



BNDH EWH03: Domestic Gas Water Heaters Government Standards Evidence Base 2009: Policy Scenario

Version 1.0

This Briefing Note and referenced information is a public consultation document and will be used to inform Government decisions. The information and analysis forms part of the Evidence Base created by Defra's Market Transformation Programme.

1 Introduction

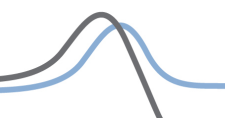
- The Policy Scenario is a projection of what would happen if a defined set of new product-specific and related cross-cutting policies were implemented. The policies in the Policy Scenario have not yet been agreed or funded but represent those policies which are expected to be introduced as well as likely future revisions to existing policies and, in some cases, novel policy options. These policies aim to improve the average efficiency of products in the stock through a variety of mechanisms (e.g. minimum standards, product information and labelling, procurement, incentives) and thus reduce energy consumption and carbon emissions resulting from to these products.
- As product policy is considered within the context of climate change policy, the UK government considers policies with a net UK costs of up to around £20 per tonne of CO₂ saved (compared to the Reference Scenario). The ambition level, at a minimum, matches the Least Life Cycle Cost (LLCC) level to society of increased energy efficiency of products.

1.1 Product definition

- Products covered by this briefing note are **Dedicated Domestic Electric Water Heaters**, which are defined in the ErP¹ Working Document on possible Eco-design Energy labelling and Installation requirements for Water Heaters² as a “**product that**

¹ The Energy related Products Directive, in this paper referring to the documents for Lot 2, Water heaters.

² July 2008 revision, page 5.



is connected to a given external supply of drinking water and is equipped to generate heat and transfer this drinking water to desired temperature levels and at desired quantities, flow rates and intervals.”

- Dedicated domestic water heaters can be distinguished by fuel (gas, electricity, solar, etc.) and functionality (storage and instantaneous). This briefing note covers instantaneous and storage electric water heaters and includes:
 1. Electric storage (kitchen heaters or small showers) water heaters [ES]
 2. Electric instantaneous water heaters and electric boiling water appliances (electronic) [EI]
 3. Electric showers (instantaneous hydraulic) [EIH].
- This brief does not include combination units for space and water heating, which are covered by the Domestic Boilers model described in BNDH B01: Domestic Boilers Government Standards Evidence Base 2009: Key Inputs.

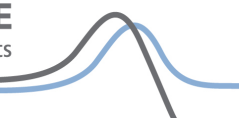
1.1.1 Dedicated Domestic Electric Storage [ES] Water Heaters

- The **Dedicated Domestic Electric Storage [ES] Water Heaters** that have been modelled can be classified as follow:
 - Single point/non-pressurised with a capacity of less than 15 litres
 - Multi point/pressurised with a capacity of less than 15 litres
 - Large vented with a capacity bigger than 15 litres.
- **Single point/non-pressurised:** these are also named “displacement” or “point of use” water heaters (e.g. hand wash appliances) and have an open outlet. To displace the hot water they rely on the opening of a tap or a valve on the inlet side in the heater with incoming cold water. The open outlet ensures that any excess pressure in the heater is vented.³
- **Multi point/pressurised:** these are supplied directly from the mains under pressure and can deliver hot water to two or more outlets simultaneously.
- **Large vented:** these have a storage capacity that is above 15 litres and are mainly applied to supply multiple consumer points where supply from a cold-water storage tank is impractical.⁴ A vent pipe allows a safe route for excess pressure, air bubbles and steam should the system overheat; it runs from the top of the cylinder back up to the cold-water storage header tank where its open vent is located just above the water level.⁵

³ BSRIA, March 2008, World heating 2007 – United Kingdom Water Heating – Report 50851/17

⁴ BSRIA, March 2008, World heating 2007 – United Kingdom Water Heating – Report 50851/17

⁵ <http://www.plumbingpages.com/featurepages/HWopenvented.cfm>



1.1.2 Dedicated Domestic Electric Instantaneous Water Heaters

- The instantaneous types of Dedicated Domestic Electric Water heaters are mainly used as point-of-use water heaters and are characterised by a number of elements: flow rate at a particular outlet temperature, flow rate control and water heater pressure.
- For the purpose of this study the **Dedicated Domestic Electric Instantaneous Water Heaters** have been split into groups:
 - Instantaneous water heating devices with “electronic” flow rate control **[EI]**, including non-pressurised single point ‘hand-wash’ units and pressurised in-line units (12 kW or less) which deliver heated water to multiple taps or showers. These products can maintain a set temperature throughout a range of flow rates and sometimes allow the user to preset temperature and/or flow rate through the electronic control. This group also includes instantaneous electric boiling water appliances⁶ which are water heaters designed to produce water up to the boiling point. For example these are used to supply hot water for consumption: tea, soup, etc.
 - Instantaneous water heating devices with “hydraulic” flow rate control **[EIH]**. This product type includes mainly electric showers and is controlled by a simple heating on/off switch dependant on the water pressure, but with a temperature limit override. Electric showers are fed with cold water only, which is heated instantaneously as the water flows. Flow rates are relatively low at about 4-9 litres per minute, depending on power rating and required temperature rise. These rates can also be affected by low mains pressure at peak times, diminishing performance. Electric showers typically use about 300 kWh per household per year. Running costs and associated CO₂ emissions of electric showers are much higher than mixer showers using water heated by gas.⁷

⁶ ErP Preparatory Study on Eco-design of Water Heaters – Task 4 Report Final, VHK, September 2007, p.145 <http://www.ecohotwater.org/>

⁷ Domestic heating and hot water – choice of fuel and system type - Good Practice Guide - GPG 301, Building Research Energy Conservation Support Unit, 2002



Figure 1 Example of a typical Electric Instantaneous Water Heater (Vaillant) and Electric Shower⁸

⁸ www.plumword.co.uk



2 Scenario outputs

2.1 Summary

- The Energy related Product Directive 2005/32/EC (ErP) is the main policy for dedicated domestic water heaters, this is the only policy that will have direct impact on the efficiency of dedicated domestic electric water heaters.
- The graph below shows the impact of the ErP in term of total energy consumption of dedicated domestic electric water heaters.

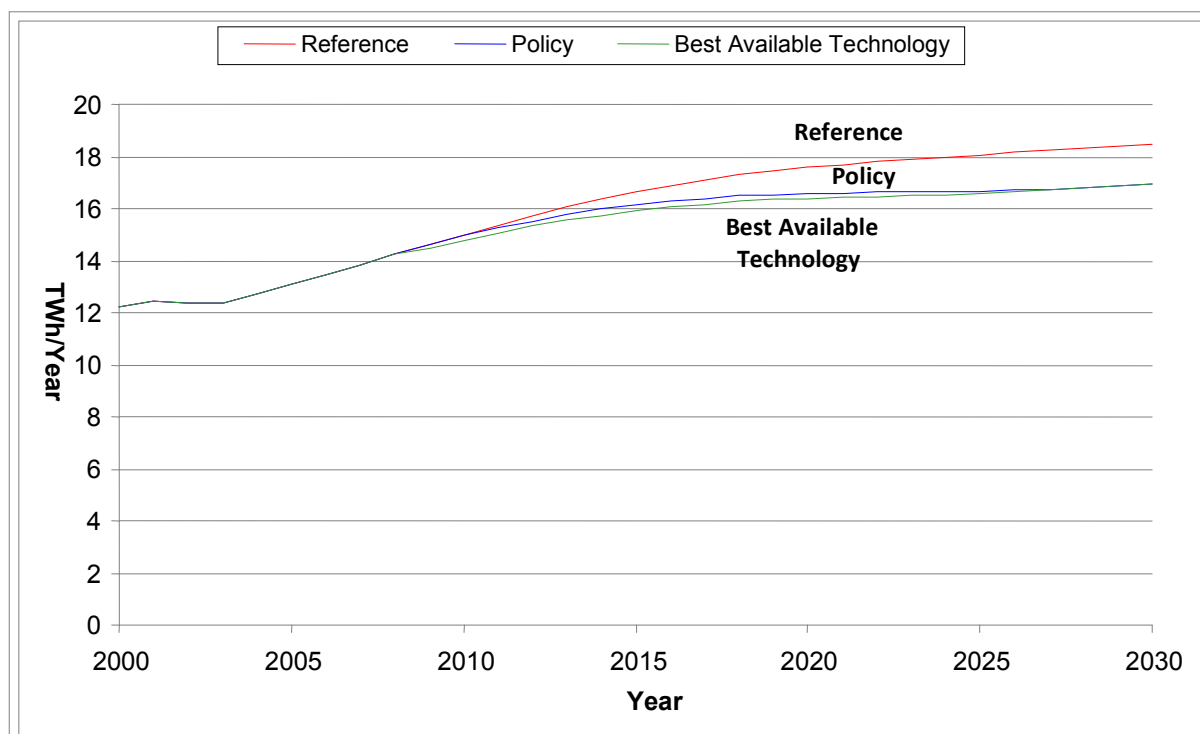


Figure 2 Dedicated Domestic Water Heaters (Electric) - Energy Consumption

Table 1 – Summary energy consumption and savings – Electric Storage (ES)

Policy Scenario year	Total energy consumption (Policy, GWh)	Annual energy savings (Reference - Policy, GWh)	Annual CO ₂ Savings (Reference - Policy, MtCO ₂)
2010	2,570	-	-
2020	2,180	513	0.22
2030	2,000	789	0.34

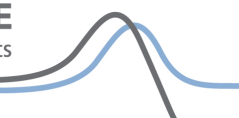


Table 2 – Summary energy consumption and savings – Electric Instantaneous (EI)

Policy Scenario year	Total energy consumption (Policy, GWh)	Annual energy savings (Reference - Policy, GWh)	Annual CO ₂ Savings (Reference - Policy, MtCO ₂)
2010	1,070	-	-
2020	1,250	-65	-0.03
2030	1,330	-95	-0.04

- Technology switching: note that savings for EI in the policy scenario appear negative. This is because sales of EI products are greater in the Policy Scenario compared to the reference – therefore overall energy consumption is higher and savings appear negative. Sales of EI products are expected to rise as sales of ES products fall, due to ErP: the best efficiency achievable by Electric Storage water heaters (sizes XS and XXS) is 27%. The efficiency required by the ErP for these products is 32% from 2011. It is assumed that the more efficient, instantaneous products replace all Electric Storage products unable to achieve this 32%.

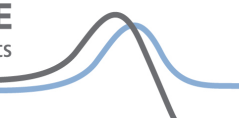
Table 3 – Summary energy consumption and savings – Electric Instantaneous Showers (EIH)

Policy Scenario year	Total energy consumption (Policy, GWh)	Annual energy savings (Reference - Policy, GWh)	Annual CO ₂ Savings (Reference - Policy, MtCO ₂)
2010	11,300	-	-
2020	13,100	560	0.24
2030	13,600	829	0.36

Table 4 Summary cost and benefit⁹ data

	Average annual energy savings (£m)	Average annual product & policy cost increases 2030 (£m)	Net Benefit (2009 – 2030) (£m)	Cost Effectiveness Traded (£/tCO ₂)	Cost Effectiveness Non-traded (£/tCO ₂)
All water heaters	83.5	83.4	1.1	25.2	N/A

⁹ Refer to BNXS26 Rationale for Policy Cost Estimates used in MTP Policy Briefs for details on factors used.



3 Current policy & measures – Policy Scenario

3.1 Brief description of policies & measures

3.1.1 ErP and Labelling

- The main policy which impacts on water heaters is the Energy related Products Directive 2005/32/EC (ERP).
- Currently, the “*Working Document on possible Ecodesign Energy Labelling and Installation requirements for Water Heaters*”¹⁰ defines the proposed requirements related to: energy labelling, installation and harmonised rating of water heaters.
- The latter are related to the ‘specific efficiency’ of water heaters and the requirements are presented in Table 5 below.
- Installation requirements set out are illustrative, and would need to be introduced through the revision to the Energy Performance of Buildings Directive (EPBD).
- The specific energy efficiency is described in Annex IV¹¹ of the working document for a specific load profile and is defined as the ratio of the minimum theoretical energy consumption to generate the required energy load to the actual primary energy consumption. The latter includes the impact of smart control and adjustments for the distribution losses within the building.

Table 5 Minimum requirements for the ‘specific efficiency’ % of water heaters (%)¹²

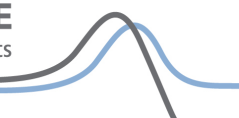
Size	XXS	XS	S	M	L	XL
<i>From 1 Jan</i>						
2011	32	32	32	36	37	40
2013*				38*	45*	50*
2015**	34	34	41	55	60	72

*The 2013 limits shall not apply to resistance electric water heaters of size classes M, L and XL. However, any product covered by this exception shall carry the warning: 'NB To install this product you will require prior authorisation.'

¹⁰ http://www.ebpg.bam.de/de/ebpg_medien/002_workd_08-07_version3.pdf

¹¹ Annex IV on Eco-design implementing measures for dedicated water heaters Draft v2 - European Commission - Brussels, (June 2008)

¹² Working document on possible Ecodesign Energy labelling and Installation requirements for Water heaters – http://www.ebpg.bam.de/de/ebpg_medien/002_workd_08-07_version3.pdf



** Products failing to meet the 2015 limits may (provisionally) continue to be sold, but must carry the same warning as above. This is without prejudice to the outcome of the updating of Ecodesign implementing measures for these products.

- At the time of modelling, the labelling requirements were expected to become compulsory by January 2009. The rating scale for energy labelling is presented in the table below¹³. Energy labelling shall apply to sizes that range from XXS to XL.
- The number in bold in Table 6 are the minimum requirements efficiency for the 'specific efficiency' % of water heaters for 2011 (black), 2013 (blue) and 2015 (red).

Table 6 Labelling/rating thresholds for water heaters.

From 1Jan 2009	From 1Jan 2012	From 1Jan 2014	XXS	XS	S	M	L	XL
[TBA]*	[TBA]*	A	52	62	72	86	98	112
[TBA]*	[TBA]*	B	46	53	63	74	85	96
[TBA]*	A	C	41	46	56	64	70	82
[TBA]*	B	D	36	39	49	55	60	72
A	C	E	32	34	44	48	50	66
B	D	F	29	32	38	41	45	50
C	E		25	29	34	38	41	45
D	F		22	26	32	36	37	40
E			19	23	26	30	33	35
F			17	20	23	26	30	30

*The way of indicating labels higher than A has yet to be confirmed.

- The installation requirements are consistent with Energy labelling and Ecodesign thresholds.

¹³ Working document on possible Ecodesign Energy labelling and Installation requirements for Water Heaters

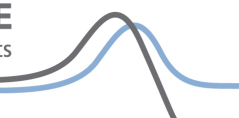


Table 7 Current policies & measures, Policy Scenario

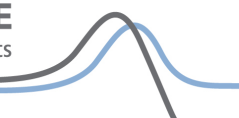
Policy name	Period in force	Description	Impact	Cost ¹⁴	Justification
ErP	2011-2013	Minimum specific efficiency levels are required for all sizes. There is also an effect due to the raising of standards to achieve any grade of label	87% of the market (mainly electric showers) affected. 68% of the Electric Storage market might be affected by the label changes, especially XS and S size products.	Cost premium approximately 36%, compared to Reference Scenario	In process of being adopted at the European level, with an anticipated requirement to adopt in the UK by 2011
ErP	2013-2015	Minimum specific efficiency levels are required for sizes from M to XL. The requirements to achieve, for example a 'A' rating will also be tightened	No relevant changes from 2011 requirements. 51% of market might be affected by the label changes	Cost premium of purchasing an electric water heater complying with ErP requirements compared to Reference Scenario is about 36%	In process of being adopted at the European level, with an anticipated requirement to adopt in the UK by 2011
ErP	2015 -?	Minimum specific efficiency levels are set for sizes from XS to XL.	Another 30% of the electric dedicated water heaters market might be affected. Authorization and warning on the product is required.	Cost premium of purchasing an electric water heater complying with ErP requirements is more than 69%.	In process of being adopted at the European level, with an anticipated requirement to adopt in the UK by 2011

3.2 Policy timeline

- The following policy timeline indicates when policies come into effect, including future revisions

Policy name	Current specification in force	2009	2010	2011	2012	2013	2014	2015	2016-2030
ErP	no			estimate		estimate		estimate	

¹⁴ All additional cost are calculated over Base Case cost [2007]



4 Efficiency

4.1 Summary

- The efficiency improvements expected under the Policy Scenario are related to the water heater specific efficiency (or system efficiency). Dedicated domestic electric water heaters will be required to meet higher specific efficiency levels by 2011, 2013 and 2015.

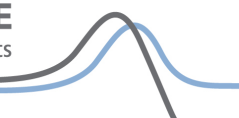
The characteristics of these more efficient products/systems are:

- ES:
 - Improved heat loss
 - Improved electronic temperature sensors and control, varying temperature according to hot water demand
- EI:
 - Improved electronic control: conventional on-off heating elements depend on a minimum flow rate, and below a certain pressure the device does not activate these elements. Electronic control manages flow rate and temperature more efficiently.
 - Two-stage power control (summer/winter switch) accommodates the drop in incoming water temperature that occurs during winter times.
- EIH: electronic control
 - Control that maintains a set temperature throughout a certain range in flow rate and allows temperatures and flow rate to be pre-set.
 - Advanced electronic models offer preset buttons for specific temperatures
- The specific efficiency is described in Annex IV¹⁵ for a particular load profile:

The primary efficiency is distinguished from the specific efficiency of a product. The latter¹⁶, for a specific load profile, is defined as the ratio of the minimum theoretical energy consumption to generate the required energy load to the actual primary energy consumption. The consumption calculation includes the impact of smart control correction and adjustments for the distribution losses within the building.
- A calculation model, the “Ecohotwater model”, which calculates the efficiency and energy consumption of Domestic Dedicated Electric Water Heaters, supports Annex IV.

¹⁵ ErP Working Document, ANNEX IV on Eco-design implementing measures for dedicated water heaters Draft v2 - European Commission - Brussels, (June 2008)

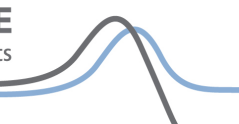
¹⁶ ErP Working Document, Annex IV on Eco-design implementing measures for dedicated water heaters Draft v2 - European Commission - Brussels, (June 2008)



- Three dedicated domestic electric water heater types are modelled to reflect Policy Scenario, classified according to Task 6 of the ErP Preparatory Study on Ecodesign of Water Heaters. These are:
 - Electric Storage (ES)
 - Electric Instantaneous (with electric flow rate controls - EI) and;
 - Electric Instantaneous (with hydraulic flow rate controls e.g. electric showers - EIH).
- In the Ecohotwater model water heaters are subdivided in size classes (based on kW output) from 3XS (the smallest size) to 4XXL (the biggest size). For the purpose of this study, which focuses only on domestic electric water heaters, the relevant classes have been reduced to six for ES water heaters (from XXS to XL), to three for EI (from XS to M) and two for EIH (XS and XS).
- For further details of the Ecohotwater model, see BNDH EW02: Domestic Electric Water Heaters, Reference Scenario; Section 4.1
- In the chart below, specific efficiency (%) for each size category of each product type has been multiplied by the corresponding sales, weighted by average usage, to display efficiency improvement in terms of average demand (kWh) per annum, for each product type.



Figure 3 Sales-weighted average efficiency by product type



4.2 Data sources – efficiency

Table 8 Efficiency data sources

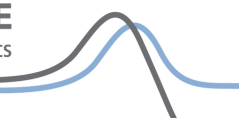
Year	Reference	Reference date	Author	Justification	Confidence in sources (High/Low)
2006	Ecohotwater/Preparatory Study on Water Heaters-Task 5 Report –(final) Definition of Base Case	30 Sept 2007	Rene' Kemna, Martijn van Elburg, William Li, Rob van Holsteijn	EU proposed method for energy efficiency calculation	High

4.3 Methodology & key assumptions – efficiency

- A number of reference options have been defined for each of the dedicated domestic electric water heaters (ES, EI and EIH) currently sold in the UK, in order to model the whole UK market for these products.
- A single product has been selected to represent each size (from XS to XL) and type (ES, EI or EIH).
- The parameter chosen for each of the reference design options were input to the Ecohotwater model, which calculates the energy efficiency and total energy consumption for every product under the Policy Scenario
- From 1986 to 2012 the efficiency and energy consumption calculated for each size range has been averaged for every year and weighted by product sales.
- Table 9 shows in the red cells the specific efficiency required by ErP for dedicated domestic storage electric water heaters for 2012, 2013 and 2015.

Table 9 Efficiency and energy consumption (ES) - [Impact of ErP 2011-2013-2015]

ELECTRIC STORAGE WATER HEATERS (ES)		XXS	XS	S	M	L	XL
Typical storage size (litres)		5-10	10-15	15-30	80	120	150
% of sales		29.8	63.1	4.6	0.8	0.7	1.0
Reference	Energy Consumption (kWh)	1,777	1,777	2,174	4,669	9,478	14,320
Reference	Specific Efficiency (%)	25	25	22	27	27	29
2011	Specific Efficiency (%)	32	32	32	27	27	29
2013	Specific Efficiency (%)	32	32	32	27	27	29
2015	Specific Efficiency (%)	32	34	34	27	27	29



- Small storage water heaters may struggle to achieve the efficiency required by ErP. It is possible that electric storage products could be substituted by instantaneous electric water heaters that perform better. For products that cannot meet the efficiency requirement there is also the possibility to apply a warning label (see text below Table 5).
- Table 10 and
- Table 11 show in the red cells the specific efficiency required by ErP for dedicated domestic instantaneous electric water heaters for 2012, 2013 and 2015.

Table 10 Efficiency and energy consumption (EI) [Impact of ErP 2011-2013-2015]

ELECTRIC WATER HEATERS (EI)		XXS	XS	S	M
Min power ¹⁷ (kW)		6.3	12.5	15.7	18.8/23.3
	% of sales	90	3.7	3.8	2.5
	Energy Consumption (kWh)	1,348	1,369	1,350	3,400
Reference	Specific Efficiency (%)	34	34	34	38
2011	Specific Efficiency (%)	34	34	34	38
2013	Specific Efficiency (%)	34	34	34	38
2015	Specific Efficiency (%)	34	34	34	41

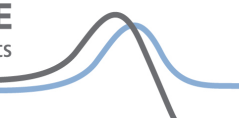
Table 11 Efficiency and energy consumption (EIH) [Impact of ErP 2011-2013-2015]

ELECTRIC INSTANTANEOUS WATER HEATERS (EIH)		XXS	XS
Min power (kW)		6.3	12.5
	% of sales	90	10
	Energy Consumption (kWh)	1,513	1,348
Reference	Specific Efficiency (%)	30	34
2011	Specific Efficiency (%)	32	34
2013	Specific Efficiency (%)	32	34
2015	Specific Efficiency (%)	32	34

4.3.1 Historic data

- For historic data see BNDH EW02: Domestic Electric Water Heaters, Reference Scenario; Section 4

¹⁷ Quoted in the ErP Working Document on possible Ecodesign Energy labelling and Installation requirements for Water Heaters (July 2008): Minimum power of 100/80% efficiency at steady state.



4.3.2 Future analysis

Table 12 Extrapolation & background calculations – efficiency

Year	Methodology & assumptions
2008-2030	The same methodology applied to calculate the sales-weighted annual average efficiency for 2006 has been applied to the following years to 2030. The recommended ErP efficiency values have been applied for year 2011, 2013 and 2015 to all products affected by this policy.

4.4 Data issues – efficiency

- Ecohotwater is a complex tool and it is still in draft format. The regulations are also at present in draft form¹⁸.

Table 13 Data issues – efficiency

Issue/risk	Approach taken/rationale
Efficiency data from Ecohotwater and Preparatory Study on Ecodesign of water Heaters.	Calculation to be updated when possible, with future revision of the regulations and the Ecohotwater model.

4.5 Confidence level – efficiency

- Confidence level is low due to scarcity of information about the efficiency of water heaters by size [kW], for the time line (1986-2030). Calculation of efficiency is based on a single product for each category.

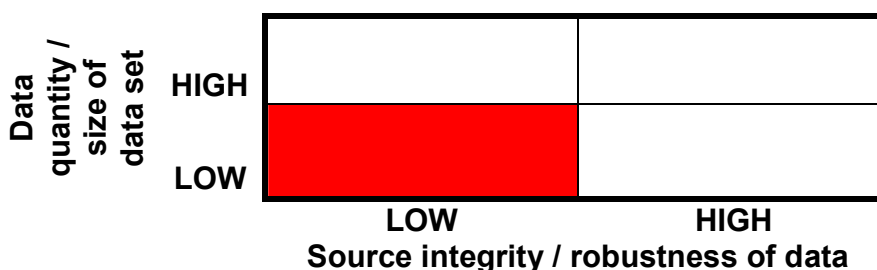
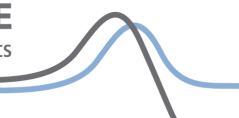


Figure 4 Confidence indicator for efficiency data

¹⁸ Working document on possible Ecodesign Energy labelling and Installation requirements for Dedicated Water Heaters (June 2008)



5 Cost

5.1 Summary

- The costs presented in this section comprise product purchase price and installation cost. Product prices are based upon the prices identified in Tasks 2 and 4 of the Preparatory Study on Eco-design of Water Heaters¹⁹, which are EU-wide averages.

5.2 Data sources – cost

Table 14 Cost data sources

Year	Reference	Reference date	Author	Justification	Confidence in sources (High/Low)
2007	Preparatory Study on Water Heaters-Task 6 Design Options – (final),	30 Sept 2007	Rene' Kemna, Martijn van Elburg, William Li, Rob van Holsteijn	Best available data	High

- The additional cost of the policy has been estimated against the cost of the Reference Scenario that is listed for each water heater size in Table 15,
- Table 16 and Table 17 and the price weighted by the percentage of sales for each ErP category.

Table 15 Reference case product prices for each ErP size (ES)

WATER HEATERS	XXS	XS	S	M	L	XL	Reference Scenario
Electric storage [ES]							Sales-Weighted Average
Typical storage size (litres)	5-10	10-15	15-30	80	120	150	
Installation cost	£46	£46	£46	£82	£110	£131	£47
Purchase price	£112	£112	£112	£231	£316	£379	£117
Total average cost							£165

¹⁹ The prices, originally in Euros, have been converted in UK Pound at actual currency rate (1Euro=0.9126 GBP).

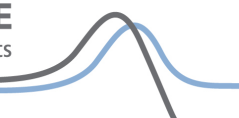


Table 16 Reference case product prices for each ErP size (EI)

WATER HEATERS	XXS	XS	S	M	Reference Scenario
Electric instantaneous [EI]					Sales- Weighted Average
Min power ²⁰ (kW)	6.3	12.5	15.7	18.8/23.3	
Installation cost	£46	£ 46	£91	£91	£49
Purchase price	£224	£290	£ 383	£409	£212
Total average cost					£260

Table 17 Reference case product prices for each ErP size (EIH)

WATER HEATERS	XXS	XS	Reference Scenario
Electric showers [EIH]			Sales- Weighted Average
Min power (kW)	6.3	12.5	
Installation cost	£46	£46	£46
Purchase price	£182	£182	£182
Total average cost			£228

- The Reference average installed cost of: an electric storage water heater (ES) is £165 (incl.VAT); an electric instantaneous electric heater (EI) is £246 (incl.VAT) and: an electric instantaneous heater fitted with electronic flow rate control (EIH) is £228 incl.VAT).

5.3 Methodology & key assumptions – Cost

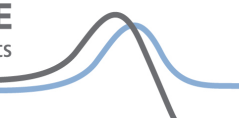
- In this Policy Scenario it was assumed the cost to the consumer would include the increased purchase and installation costs of each product modelled in relation to the Reference Scenario²¹ in order to meet the efficiency targets set by the ErP policy.
- The additional cost has been calculated as the difference between the Reference Scenario purchase price for dedicated domestic electric water heaters (ES, EI and EIH)²² and the price of the same technology with improved efficiency.
- It is assumed that all cost increases faced by industry will be passed on to the consumer.
- The additional cost of the Policy Scenario has been estimated against the Reference Scenario costs found in Table 15,

²⁰ Quoted in the ErP Working Document on possible Ecodesign Energy labelling and Installation requirements for Water Heaters (July 2008): Minimum power of 100/80% efficiency at steady state.

²¹ BNDH EWH02: Domestic Electric Water Heaters Government Standards Evidence Base 2009:

Reference Scenario

²² Preparatory Study on Eco-design of Water Heaters – Task 5 Definition of Base Case (FINAL)



- Table 16 and Table 17.
- Cost data are available for 2006 only; results have been extrapolated for years 2009-2030.
- It is assumed that the cost differentials will be constant in time.
- Table 19 and Table 20 display the product costs of domestic electric water heaters, comprising installation and purchase costs, for the Policy Scenario (ErP 2011-2013-2015) and Reference Scenario.

Table 18 ES Water heater costs for Policy Scenario (ErP 2011, 2013 and 2015).

STORAGE WATER HEATERS ES	Reference	ErP 2011	ErP 2013	ErP 2015
Installation cost	£47	£49	£49	£86
Purchase price	£117	£182	£182	£182
Total average cost	£165	£232	£232	£269

Table 19 EI Water heater costs for Policy Scenario (ErP 2011, 2013 and 2015)

ELECTRIC WATER HEATERS EI	Reference	ErP 2011	ErP 2013	ErP 2015
Installation cost	£49	£49	£49	£49
Purchase price	£237	£297	£297	£297
Total average cost	£285	£345	£345	£346

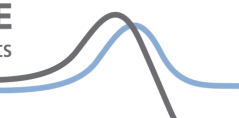
Table 20 EIH Water heater costs for Policy Scenario (ErP 2011, 2013 and 2015)

ELECTRIC WATER HEATERS EIH	Reference	ErP 2011	ErP 2013	ErP 2015
Installation cost	£46	£46	£46	£46
Purchase price	£85	£182	£182	£182
Total average cost	£130	£227	£227	£227

Future analysis

Table 21 Extrapolation & background calculations – cost

Year	Methodology & assumptions
2009 - 2030	Average product purchase prices for Reference and the Policy Scenarios (ErP 2001-20013-2015) are from the Preparatory Study on Water Heaters-Task 5. These are weighted by sales to give average cost for each product group as shown in Table 15, Table 16 and Table 17.
2009-2030	The cost differential (purchase price and installation cost) for more efficient products remains constant.



5.4 Data issues – cost

- Cost data are generally scarce. However some industry stakeholders have provided useful information.
- Most cost data have been obtained from the Preparatory Study on Eco-design of Water Heaters (Task 5 and task 6). These data are European averages.

Table 22 Data issues – cost

Issue/risk	Approach taken/rationale
Scarce cost data	The information about cost has been taken from the ErP preparatory study and from engagement with some manufacturers.
Cost data derived from European averages	Converted to GBP using conversion factor from 03/04/09: €1 = £0.9126

5.5 Confidence level – cost

- Confident level is low due to reliance on EU-wide data, and assumption that cost differentials remain constant over time.

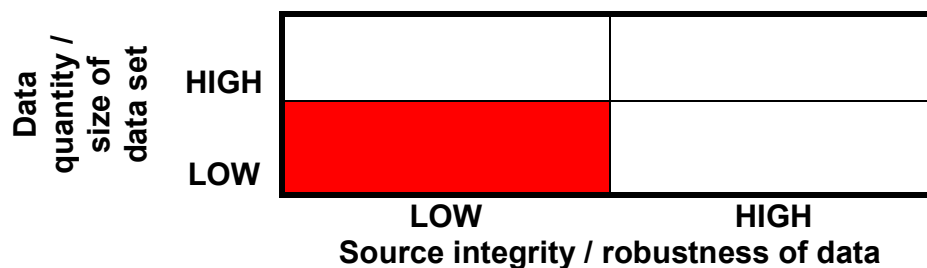
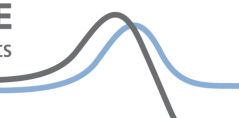


Figure 5 Confidence indicator for cost data



Related MTP information

- BNDH EWH01: Domestic Electric Water Heaters Government Standards Evidence Base 2009: Key Inputs
- BNDH EWH02: Domestic Electric Water Heaters Government Standards Evidence Base 2009: Reference Scenario
- BNDH EWH04: Domestic Electric Water Heaters Government Standards Evidence Base 2009: BAT Scenario
- BNDH KO01: Domestic Central Heating Government Standards Evidence Base 2009: Key outputs

Changes from previous version

- None. This is the first published version

Consultation and further information

Stakeholders are encouraged to review this document and provide suggestions that may improve the quality of information provided, email info@mtprog.com quoting the document reference, or call the MTP enquiry line on +44 (0) 845 600 8951.

For further information on related issues visit <http://efficient-products.defra.gov.uk>