

# **Water Labelling: Taps and Showers Only Comparison**

Southern Water and Waterwise

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## 1 Background

Energy Saving Trust were previously commissioned by Waterwise, Defra and the water companies' Collaborative Fund to carry out a cost benefit analysis into options for improved water efficiency labelling of domestic fittings and appliances in the UK. That study concluded that the most cost-effective option would be to introduce a mandatory, government led water label, and to link it to standards in building regulations, and to new minimum performance standards for the sale of fittings and appliances.

A second study looked at this preferred option in more detail, modeling different levels of ambition and taking a more cautious view with greater additional costs for efficient appliances. This study concluded that there was no reduction on cost benefit ratio through aiming for the most ambitious standards achievable with existing technology.

The Department for Business, Energy and Industrial Strategy (BEIS) has now launched a Call for Evidence on options for changes to energy labelling and minimum standards in the UK, including introducing energy labels for taps and showers. Southern Water and Waterwise have therefore commissioned this follow-on work to re-run the calculations, showing the impact of an energy label that only regulates taps and showers, and comparing this to the impacts from a wider water label. The study also produces impact projections in a format tailored to meet certain specific questions in the Call for Evidence.

## 2 Methodology Overview

The methodology for this study draws heavily on the results from the previous studies, and so on the methodology used in those studies. Full details of the original methodologies can be found in the relevant technical reports available here:

<https://waterwise.org.uk/knowledge-base/water-labelling-phase-1-project-summary-report-2018/>

<https://waterwise.org.uk/knowledge-base/water-labelling-phase-2-project-technical-report/>

To consider the impact of an energy label for taps and showers, we took the view that this would be the same as that of a water label applied only to taps and showers. This is based on two assumptions:

- All new non-mixer taps would be treated identically whether intended for hot or cold use. In principle an energy label would apply only to hot taps and it would be possible to continue selling cold taps without a label and without meeting any new standards. However, as taps are generally sold either as a pair, or with the option to be used as either hot or cold, we considered this possibility to have little appeal to industry, and so discounted it.
- The reduction in flow rates would be equivalent in both an energy label and a water label. The BEIS Call for Evidence does not specify reduction rates or give any other indication of the level of ambition under consideration. We therefore used the range of reduction rates modelled in the second water labelling study to provide comparisons between energy and water labelling at equivalent levels of ambition.

The first water labelling study presented results for a 10 year and 25 year timeline, but prioritised the 10 year results due to their greater reliability. The second study primarily presented 25 year outputs, as the more detailed analysis included phased introduction of the more ambitious scenarios, which required a longer time frame in order to display the full scale of the different impacts. To minimise confusion we have used the 25 year outputs from the first study in this report. This facilitates comparison between options, but it does mean that numbers quoted here will often differ from the headline figures quoted in the first water labelling report.

### 3 Results

The summary results from the initial water label study are shown in Table 1.

Cost/Benefit	Type	Units	Scenario1	Scenario2	Scenario4	Scenario5	Scenario6	Scenario7	Scenario8
<b>Costs</b>	Government	£ Million	£8.3	£10.4	£5.8	£6.9	£0.0	£0.0	£0.0
	Industry	£ Million	£0.0	£0.0	£0.0	£0.0	£5.1	£13.4	£6.2
	Manufacturers	£ Million	£56.9	£129.6	£19.4	£23.0	£16.7	£28.3	£23.7
<b>Water Savings</b>	Water Savings	MI	2,323,554	6,846,129	522,803	1,896,277	314,757	561,239	672,351
<b>Energy Savings</b>	Hot Water Energy Savings	MWh	57,299	167,114	11,118	40,196	7,215	15,185	18,672
<b>Financial Savings</b>	Household Water Bill Savings	£ Million	£2,188.1	£6,561.8	£352.4	£1,770.2	£167.7	£392.8	£490.0
	Household Energy Bill Savings	£ Million	£2,413	£7,468	£393	£2,025	£200	£650	£839
	Water Supplier Savings	£ Million	£134.7	£409.3	£31.7	£114.7	£19.3	£34.3	£41.1
<b>GHG Emission Savings</b>	Embodied Water Emissions Savings	tCO2e	2,444,379	7,202,128	549,988	1,994,883	331,124	590,424	707,313
	Household Energy Emissions Savings	tCO2e	10,599,963	31,260,275	2,095,332	7,584,469	1,362,407	2,863,974	3,521,637
<b>Key Metrics</b>	Cost per Million Litres Saved	£/MI	<b>£28</b>	<b>£20</b>	<b>£48</b>	<b>£16</b>	<b>£69</b>	<b>£74</b>	<b>£44</b>
	Water Saved per Person per Day (10 years)	l/capita/day	<b>1.5</b>	<b>6.3</b>	<b>0.5</b>	<b>2.2</b>	<b>0.3</b>	<b>0.6</b>	<b>0.7</b>
	Water Saved per Person per Day (25 years)	l/capita/day	<b>13.0</b>	<b>31.4</b>	<b>2.4</b>	<b>9.3</b>	<b>1.3</b>	<b>2.4</b>	<b>2.9</b>
<b>Key Metrics (Rankings)</b>	Cost per Million Litres Saved	Ranking	3	2	5	1	6	7	4
	Water Saved per Person per Day (10 years)	Ranking	3	1	6	2	7	5	4
	Water Saved per Person per Day (25 years)	Ranking	2	1	6	3	7	5	4
	Cost:Benefit Ratio	Ranking	3	2	5	1	7	6	4

Table 1 - 25 year summary outputs from first water label study

Seven scenarios were modelled, from an original shortlist of eight – Scenario 3 was dropped. The scenarios are:

- Scenario 1 – Mandatory government-led label, no associated minimum standards
- Scenario 2 – Mandatory government-led label, linked to Building Regulations and minimum standards
- Scenario 4 – Voluntary government-led label, no associated minimum standards
- Scenario 5 – Voluntary government-led label, linked to Building Regulations
- Scenario 6 – Voluntary industry-led label, no associated minimum standards
- Scenario 7 – Voluntary industry-led label, with intensive marketing campaign
- Scenario 8 – Voluntary industry-led label, linked to requirements for funding

All seven scenarios have now been re-modelled with zero take up for all measures except taps and showers. This therefore represents the impact of each scenario if applied only to taps and showers, with the key results shown in Table 2.

Cost/Benefit	Type	Units	Scenario1	Scenario2	Scenario4	Scenario5	Scenario6	Scenario7	Scenario8
Costs	Government	£ Million	£8.3	£10.4	£5.9	£6.9	£0.0	£0.0	£0.0
	Industry	£ Million	£0.0	£0.0	£0.0	£0.0	£5.1	£13.4	£6.2
	Manufacturers	£ Million	£39.4	£76.4	£17.1	£23.0	£16.1	£25.9	£20.5
Water Savings	Water Savings	MI	1,045,365	2,991,872	342,655	705,823	263,038	373,318	427,393
Energy Savings	Hot Water Energy Savings	MWh	32,967	94,362	7,983	19,282	6,067	9,265	10,778
Financial Savings	Household Water Bill Savings	£ Million	£728.1	£2,106.0	£143.1	£394.7	£107.9	£175.8	£207.1
	Household Energy Bill Savings	£ Million	£887	£2,595	£221	£535	£168	£256	£298
	Water Supplier Savings	£ Million	£60.5	£178.1	£20.9	£42.8	£16.1	£22.8	£26.1
GHG Emission Savings	Embodied Water Emissions Savings	tCO <sub>2</sub> e	1,099,724	3,147,449	360,473	742,526	276,716	392,730	449,617
	Household Energy Emissions Savings	tCO <sub>2</sub> e	6,100,245	17,639,113	1,503,822	3,634,482	1,145,346	1,746,746	2,031,743
Key Metrics	Cost per Million Litres Saved	£/MI	<b>£46</b>	<b>£29</b>	<b>£67</b>	<b>£42</b>	<b>£81</b>	<b>£105</b>	<b>£62</b>
	Water Saved per Person per Day (10 years)	l/capita/day	<b>0.7</b>	<b>2.6</b>	<b>0.4</b>	<b>0.8</b>	<b>0.3</b>	<b>0.4</b>	<b>0.4</b>
	Water Saved per Person per Day (25 years)	l/capita/day	<b>5.9</b>	<b>14.1</b>	<b>1.5</b>	<b>3.4</b>	<b>1.1</b>	<b>1.6</b>	<b>1.9</b>
Key Metrics (Rankings)	Cost per Million Litres Saved	Ranking	3	1	5	2	6	7	4
	Water Saved per Person per Day (10 years)	Ranking	3	1	6	2	7	5	4
	Water Saved per Person per Day (25 years)	Ranking	2	1	6	3	7	5	4
	Cost:Benefit Ratio	Ranking	2	1	5	3	6	7	4

**Table 2 - 25 year outputs from first study, taps and showers only**

Scenario 2 (Mandatory government-led label, linked to Building Regulations and minimum standards) was the preferred option from the initial study, and so was considered in more detail in the second study. Four levels of ambition for Scenario 2 were considered, as follows:

- **Tightest new build standards in UK currently** – as currently applied to new build properties in Wales and some parts of England, but applied here to all new purchases and installations. Equivalent to **110 litres per person per day** in the English building regulations water efficiency calculation methodology.
- **10% better than current best standards** – approximately 10% tighter standard than the above. Equivalent to **100 litres per person per day** in the English building regulations water efficiency calculation methodology.
- **Best commercially available domestic technology** – requiring all purchases and installations to use the best technology currently commercially available in the UK domestic market. Equivalent to **95 litres per person per day** in the English building regulations water efficiency calculation methodology.
- **Best commercially available technology** – requiring all purchases and installations to use the best technology currently commercially available in the UK, whether for the domestic or non-domestic market. Equivalent to **85 litres per person per day** in the English building regulations water efficiency calculation methodology.

The key results for these four sub-scenarios, modelled over 25 years, are presented in Table 3. Please note that there were a number of changes in assumptions and methodology between the two studies, and so figures in the following tables should not be compared directly with those in the first two.

Cost/Benefit		Type	Units	110 LPD	100 LPD	95 LPD	85 LPD
Costs	Total	Total Absolute Cost	£ Million	£325.8	£344.8	£357.8	£405.3
		Average Cost per Household	£ per household per year	£0.55	£0.58	£0.60	£0.68
Benefits for Households	Water	Total Cumulative Water Saved	Million Litres (Ml)	6,684,877	7,718,805	8,082,162	8,987,406
		Water savings in year 25:	Million litres per day	1,313	1,531	1,604	1,844
		Water savings in year 25:	Litres per capita per day	22.3	26.0	27.2	31.2
	Financial	Total Bill Savings	£ Million	£17,218	£22,194	£23,551	£26,225
		Average Saving per Household	£ per household per year	£29	£37	£40	£44
Benefits in CO <sub>2</sub> Reduction		Total Emission Savings	MtCO <sub>2</sub> e	38.80	48.07	50.79	55.91
Cost:Benefit Ratio		Combined	Ratio	1:55	1:67	1:68	1:67

Table 3 - 25 year summary results from second water label study

These four sub-scenarios were then re-modelled for taps and showers only, giving the results shown in Table 4.

Cost/Benefit		Type	Units	110 LPD	100 LPD	95 LPD	85 LPD
Costs	Total	Total Absolute Cost	£ Million	£92.9	£95.6	£97.5	£104.4
		Average Cost per Household	£ per household per year	£0.16	£0.16	£0.16	£0.18
Benefits for Households	Water	Total Cumulative Water Saved	Million Litres (Ml)	4,152,903	4,862,769	5,162,667	5,373,998
		Water savings in year 25:	Million litre per day	780	937	998	1,063
		Water savings in year 25:	Litres per capita per day	13.3	15.9	17.0	18.0
	Financial	Total Bill Savings	£ Million	£11,914	£14,050	£14,983	£15,713
		Average Saving per Household	£ per household per year	£20	£24	£25	£26
Benefits in CO <sub>2</sub> Reduction		Total Emission Savings	MtCO <sub>2</sub> e	26.90	31.99	34.22	36.16
Cost:Benefit Ratio		Combined	Ratio	1:133	1:153	1:160	1:156

Table 4 - 25 year summary results from second study, taps and showers only

The difference between the two sets of results is shown in Table 5. This table shows the additional savings that can be achieved by introducing a wider water label rather than just the energy label, for each of the levels of ambition, and the additional costs that would go with that. Cost:benefit is not included in this table as subtracting one ratio from another is not meaningful.

Cost/Benefit		Type	Units	110 LPD	100 LPD	95 LPD	85 LPD
Costs	Total	Total Absolute Cost	£ Million	£232.9	£249.1	£260.3	£300.9
		Average Cost per Household	£ per household per year	£0.39	£0.42	£0.44	£0.51
Benefits for Households	Water	Total Cumulative Water Saved	Million Litres (Ml)	2,531,974	2,856,035	2,919,495	3,613,408
		Water savings in year 25:	Million litre per day	534	594	606	781
		Water savings in year 25:	Litres per capita per day	9.0	10.1	10.3	13.2
	Financial	Total Bill Savings	£ Million	£5,304	£8,144	£8,568	£10,512
		Average Saving per Household	£ per household per year	£9	£14	£14	£18
Benefits in CO <sub>2</sub> Reduction		Total Emission Savings	MtCO <sub>2</sub> e	11.90	16.08	16.58	19.76

Table 5 - Additional costs/savings from wider water label

The difference is shown as a percentage increase in Table 6. The cost:benefit change is included in this table, and shows as a negative number as the ratio is lower for the wider label.

Cost/Benefit		Type	110 LPD	100 LPD	95 LPD	85 LPD
Costs	Total	Total Absolute Cost	251%	260%	267%	288%
		Average Cost per Household	251%	261%	267%	288%
Benefits for Households	Water	Total Cumulative Water Saved	61%	59%	57%	67%
		Water savings in year 25:	68%	63%	60%	73%
	Financial	Total Bill Savings	45%	58%	57%	67%
		Average Saving per Household	45%	58%	57%	67%
Benefits in CO <sub>2</sub> Reduction		Total Emission Savings	44%	50%	48%	55%
Cost:Benefit Ratio		Combined	-41%	-44%	-43%	-43%

Table 6 - Percentage increase in costs/savings from wider water label

The BEIS Call for Evidence asks for estimates of savings from an energy label for taps and showers, over certain specified timeframes. We have therefore extracted the relevant snapshots from the core data, and present them here for a full water label in Table 7, and for an energy label covering taps and showers only in Table 8.

	1 Year Total	2 Year Total	3 Year Total	5 Year Total	10 Year Total	25 Year Total
Energy saved (MWh/yr)	249	769	1,582	5,459	30,675	243,743
Water saved Ml/yr	9,588	29,876	61,644	206,357	1,134,765	8,987,406
CO <sub>2</sub> e saved (tCo <sub>2</sub> e/yr)	60,633	187,311	385,021	1,313,372	7,258,880	55,912,126
Bills saved (£ million)	43	128	258	860	4,421	26,225

Table 7 - savings from a full water label over different timescales

	1 Year Total	2 Year Total	3 Year Total	5 Year Total	10 Year Total	25 Year Total
Energy saved (MWh/yr)	157	494	1,033	3,601	20,314	160,035
Water saved Ml/yr	5,496	17,200	35,831	125,489	704,653	5,373,998
CO <sub>2</sub> e saved (tCo <sub>2</sub> e/yr)	37,683	118,117	246,366	854,596	4,757,108	36,156,231
Bills saved (£ million)	26	80	163	544	2,755	15,713

Table 8 - savings from an energy label for taps and showers only over different timescales



## 4 Discussion

Table 2 shows that, if considering an energy labelling approach for taps and showers only, a mandatory government-led label linked to building regulations and minimum standards is the most attractive option of the scenarios considered. Unsurprisingly, this saves the most water, energy and carbon dioxide, overall and per person. However, it also delivers the best cost:benefit ratio of all the options, and the lowest cost per million litres saved.

By comparison, Table 1 shows that a wider water label would save considerably more water, energy and carbon dioxide. However, several modifications were made to the original modelling assumptions when carrying out the second study, and so direct comparisons between a mandatory energy label linked to standards and a water label linked to standards should be made using the second study results. These are expressed in Tables 3 to 6.

These results show that a wider water label would save more water, energy bills and carbon dioxide than an energy label for taps and showers, by a factor ranging from 44% to 73% more depending on the metric and level of ambition. The most ambitious scenario shows the greatest proportional benefit from expanding the scope.

As expected, the amounts of water, energy and carbon dioxide saved are greatest for the most ambitious scenario. The additional benefits from a wider water label, assuming the most ambitious approach, amount to an extra 3.6 million megalitres of water, and nearly an extra 20 million tonnes of carbon dioxide equivalent over 25 years. This would reduce per capita water consumption by an extra 13 litres per person per day compared to an energy label only.

An ambitious energy label for taps and showers is projected to reduce water consumption by just over 1,000 megalitres per day within 25 years. By comparison, the wider water label is expected to reduce consumption by just over 1,800 megalitres per day, or half the expected national shortfall.

The cost:benefit of a wider water label is not as positive as an energy label only, but is still strongly positive at around 1:67 for most scenarios. In all the modelling carried out, none of the outputs suggest any financial argument for limiting the ambition of a labelling scheme, whether for an energy label or a water label.

## 5 Recommendations

On the basis of this modelling, there is very good evidence for introducing labelling and minimum standards for taps and showers, but there is equally good evidence for expanding that labelling to include other water using appliances. We therefore recommend that the UK Government takes a co-ordinated approach to labelling and regulation for household appliances and fittings. This should include both an energy label and a water label, with the water labelling covering a wide range of domestic water using fittings and appliances.

We recommend special consideration of how best to present information to consumers where a product uses both energy and water. There is considerable international experience in both separate and combined energy and water labels, and this should be used to determine best practice and maximise effectiveness.

The UK has well established needs to reduce both carbon dioxide emissions and water consumption, and it therefore makes sense to tackle both of these issues at once where appropriate. Given the overlap between energy labelling and water labelling opportunities, a co-ordinated approach across both resource requirements will give the most cost-effective solution to the combined policy objectives.

None of our research has suggested any credible counterarguments to this approach, or any arguments for limiting the ambition of labelling schemes and minimum standards for any water using products.