that are constantly drawing power from the mains. Like the radio alarm, the cordless phone, the fax machine and the clocks on the microwave and the cooker. Not to mention the burglar alarm.

After a quick audit of all these items, I realised that the TV was just a small part of my invisible electricity consumption. Not counting the power that these appliances draw when they're actually doing what they were bought to do, like cooking supper, recording East Enders or waking me up in the morning, their constant rate of energy consumption is shown in the table.

Appliance	Standby Power (watts)	Annual Energy Consumption (kilowatt hours)	Annual CO ₂ (kg)	Annual Cost (at 12p per kW hour)
Fax machine	5.00	43.80	18.83	£5.26
Radio alarm	10.00	87.60	37.67	£10.51
Cordless phone	10.00	87.60	37.67	£10.51
Electric toothbrush	5.00	43.80	18.83	£5.26
Microwave oven	8.00	70.08	30.13	£8.41
Cooker	5.00	43.80	18.83	£5.26
Stereo	5.00	43.80	18.83	£5.26
TV	6.50	56.94	24.48	£6.83
Video recorder	7.50	65.70	28.25	£7.88
Answering machine	5.00	43.80	18.83	£5.26
Rechargeable torch	5.00	43.80	18.83	£5.26
TV aerial booster	4.00	35.04	15.07	£4.20
Doorbell transformer	15.00	131.40	56.50	£9.86
Outdoor light sensor	10.00	87.60	37.67	£6.57
Central heating system	5.00	43.80	18.83	£3.29
Burglar alarm	25.00	219.00	94.17	£16.43
Totals:	131.00W	1147.56kWh	493.42kg	£116.05

So leaving the TV on permanent standby uses about 57 kWh of electricity in a year and creates some 25 kilograms of atmospheric CO₂. But switching off the TV while leaving all the rest of these appliances plugged in uses over 1100 kWh of electricity, and produces nearly half a tonne of atmospheric CO₂. It also accounts for about 15% of my total electricity bill.

Even more worrying is the fact that some appliances draw power even when they seem to be completely switched off. While researching her MSc thesis at Oxford University's Environmental Change Institute, Julia Vowles tested a range of ordinary domestic appliances and found that many of them constantly draw a small current². Things like hairdryers, toasters, dishwashers and washing machines all used electricity even when apparently switched off.

One category not included in Vowles' research was computer equipment. Any device with a separate mains transformer (the ones that look like overgrown 3-pin plugs) draws a small current

all the time it's plugged in, unless you switch it off at the socket. Typically that includes your printer, scanner, speakers and most other peripherals. A rough check of my own computer system suggests that when it's not being used, it consumes about 15 watts if I don't switch it all off at the wall.

But going back to that kettle ... if I fail to follow good advice, and boil twice as much water as I actually need each time I make a mug of tea (600ml instead of 300ml), the kettle consumes an extra 30 watt-hours of energy. Do that 5 times a day every day for a year and I use an extra 53 kWh of electricity – slightly over half what my radio alarm uses.

So while not over-filling the kettle is an easy saving to make, shouldn't we perhaps also think about all those other gadgets that are doing little more than flashing the wrong time at us while they warm up the planet?

Fred Foxon, October 2002 (updated March 2007)

¹ Mains electricity produces around 0.43 kg of CO₂/kWh (see <http://www.defra.gov.uk/environment/business/envrpgas/envrpgas-annexes.pdf>).

² *Suspecting Standby? Domestic levels and the potential for household-level reductions in the UK*. Published in *European Council for an Energy Efficient Economy, 2001 Summer Study Proceedings*, Volume II: 107 – 117.