



HALCYAN WATER CONDITIONERS

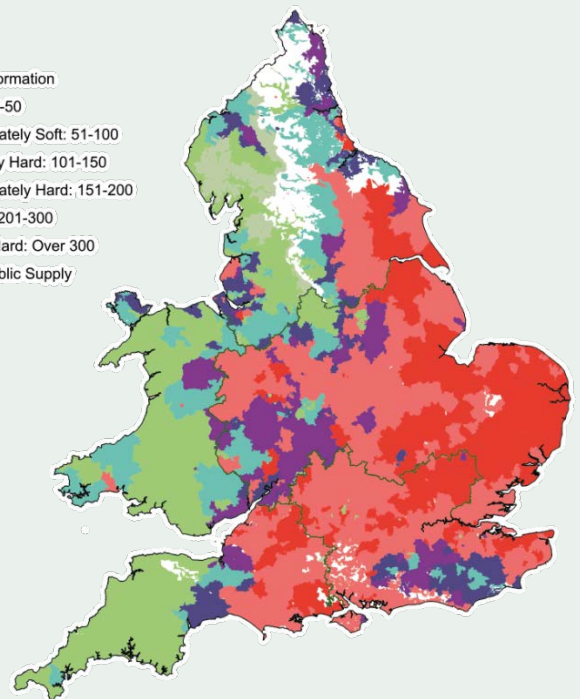
Residential & Commercial Energy & Carbon Calculations

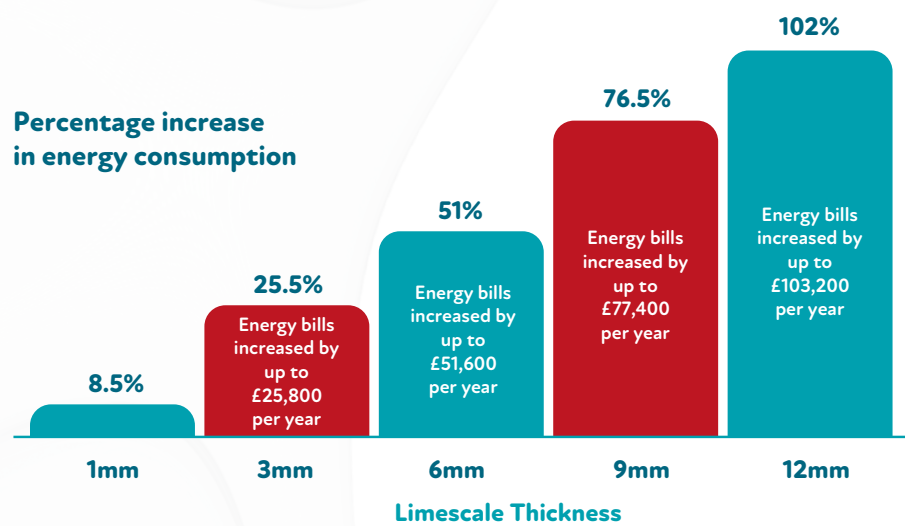
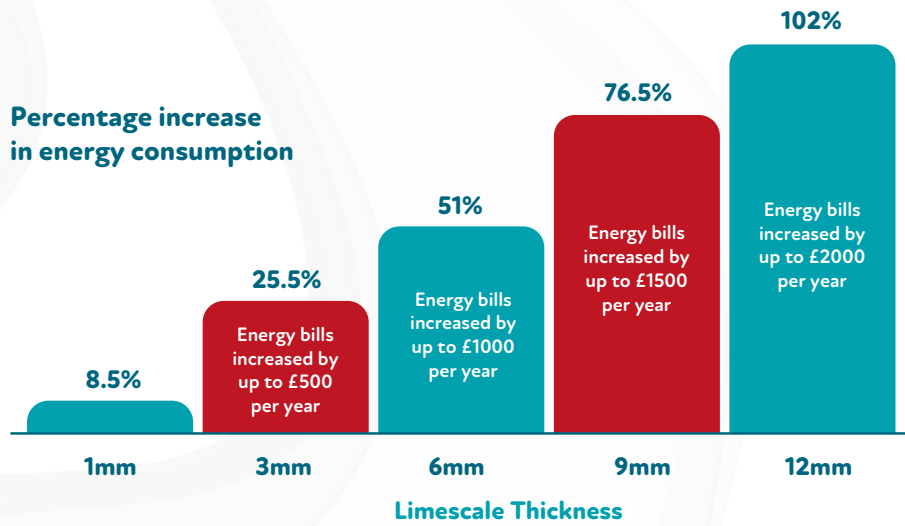
HARD WATER

The invisible enemy in residential and commercial buildings.

Hard water affects 60% of UK dwellings and businesses and, while causing considerable damage to appliances, fixtures and increasing maintenance costs, it also has a highly significant impact on energy usage and fuel bills. To put that into perspective, **just 3mm of limescale build-up** on the heating elements of appliances means they **will use at least 21% more energy***, making energy bills substantially higher than they should be. With the cost of energy skyrocketing, this will be adding hundreds or thousands of pounds to the utility bills of homes and businesses every single year.

*British Water





Example savings for residential dwellings and businesses:

Residential



A family living in a new-build home can reduce their carbon emissions by 0.7 tonnes per year, and up to £500 on their energy bills – that's £15,000 over 30 years by treating their hard water effectively and sustainably.



A couple living in a pre-1950s home can save up to £1,200 on their electricity bills, while also cutting their carbon emissions by 0.6 tonnes – that's £36,000 over 30 years.

Commercial



A Commercial Office with 105 staff can save approximately 15.7 tonnes of carbon emissions every year and up to £8,300 a year on utility bills which is equivalent to nearly £250,000 over 30 years.



A Large Hotel with 120 rooms can reduce its carbon emissions by 61.8 tonnes of carbon emissions and cut energy bills by over £25,000 per year and up to £750,000 over the next 30 years.



A Craft Brewery producing 1.5m litres per year can save 43.4 tonnes of carbon emissions every year and over £12,200 on energy bills – that's a saving of up to £366,000 over the next 30 years.

Residential Savings

(Energy costs as at June 2022)

These calculations used an energy-auditing tool to quantify likely energy consumption by a range of UK domestic buildings first without and then with hard-water treatment installed; then from these and the likely associated water-consumption figures calculated consequent total emissions of greenhouse gases (quantified as carbon dioxide equivalent, CO₂e, popularly referred to simply as “carbon”).

Likely levels of consumption were based on standard, quoted mean figures, adjusted according to age of building in order to allow for changes to thermal efficiency of building fabric and energy efficiency of fitted equipment such as gas boilers.

Carbon calculations were made according to the Greenhouse Gas Protocol, using the UK government’s annually-published carbon conversion factors; and they incorporated all scope 1 – 3 emissions related directly to the buildings’ physical fabric and fittings.

FACT

14% of the energy consumption in EU homes is for the production of hot water

The average UK home can save 14% on their annual CO₂e consumption which equals 0.6 tonnes CO₂e every year, year on year (a reduction from 4.2 to 3.6 CO₂e tonnes pa). Equivalent to 1824 kWh per annum

**Pre 1950's House
(Couple)**

	Savings Per Year	Savings Over 30 Years
Carbon Saving Co2e	0.6 tonnes	18 tonnes
Solid Fuel	£43	£1,290
Electricity	£1,164	£34,920
kWh Usage	3,385	101,550
Total Saving	£1,207	£36,210

**New Build House
(Couple)**

	Savings Per Year	Savings Over 30 Years
Carbon Saving Co2e	0.7 tonnes	21 tonnes
Gas	£103	£3,090
Electricity	£345	£10,350
kWh Usage	1,867	56,010
Total Saving	£449	£13,440

Pre 1950's House (Family)

	Savings Per Year	Savings Over 30 Years
Carbon Saving CO2e	0.5 tonnes	15 tonnes
Gas	£106	£3,180
Electricity	£205	£6,150
kWh Usage	1,445	43,350
Total Saving	£311	£9,330

New Build House (Family)

	Savings Per Year	Savings Over 30 Years
Carbon Saving CO2e	0.7 tonnes	21 tonnes
Solid Fuel	£136	£4,080
Electricity	£332	£9,960
kWh Usage	2,034	61,020
Total Saving	£469	£14,040

Average Home

	Savings Per Year	Savings Over 30 Years
Carbon Saving CO2e	0.6 tonnes	18 tonnes
Gas	£143	£4,290
Electricity	£188	£5,640
kWh Usage	1,824	54,720
Total Saving	£332	£9,930

Commercial Savings

(Energy costs as at June 2022)

These calculations used an energy-auditing tool to break down how energy is consumed at three types of UK business, first without and then with hard-water treatment installed. From these figures we could quantify the effect on emissions of greenhouse gases (quantified as carbon dioxide equivalent, CO₂e, popularly referred to simply as “carbon”).

We looked at a “typical” example of:

A commercial office with 105 staff.

A large hotel with 120 rooms.

A craft brewery, producing 1.5m litres per year.

The levels of consumption at each were based upon figures from actual energy audits conducted at a real, similar business.

Carbon emissions were calculated according to the Greenhouse Gas Protocol, using the UK government’s annually-published carbon conversion factors; and they incorporated all scope 1 – 3 emissions related directly to the buildings’ physical fabric and fittings.

Sustainable Development Goals



Commercial Offices (105 Staff)

	Without Hard Water Treatment	With Hard Water Treatment	Annual Saving
Carbon Saving CO2e (tonnes)	428	412	15
Gas (kWh)	464,336	430,633	£767
Electricity (kWh)	943,183	930,724	£7,466
Total Annual (kWh)	1,451,051	1,389,141	61,910
Total Saving			£8,234

Large Hotel (120 Rooms)

	Without Hard Water Treatment	With Hard Water Treatment	Annual Saving
Carbon Saving CO ₂ e (tonnes)	1000	939	61
Gas (kWh)	2,103,471	1,893,236	£5,349
Electricity (kWh)	1,644,531	1,607,464	£20,440
Total Annual (kWh)	3,824,493	3,572,144	252,349
Total Saving			£25,790

Craft Brewery (Producing 1.5m litres per year)

	Without Hard Water Treatment	With Hard Water Treatment	Annual Saving
Carbon Saving CO2e (tonnes)	311	268	43
Gas (kWh)	975,416	807,783	£5,678
Electricity (kWh)	218,185	207,403	£6,561
Total Annual (kWh)	1,283,443	1,091,599	191,844
Total Saving			£12,239

Other Savings

Effective and sustainable water treatment not only reduces limescale within systems but it also produces 'softer' water which makes soaps, detergents and cleaning products much more effective, so significantly less is consumed by households or cleaning teams. This results in substantial savings on consumables, fewer chemicals entering the watercourse and a considerable reduction in the amount of single-use plastics used.

Over the longer term, water-bearing appliances require less maintenance and last for up to twice as long, including washing machines, dishwashers and boilers. Our research shows that this can save a householder up to £2,700 over 30 years, depending on business type these savings are substantially larger for commercial properties.

Other Benefits of Treating Hard Water Sustainably.

As well as removing the existing limescale in systems and preventing future build-up, owners and tenants will experience many other benefits, including;

Improved equipment efficiency and reliability.

Reduced operating and maintenance costs
- plus improved customer satisfaction.

Protected asset values.

Maintained design efficiencies particularly in
hot water generation systems, long term.

Reduced risk of Legionella.





Living with Limescale

There are several ways to deal with limescale build-up, for example chemical de-scaling of taps and showerheads, but the real problem is inside the systems especially the heating elements in hot water generating appliances. While chemical treatments can remove limescale build-up inside some appliances and fixtures it isn't appropriate for many systems and requires high levels of maintenance.

Avoiding the need for post accumulation treatment is highly preferable and much more cost effective. There are various choices available in the market to treat hard water but with sustainability the key priority on most agenda's, many of these methods cannot deliver an effective and sustainable long-term solution.

**If you need more information,
please contact us.**

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Data from this report may only be reproduced if referenced as follows:

Source: Halcyan Ltd proprietary research on the effects of hard water on energy efficiency / carbon emissions / energy bills from UK domestic buildings / UK business premises