



BNCK06: Kettle trends

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1.0 Introduction

This briefing note aims to:

1. Outline the recent history of kettles
2. Summarise the different types available and their energy use implications
3. Summarise options for the future

2.0 Summary

It is estimated that 97% of UK households own a kettle, and kettles consume approximately 4.2 tWh of electricity per year. Over the past 5 years kettles have altered due to changing kitchen fashions and the introduction of new features[1]. Assuming that user habits have not changed, then kettles currently entering the market are more likely to use more energy than the previous generation. The new features and design changes may directly or indirectly lead to greater energy use.

This briefing note discusses the effect in terms of energy use of an increase in market share of such kettles, and what possibilities there are to reverse the trend for kettles with greater energy consumption. It also discusses a product already on the market that, when the instructions are followed, reduce energy consumption by an average of 30% by restricting water use in the kettle.

3.0 Kettle developments

The kettle is a rapidly changing small domestic appliance that sets and reacts to design trends. It is estimated that 7 million kettles will be sold in the UK during 2005. Their estimated lifespan is 4 to 5 years[2]. Many recent design trends and new innovations may mean that kettles are using more energy than their predecessors. It is estimated that 97% of UK households own a kettle, and kettles consume approximately 4.2 tWh of electricity per year. This is approximately 27% of all electricity used in domestic cooking[3].

3.1 Volume and minimum capacity

Kettles have changed to hold larger volumes of water, with many kettles now holding 1.7 litres of water or more[4] and some holding close to 2 litres. Larger kettle capacities may mean that users habitually over-fill them by a greater amount of water, and so increase energy use.

As well as an increase in total kettle capacity, trends for wider based traditional style kettles mean that average minimum capacities required to cover the element have increased[5]. Consequently, even if people attempt to restrict water use, they may still be using more water than they need because some kettles cannot boil a minimum of 0.25 litres (1 cup).

3.2 Power Rating

Kettles have also become more powerful, 3kW rapid boil kettles were rare in 1997, when ratings were typically 2.2kW, but very common in 2005[6]. Power has been increased to give faster boil times. But this may mean that consumers are less concerned about over-filling the kettle, as the water does not take long to boil.

3.3 Water level indicators

Most kettles now have dual water level indicators[7], features that were rare in 1997. Having a water level indicator to judge the water more accurately has been seen as a key way to encourage people to boil only the water they need, however poor positioning and labelling of water level indicators often means that consumers find it difficult to accurately measure the water and so may not use the indicators at all.

3.4 Cordless kettles

The number of cordless kettles has also increased so that the majority of new kettles now have a base on which they are located[8]. Ownership of cordless kettles was estimated at 68% in 2004[9]. The base on which kettles are located is now being utilised to introduce additional features that may lead to increased energy use, these include:

- Water filter kettles that have an electronic reminder display to indicate to the user when the filter needs changing[10]
- A keep warm facility to keep hot water on standby
- Illumination of kettles has changed from simple on lights to indicate the kettle is boiling, to flashing LEDs in the base, standby illumination, internal illumination during boiling, and three-colour illumination to indicate different stages of boiling[11]
- Kettles with a whistle function on boil
- Kettles with temperature selectors.

Many of the kettles with additional features also have standby functions meaning that a light, or display is on even when the kettle is not in use, a function that will also increase energy use. An initial investigation of a keep warm function suggests that 66 W are used to keep a half-full kettle warm, and 1.5 W during standby when the kettle is off.

3.5 Eco Kettle

A kettle that was designed to reduce energy use, the Eco Kettle, was introduced onto the market in 2004. The Eco Kettle is designed to hold 1.5 litres of water ready to use, but with the press of a button the user can choose exactly how much water to boil, from a minimum of 1 cup to a maximum of 8[12]. Recent independent tests on the Eco Kettle showed that, on average, consumers could save 30 % of energy when compared to their normal kettle and habits if they followed the instructions for the kettle.

4.0 Energy use scenarios

Cooking appliances account for approximately 23 tWh of energy consumption in the UK in 2005. Of this, kettles use approximately 4.22 tWh. There is potential for both saving and increases in energy used by kettles.

4.1 Best and worst case

It is not known how extensively consumers use the keep warm facility but a scenario has been calculated as a worst case that demonstrates the potential wastage of keep warm kettles as opposed to the best case of reduced use with an eco kettle for the whole stock of kettles. The standard and eco kettle figures are based on 1542 uses per year, the keep warm kettle on 70% of that figure. Compared to the reference scenario, if the best-case scenario was achieved in 2005, 1.27 tWh of energy could be saved, which equates to a total saving of 0.14 MtC. If in 2005, the worst-case scenario was realised 1.96 tWh of energy would be added, a figure that equates to 0.22 MtC added (Table 1).

	Energy use per kettle per year (kWh) [13]	Total energy use per year of all kettles (TWh)	Energy saved/added per year (TWh)	Total Carbon consumption per year (MtC)	Carbon saved/added per year (MtC)
Standard kettle	169.6	4.22	-	0.46	-
Eco kettle	118.72	2.96	1.27 saved	0.33	0.14 saved
Keep warm kettle [14]	248.26	6.18	1.96 added	0.68	0.22 added

Table 1 - Energy use and carbon consumption comparison of normal, keep warm, and eco kettles [15]

4.2 Effect of reduced temperature kettles

Kettles with temperature selectors could also be used to reduce energy and carbon consumption by selecting the recommended temperatures for coffee (approx 95°C) and speciality teas (80°C) [16]. Assuming that all kettle use is for hot drinks, and that 33 % of times the kettle is boiled is for coffee and 66 % for tea, of which 7 % are speciality teas [17], then a total of 0.22 tWh of energy and 0.02 MtC could be saved each year just by heating the water to the recommended temperature for each drink (Table 2). These figures could be proportioned differently if evidence is produced for the actual percentage of kettle energy that is used for hot drinks.

	Energy used per kettle (kWh)	Total stock (tWh)	Carbon (MtC)
Tea (100°C) 59% of all uses	104.10	2.59	0.29
Speciality tea (80°C) 7% of all uses	5.60	0.14	0.02
Coffee (95°C) 33% of all uses	51.09	1.27	0.14
Total	160.79	4.00	0.44

Table 2 - Energy use and carbon consumption comparison of reducing water temperatures for different drinks [18]

5.0 Options for the future

- Encourage users to boil only the amount of water necessary and demonstrate possible savings. RISK: Consumer habits may be difficult to change.
- Encourage the take up of reduced temperature kettles, especially by speciality tea drinkers. RISK: consumers may reject idea of non-boiled water.
- Create a kettle mark that indicates to consumers that the kettle can boil a set minimum amount of water, e.g. 1 cup (250ml). RISK: Manufacturers may be reluctant to accept such a scheme as it may add additional costs on implementation.
- Promote the eco kettle or similar products. RISK: Eco kettle mid to high priced at £40, and not available in many high street retailers.

- Introduce energy efficiency scheme for kettles and other small kitchen appliances to raise awareness of energy use. RISK: Cost of introducing such a scheme, possible reluctance of manufacturers and retailers, lack of consumer knowledge about what the labels actually mean once introduced.
- If keep warm is a function that consumers really want, then encourage the design of more energy efficient keep warm kettles that do not increase energy consumption above standard kettles. RISK: Energy efficient keep warm technology may be difficult and expensive to produce and the extra cost may be passed onto the consumer.
- Extend the average lifespan of a kettle by improved design and reducing the consumers need to buy a kettle to match their décor by making kettles that will suit all kitchens rather than following fads and trends. RISK: Kitchen fashions are still changing regularly and manufacturers are responding by producing more and more 'fashionable' kettles.

With feedback, questions or comments please contact info@mtprog.com or call the MTP enquiry line on +44(0)845 600 8951, quoting document reference BNCK06.

[1] 86 % of cordless kettle purchasers choose their kettle to match their kitchen décor. BRMB/ Mintel, November 2004 survey of 1024 adults aged 15+

[2] GfK figures support the idea that kettles are replaced at intervals of around 5 years

[3] See BNCK01 <http://www.mtprog.com/ApprovedBriefingNotes/BriefingNoteTemplate.aspx?intBriefingNoteID=204> and WhatIf figures <http://www.mtprog.com/WhatIf.aspx>

[4] 65 % of kettles on sale in Argos Autumn/Winter 2005 catalogue have a capacity of 1.7 litres or more

[5] Published Which? reports and Intertek test data shows that average minimum capacities have increased from 325ml to 376ml between 1997 and 2005

[6] 73 % of kettles on sale in Argos Autumn/Winter 2005 catalogue, and 62 % in Which? December 2004 (pg 50) have a power rating of 3kW or more

[7] GfK figures show that most plastic kettles sold in 2002 had a water level indicator. 79 % of kettles on sale in Argos Autumn/Winter 2005 catalogue have a water level indicator

[8] 99 % of kettles on sale in Argos Autumn/Winter 2005 catalogue are cordless

[9] BRMB/ Mintel, survey of 978 adults aged 15+ in 2003 and 1024 in 2004

[10] Water filter kettles were owned by 13 % of people in a BRMB/ Mintel, survey of 1024 adults aged 15+ in 2004

[11] In the Argos Autumn/Winter 2005 catalogue 23 % of kettles on sale have some form of illumination other than an on light, and keep warm is a facility on 9 %

[12] www.Ecokettle.com Accessed 24/08/05

[13] BNCK01 and Intertek RPT calculations based on heating 1 litre of water

[14] Based on a cycle of boiling a full kettle, emptying half, and keeping warm for 40 minutes once per day (Table 1)

[15] Calculated using BNCK01 and Intertek RPT calculations based on heating 1 litre of water, and figures from the ODPM

[16] http://www.tefal.co.uk/tefal/magazine/hottopics/vit_s/index.asp Accessed 28/09/05

[17] Tea outsells coffee by 2 to 1, http://www.teahealth.co.uk/tea_news_latest01.html?id=39 Accessed 29/09/05.

[18] Intertek RPT figures, August/September 2005