

Water use in the UK food and drink industry



A review of water use in the food and drink industry in 2007 and 2010, by sub-sector and UK nations

WRAP's vision is a world without waste,
where resources are used sustainably.

We work with businesses, individuals and
communities to help them reap the
benefits of reducing waste, developing
sustainable products and using resources
in an efficient way.

Find out more at www.wrap.org.uk

Written by: Katie Bromley-Challenor⁽¹⁾, Mark Kowalski⁽²⁾, Richard Barnard⁽³⁾, Stephen
Lynn⁽²⁾

Affiliation: ⁽¹⁾ Hyder Consulting Ltd, ⁽²⁾ WRc plc, ⁽³⁾ Ashact Consulting Ltd

Front cover photography: Water imagery

While we have tried to make sure this report is accurate, we cannot accept responsibility or be held legally responsible for any loss or damage arising out of or in connection with this information being inaccurate, incomplete or misleading. This material is copyrighted. You can copy it free of charge as long as the material is accurate and not used in a misleading context. You must identify the source of the material and acknowledge our copyright. You must not use material to endorse or suggest we have endorsed a commercial product or service. For more details please see our terms and conditions on our website at www.wrap.org.uk

Contents

- 1.0 Objectives..... 2**
- 2.0 Overall results 2**
- 3.0 Background 5**
 - 3.1 Sector size.....5
 - 3.2 UK water use.....5
 - 3.3 Water use in UK manufacturing.....6
- 4.0 Food and drink manufacturing 7**
 - 4.1 Manufacturing..... 10
- 5.0 Wholesale and retail 11**
 - 5.1 Opportunities in Wholesale and Retail 11
- 6.0 Hospitality and food service 12**
 - 6.1 Opportunities in Hospitality and food service 12
- 7.0 The food and drink industry water reduction target..... 13**
- 8.0 Recommendations 14**
- 9.0 Data sources and methodology 16**
 - 9.1 Water data 16
 - 9.2 2010 water use data 16
- Glossary of terms 18**
- Data tables 20**

1.0 Objectives

Objectives

- establish a baseline for water use in food and drink industry in the UK, by country, by sector and by key product categories for 2007 and 2010;
- understand the potential for the food and drink industry, its sectors and product category sectors to reduce water use (through identification of benchmark and other data, where available), to identify best practice and recommend where the focus for future action should be;
- understand the impact that water use reduction activities, including the Federation House Commitment, may have on delivering the overall [Food Industry Sustainability Strategy \(FISS\)](#) target, and
- inform understanding and strategy for future water efficiency strategy and activity.

FISS target

Food and drink industry water reduction target of 20% by the year 2020, against a 2007 baseline¹.

2.0 Overall results

In line with the [FISS](#), this study defines the food and drink industry as four sectors²:

- [manufacturing](#);
- [retail](#);
- [wholesale](#); and
- [hospitality and food service](#).

The total water use for each sector for 2007 and 2010 is shown in Figure 1. The food and drink manufacturing, and hospitality and food service sectors represent the highest water users in 2010. This represents 53.4%, and between 44.3% and 43.3% total water use in the food and drink industry, respectively.

UK food and drink industry headlines

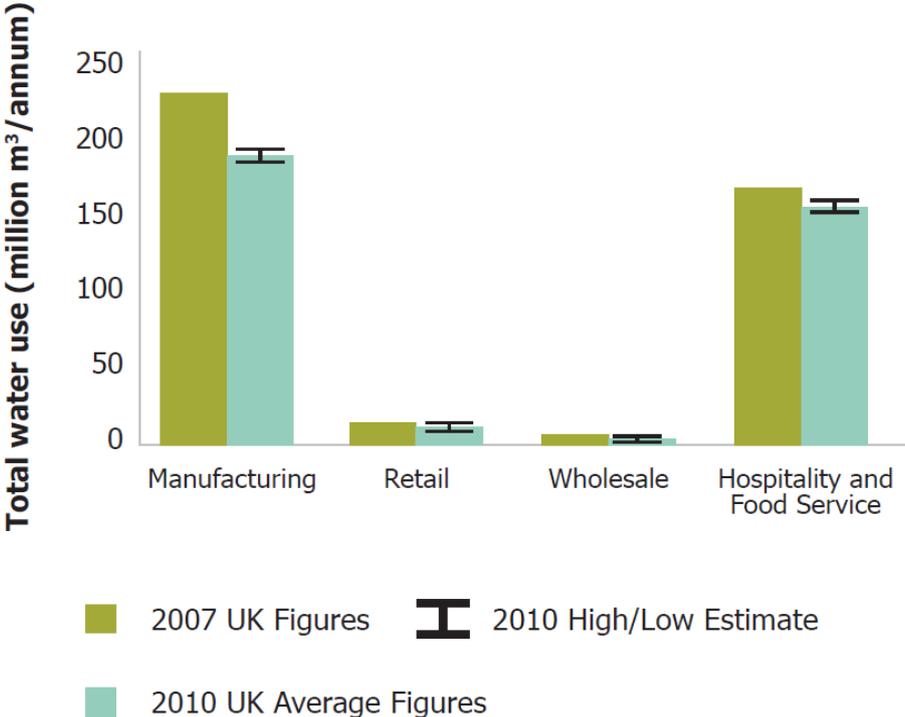
- 2007 total water use was estimated to be 412 million m³;
- 2010 total water use was estimated to be between 347 million m³ and 366 million m³; and
- this represents a water reduction of up to 64.4 million m³ (up to 15.6% reduction).

Reductions in water use in manufacturing, retail and wholesale are thought to relate to improvements in water management. However, two-thirds of the reduction in the hospitality and food service sector can be accounted for by changes in activity, through declines in production and employment.

¹ [Water use excluding that in product](#).

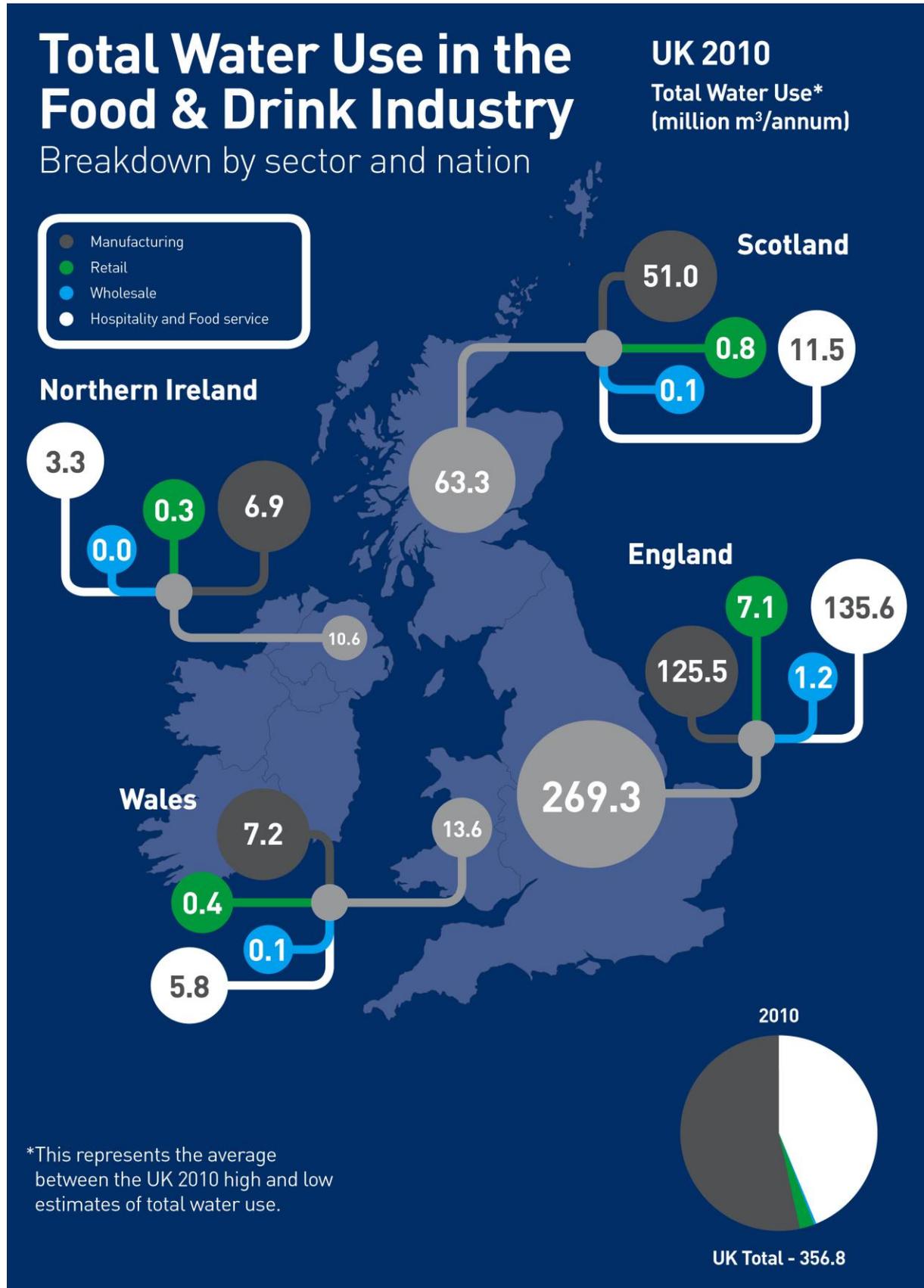
² Further definition of each sector is provided by the [Standard Industrial Classification \(SIC\)](#).

Figure 1: Total water use comparison between 2007 and 2010 ([Methodology](#), [Data](#))



A snapshot of total water use by nation, and food and drink sector can be seen in Figure 2.

Figure 2: Total water use, with breakdown by sector and nation³



³ 2010 data represents the average of the low and high estimate of UK total water use (Table 6). Size of circles is not to scale.

3.0 Background

There are limitations in the original [FISS](#) estimate of water use in 2006. Hence WRAP commissioned a study to obtain a better understanding of how much water was used within the UK food and drink industry in 2007 and 2010. Therefore, the analysis uses more robust data where available, shows whether there has been a reduction in water use since 2007, provides more detail on water use progress by the sector, and what contribution has already been made to the industry target to reduce water usage.

This summary report provides the headline findings from the study. The full report "Water use in the UK food and drink industry" is available on the [WRAP website](#).

3.1 Sector size

The size of each of the food and drink sectors can be expressed as production, the number of meals served and employment and is summarised in Table 1.

Table 1: Changes in the food and drink sectors between 2007 and 2010

Food and drink sector	Employment (thousands)		Change compared to 2007	Production (million tonnes)		Number of meals (billions)	
	2007	2010		2007	2010	2007	2010
Food and drink manufacturing	386	402	4% increase	80.2	79.1	N/A	N/A
Retail	1,181	1,180	0.1% decrease	N/A	N/A	N/A	N/A
Wholesale	191	194	2% increase	N/A	N/A	N/A	N/A
Hospitality and food service	1,920	1,895	1% decrease	N/A	N/A	8.7	8.2

N/A = not applicable

Between 2007 and 2010 total employment in the food and drink industry was 3.7 million; hospitality and food service is the largest sector, representing around half the overall employment (52%) in the food and drink industry in 2007 and 2010.

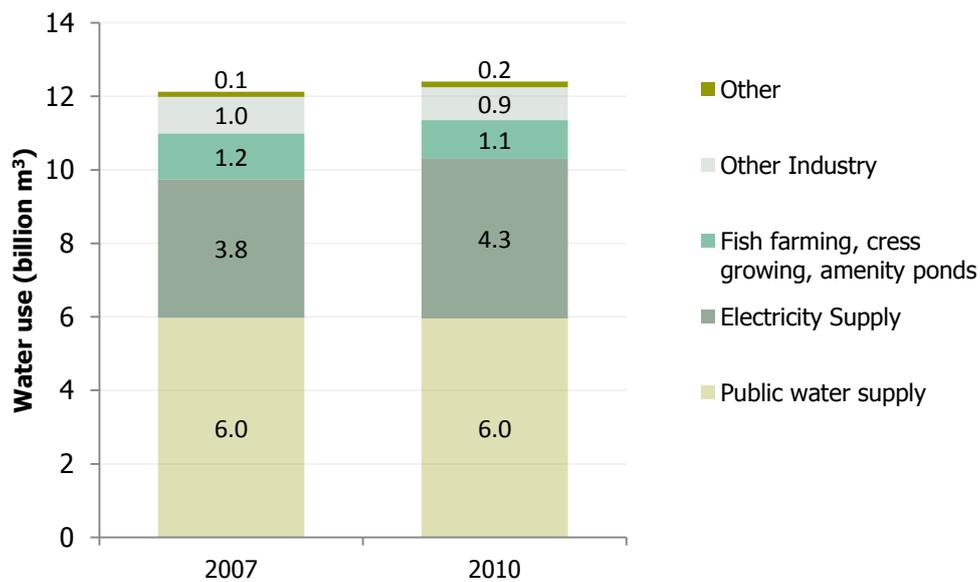
Overall there has been little change in employment between 2007 and 2010 (0.2% decrease); the manufacturing sector has shown a 4% increase between 2007 and 2010.

3.2 UK water use

- 12 billion m³ of water was abstracted from surface and groundwater sources across England and Wales in 2007 and 2010;
- of this, around half (6.0 billion m³) was used for public water supply, with the remainder primarily used directly by industry, for electricity supply and agriculture⁴; and
- WRAP's [Freshwater availability and use report in the UK](#) (WRAP, 2011) estimates that total [consumptive use](#) is no more than 15% of the total volume directly abstracted by UK industry and commerce (i.e. excluding public water supply).

⁴ <http://www.defra.gov.uk/statistics/environment/inland-water/iwfg12-abstrac/>

Figure 3: Abstractions from non-tidal surface water and groundwater by use: 2007 and 2010 (England and Wales) (Source: Environment Agency [data download](#))

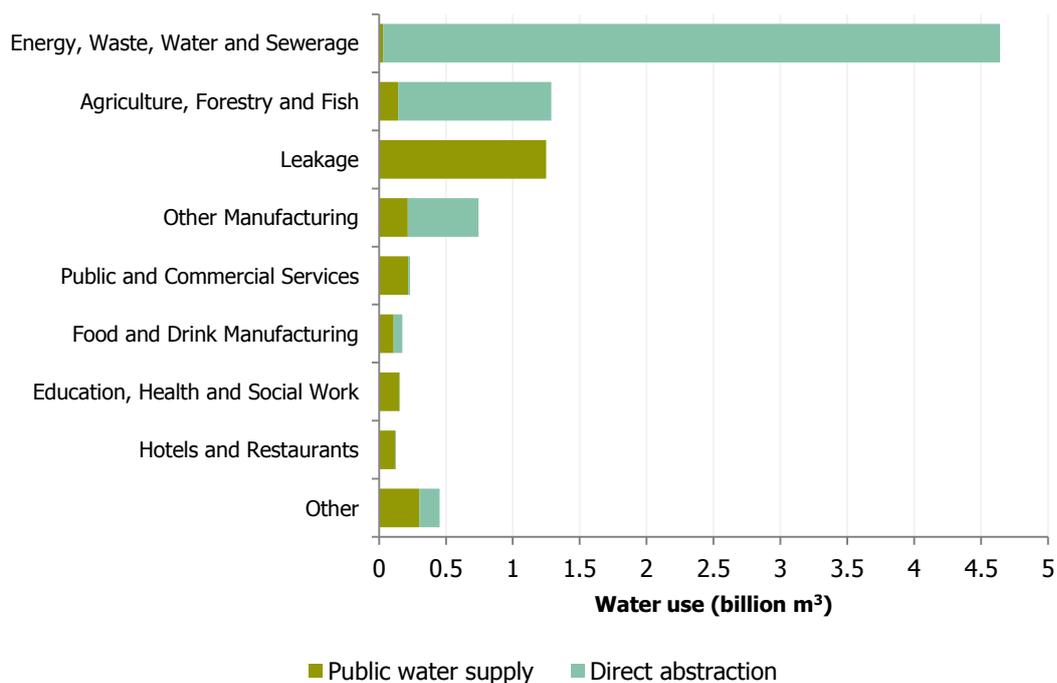


3.3 Water use in UK manufacturing

Previous studies

- water use in manufacturing in England and Wales, in 2006/07, accounted for 10% total water use (916 million m³); and
- food and drink manufacturing contributed an estimated 173 million m³ total water use (2%); 109 million m³ public supply and 64 million m³ direct abstraction (DEFRA).

Figure 4: Water use by industry in England and Wales, 2006/07 (Source: DEFRA)



4.0 Food and drink manufacturing



UK food and drink manufacturing headlines

- 2007 total water use was estimated to be 231 million m³ water per year. Of this, 16.6 million m³ is used as raw material in the product, with processing water the larger proportion and being key in water management.
- 2010 total water use was estimated to be between 185 million m³ and 196 million m³; and
- this represents a water reduction of 35 to 46 million m³ (15 to 20% reduction).

Some of this reduction will be attributed to a contraction in production from 71.9 to 71.2 million tonnes between 2007 and 2010⁵. The [sub-sectors](#) included in this study represent 90% of UK food and drink production.

Figure 5: Total water use in UK food and drink manufacturing (2007 and 2010)

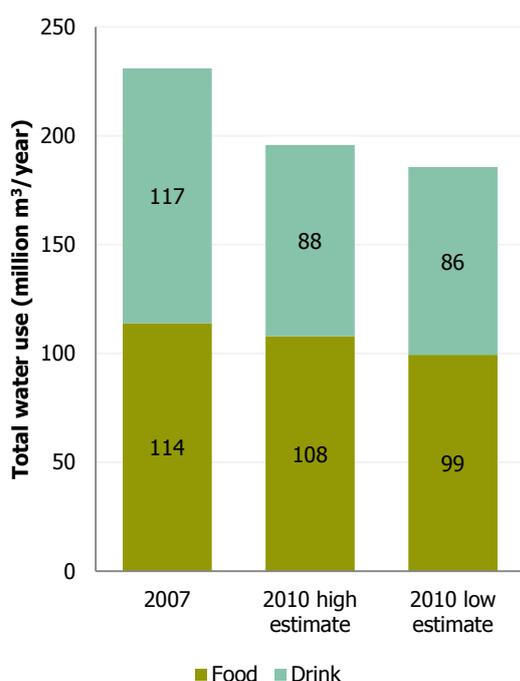
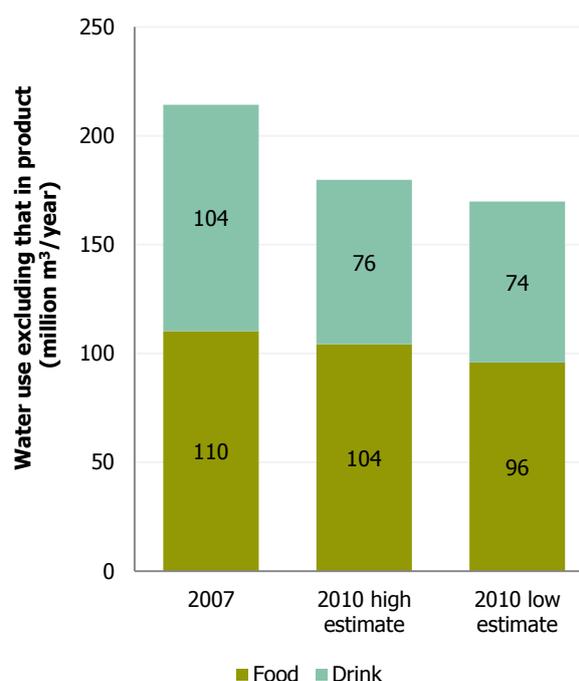


Figure 6: Water use excluding that in product in UK food and drink manufacturing (2007 and 2010)



Where possible, this study draws from actual datasets and data already published. In other cases this has not been possible, so the [methodology](#) relies on modelling of information obtained from a number of [sources](#) and assumptions made to fill any gaps.

⁵ For those [sub-sectors included in this study](#).

Table 2: Top five water-using food and drink manufacturing sub-sectors (in order of descending water use), 2007

2007 Water use (million m ³)		
	Total water use	Water use excluding that in product
1	Spirits	Spirits
2	Meat processing	Meat processing
3	Fruit and vegetables	Fruit and vegetables
4	Brewing	Brewing
5	Soft drinks and beverages	Dairy

Table 3: Top five water-using food and drink manufacturing sub-sectors (in order of descending water use), 2010

2010 Average water use (million m ³)		
	Total water use	Water use excluding that in product
1	Spirits	Spirits
2	Meat processing	Meat processing
3	Brewing	Fruit and vegetables
4	Fruit and vegetables	Brewing
5	Soft drinks and beverages	Dairy

Note: Defined as the average of the [2010 high](#) and [low estimates](#).

The top five sub-sectors by water use (Table 3) shows importance of supporting these sectors to manage water use. In particular through water use excluding in product, where there is a greater opportunity for water efficiency practices.

Figure 7: Manufacture of food, total water use, with breakdown by sub-sector ([Data](#))

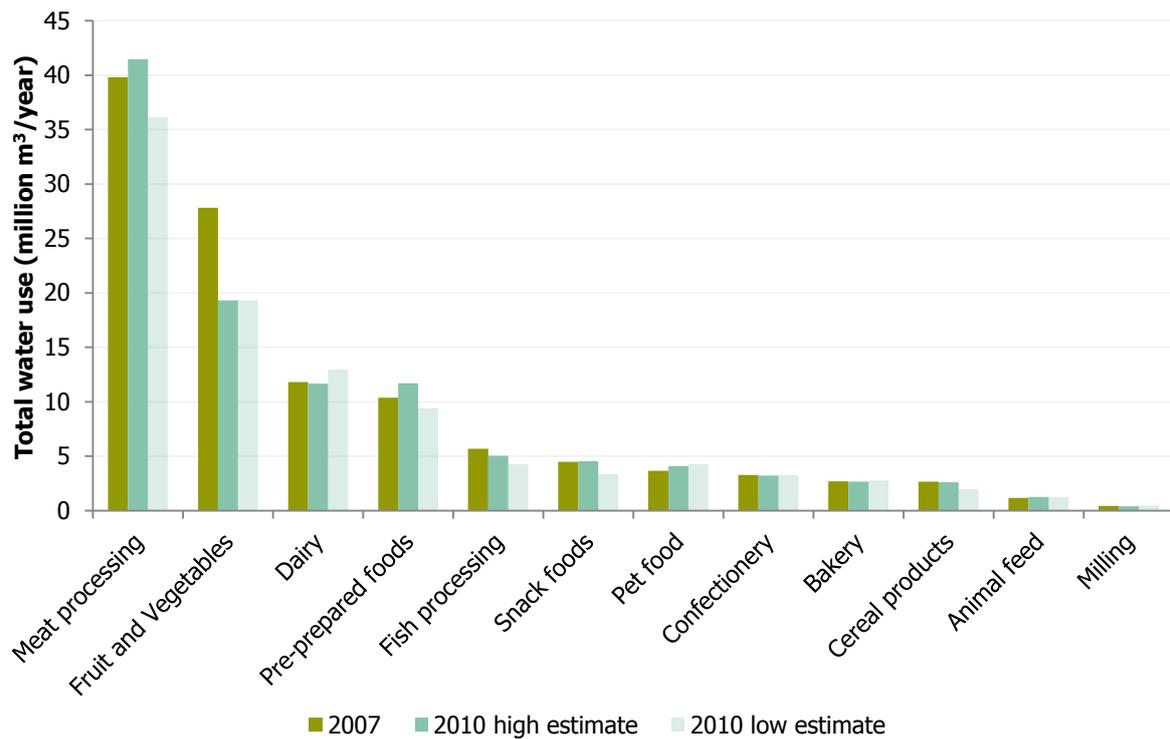
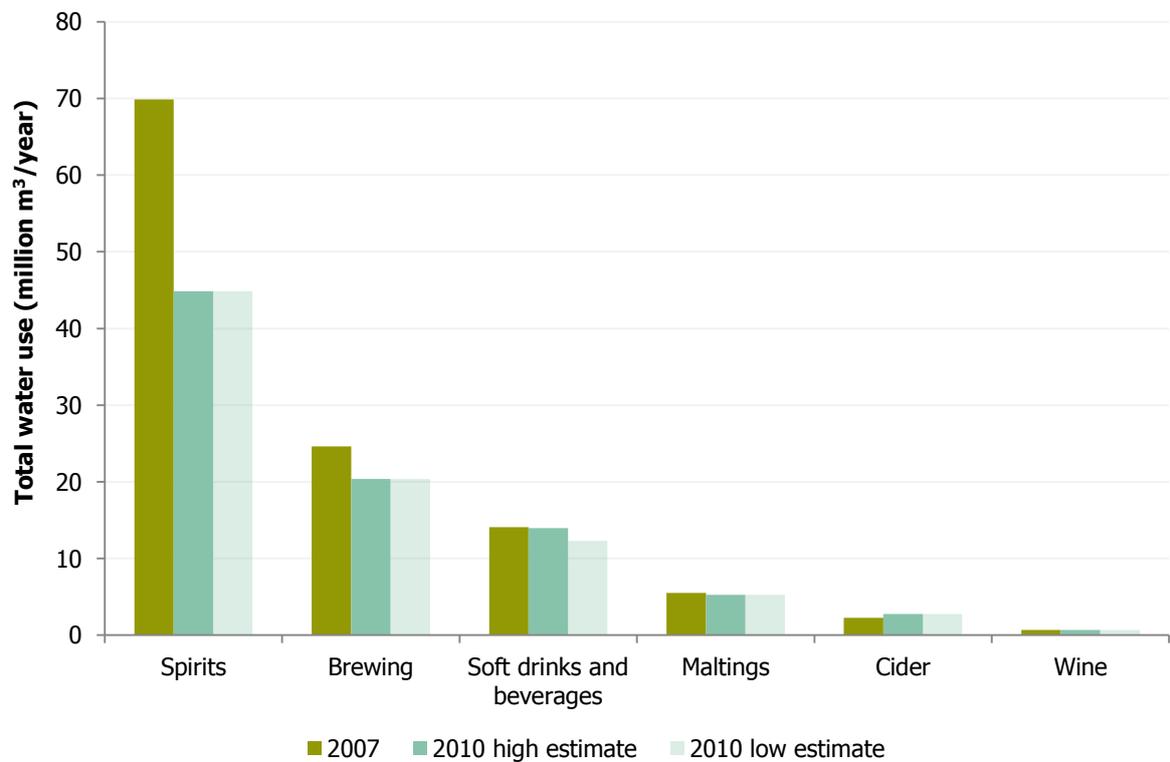


Figure 8: Manufacture of drink, total water use, with breakdown by sub-sector ([Data](#))

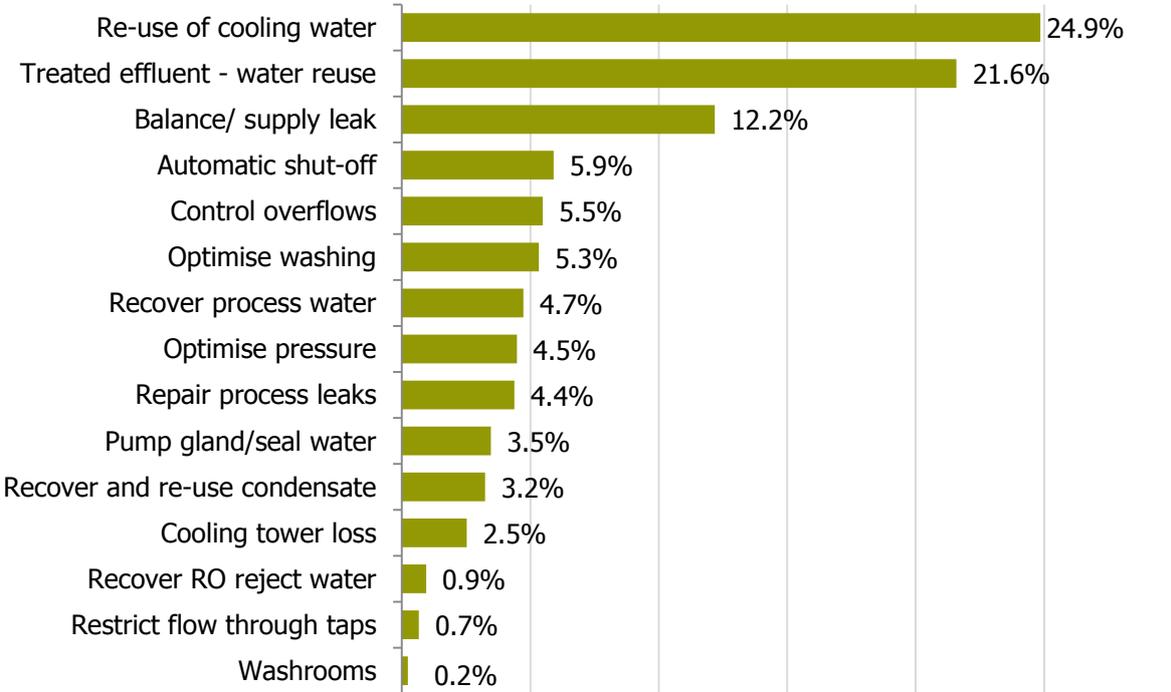


4.1 Manufacturing

Based on a sample of food and drink manufacturing sites visited⁶, average water savings of 12% were identified (based on the total site water use for 2011). This highlights that there are still water saving opportunities to be made. With the exception of effluent treatment and recovery of water for reuse, many opportunities relate to relatively simple process or operational changes. From the potential savings identified, the top five frequently encountered opportunities were:

1. Elimination of once-through cooling systems (24.9% of identified savings);
2. Checking water balance and fixing supply leaks (12.2% of identified savings);
3. Automatic shut-off (5.9% of identified savings);
4. Control of overflows (5.5% of identified savings); and
5. Optimising water supply pressure (4.5% of identified savings).

Figure 2: Water saving measures identified (% of total water use savings)



⁶ Through the [Federation House Commitment](#) (FHC).



5.0 Wholesale and retail

UK food and drink wholesale headlines

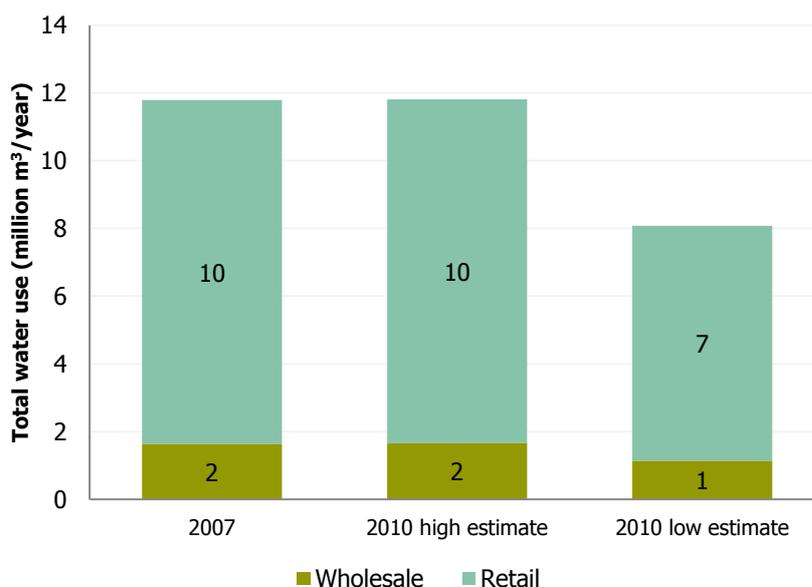
- 2007 total water use was estimated to be 1.6 million m³ water per year;
- 2010 total water use was estimated to be between 1.1 million m³ and 1.6 million m³; and
- this represents a water reduction of up to 0.5 million m³ (up to 32% reduction).

UK food and drink retail headlines

- 2007 total water use was estimated to be 10.1 million m³ water per year;
- 2010 total water use was estimated to be between 6.9 million m³ and 10.1 million m³; and
- this represents a water reduction of up to 3.2 million m³ (up to 32% reduction).

For these sectors, water use has been calculated by applying water use benchmarks to employment data ([methodology](#)). Since there has been little change in employment numbers between 2007 and 2010 the reduction in water use has been attributed to improvements in water management (based on changes in the water use benchmark).

Figure 10: Water use in food wholesale and retail ([Data](#))



5.1 Opportunities in Wholesale and Retail

A review of published material suggests that there has been no previous assessment of UK water use for wholesale and retail. The BRC [A Better Retailing Climate](#) initiative is a collective environmental ambition of leading British retailers to help mitigate the threats of climate change, which has a commitment to measure water use in the retail sector. In addition, many of the large supermarket retailers have incorporated water reduction targets into their sustainability plans and core objectives, including improved recording and monitoring of water use, and the installation of metering.

Since the majority of water use in the wholesale and retail sector comes from employee water, there are still opportunities to reduce water use relating to washroom facilities. For example, there is a large number of effective water saving devices available on the market (both retrofit and new fixtures).

6.0 Hospitality and food service

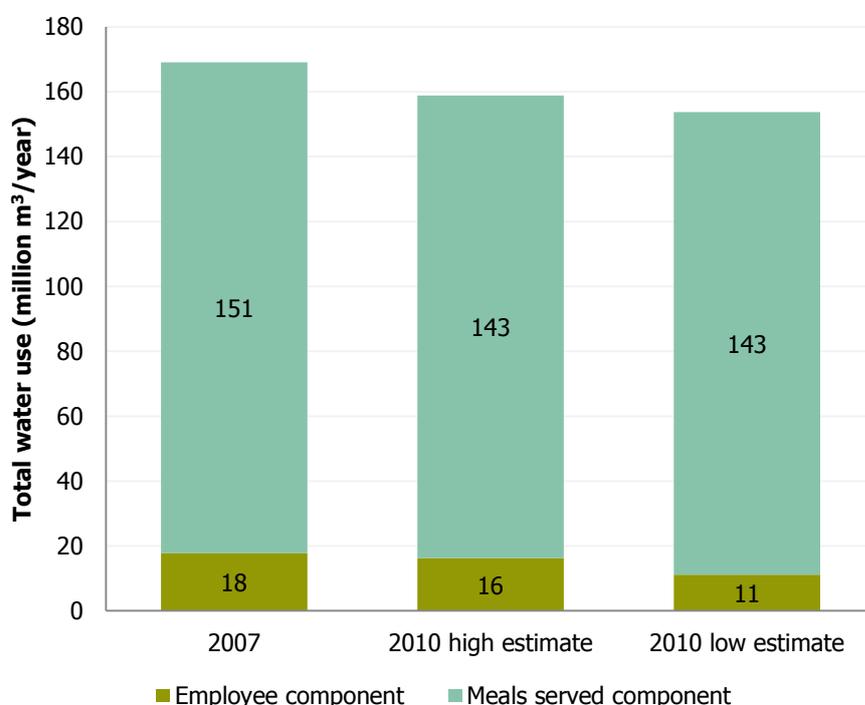


UK hospitality and food service headlines

- 2007 total water use was estimated to be 169 million m³ water per year;
- 2010 total water use was estimated to be between 154 million m³ and 159 million m³; and
- this represents a water reduction of up to 15 million m³ (up to 10% reduction).

Water use has been calculated by applying water use benchmarks to employment data and number of [meals](#) prepared ([methodology](#)). Since there has been a reduction in both employment and the number of meals served between 2007 and 2010, the reduction in water use resulting from these changes has been estimated to be 10.2 million m³. The water reduction attributed to improvements in water management (based on changes in the water use benchmarks) is up to 5.1 million m³.

Figure 11: Water use in hospitality and food service ([Data](#))



6.1 Opportunities in Hospitality and food service

A review of published material suggests that there has been no previous assessment of UK water use for the hospitality and food service sector. In addition, there is little information on the collective uptake of water efficiency measures in the sector.

Water use in the hospitality and food service sector has been calculated as two components: food and preparation, and employee and customer water use. The opportunities to reduce employee water use are the same as those identified for [wholesale and retail](#).

There are also opportunities to reduce water use in food preparation. Catering departments can be areas of high water consumption – particularly those where food is prepared (rather than cooked from chilled). Typically, water uses include: washing and preparing food (particularly potato peelers and salad washing); washing food preparation areas and equipment; cooking; food waste disposal channels; and dishwashers/glasswashers.

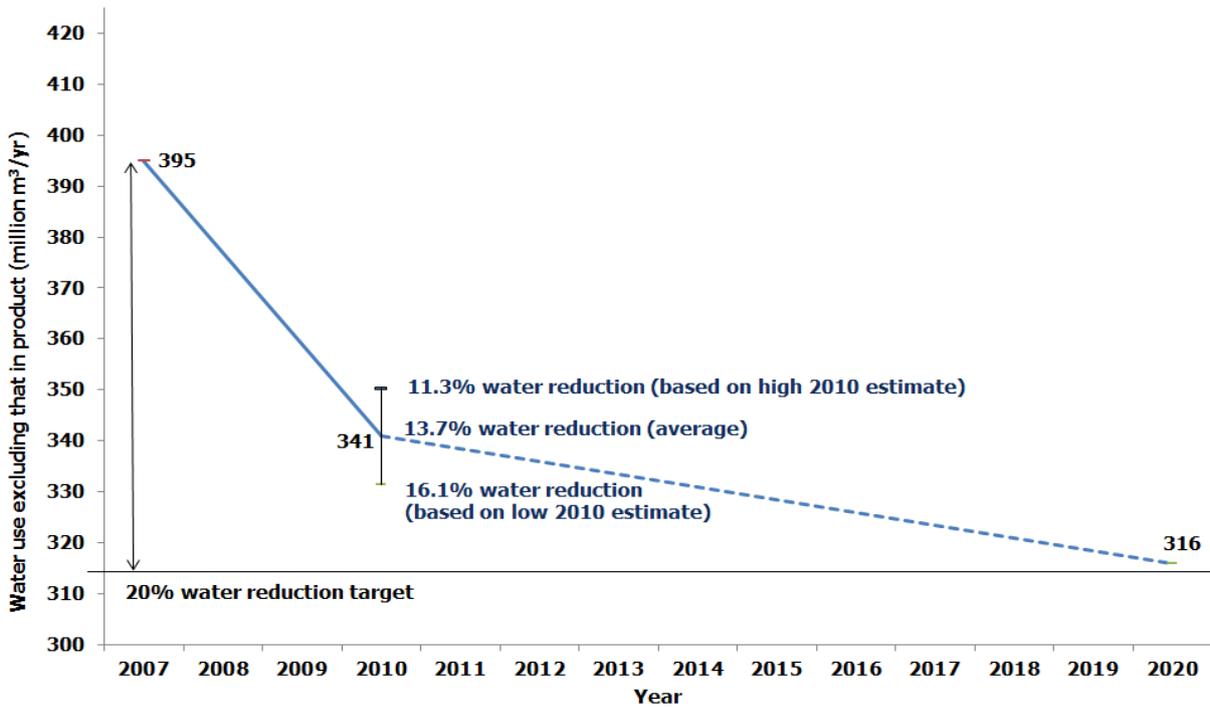
7.0 The food and drink industry water reduction target

The [FISS target](#) for water reduction in the food and drink industry is 20% by 2020 and is based on [water use, excluding that in product](#). In order to assess whether this target is realistic and indeed achievable, water use excluding that in product was calculated for the food and drink industry as part of this study.

The [data collated and analysed](#) in this study suggests that the food and drink industry, has reduced its total water use excluding that in product by 13.7% ± 2.4% between 2007 and 2010. Depending on the assumptions made to estimate [water use in 2010](#), the water reduction could be as low as 11.3% or as high as 16.1% (Figure 3).

While the reductions in water use in manufacturing, retail and wholesale are thought to relate to improvements in water management, two-thirds of the reduction in the hospitality and food service sector can be accounted for by changes in activity. However, it is important to note that the data depends heavily on [benchmarks](#) and other imputed data rather than direct measurement. Confidence in this assertion is dependent on the accuracy of these benchmarks and imputed data⁷.

Figure 3: Water reduction in the food and drink industry, with required annual reduction from 2010 to 2020 to meet food and drink industry target



Note: Where the solid line represents the data calculated in this study (average reduction) and dashed line represents a forecast required reduction in order to meet the industry target of 20% reduction by 2020. The low, average and high estimates refer to the water reduction trend calculated for 2010 ([water excluding that in product](#)). The [high 2010 estimate](#) of 350 million m³, represents 11.3% reduction in water (compared to 395 million m³ in 2007), whereas the [low 2010 estimate](#) of 332 million m³ represents 16.1% reduction in water compared to 2007.

⁷ Further detail in the confidence of the data is discussed for each sector, in the relevant sections of the [full report](#).

8.0 Recommendations

The study identified a number of gaps in the information. The key areas of focus are summarised in Table 4. The complete list can be found in the full report, available on the WRAP website.

Table 4: Summary of key data gaps and recommendations for filling the gaps

Item	Gaps in data	Implications and recommendations for filling the gap
Mains supply data	There is no longer a requirement to publish non-domestic water use data by SIC grouping for the WRMP .	Environment Agency to review requirement of water companies to publish information by aggregated SIC code in their WRMP.
Direct abstraction data	Direct abstraction information (actual volumetric data) for Scotland and Northern Ireland.	<p>The impact on this analysis depends on the number of operations in this sector which use a direct abstraction, and what proportion of the total water use that direct abstraction represents.</p> <p>Separate data improvement programmes are underway in each region, and actual volumetric data is collected in Scotland from 2010/11 and Northern Ireland has been collected since 2007, although data coverage is limited.</p>
	Businesses in England and Wales are no longer required to report actual volumes abstracted to the Environment Agency where the authorised quantity is less than 100 m ³ /day ⁸ .	<p>A risk based decision by the Environment Agency not to collect this information, to help reduce the burden on abstractors.</p> <p>The impact on this analysis depends on the number of operations in this sector which use a direct abstraction where the authorised quantity is less than 100 m³/day and the overall proportion of abstraction that this makes up.</p>
Food and Drink Manufacturing 	<p>Sector (and sub-sector) water use. The majority of water use figures used in this report are extrapolated (applying water use benchmarks to production data).</p> <p>Data not included in this study for the following sub-sectors.</p> <p>Lack of water use and benchmark data:</p> <ul style="list-style-type: none"> ■ manufacture of oils and fats, margarine and similar edible fats; ■ manufacture of macaroni, noodles, couscous and similar farinaceous products; and ■ manufacture of condiments and seasonings. <p>Lack of production data or data disclosure issues:</p> <ul style="list-style-type: none"> ■ manufacture of sugar; and ■ processing of tea and coffee. 	<p>Encourage trade associations to collect members' data to better assess the environmental impact of their sector.</p> <p>These sub-sectors have not been included in the study and they account for 10% of total UK production in 2007 and 2010.</p> <p>The Manufacture of oils and fats, margarine and similar edible fats represent 5% of total UK food and drink production and therefore could have significant influence on the total UK water use for the manufacturing sector.</p> <p>Encourage registration to the FHC.</p>

⁸ Licence holders are still required to keep an on-site record. This is part of a risk-based approach to reduce the burden on abstractors.

Item	Gaps in data	Implications and recommendations for filling the gap
Hospitality and food service 	Actual water consumption data	<p>Water use data is limited for this sector, so benchmarks were used. Since this sector represents around half the employment in the food and drink industry, it could have significant impact on the total UK water use.</p> <p>Recommendations include:</p> <ol style="list-style-type: none"> 1. development of water use benchmarking data by sub-sector within hospitality and food service sector; 2. establishment of a water working group for hospitality and food service to support the collection of data; and 3. establishment of agreed industry targets on reducing water use and strategy on reducing water use, for example, through a Voluntary Agreement. <p>Encourage registration to the Rippleffect programme.</p>
Retail and wholesale 	Actual water consumption data	<p>These sectors represent 37% of UK employment in the food and drink industry although the influence on the overall water use figure is low (3% total industry water use in 2010).</p> <p>Encourage registration to the Rippleffect programme.</p>

9.0 Data sources and methodology

9.1 Water data

The study aimed to collate sufficient water use data (public water supply from UK water companies and direct abstraction data from UK environmental regulators) to determine a total UK water use for the food and drink industry. Where actual data was not available, water use benchmarks and other data were used to extrapolate UK water use, and provide a breakdown of water use by sector (and sub-sector), and UK nation.

Data sources

- UK water company data (public water supply);
- UK environmental regulators (direct abstraction);
- sector and sub-sector water use studies;
- water use benchmarks; and
- other data: employment, production, and number of meals served.

9.2 2010 water use data

Where there is no actual 2010 data (i.e. water use benchmarks have been used), water use for 2010 is presented as a range with a 'low' and 'high' estimate. In reality, it is anticipated that the actual 2010 water use lies somewhere within the range presented.

Further information on the methodology used in this study can be found in the full report "Water use in the UK food and drink industry", available on the WRAP website.

Definition of water use

In the context of this study, water use is defined as water used in:

- the preparation of food and drink products; and
- employee water use.

Water used in other activities such as accommodation (e.g. hotels and hospitals), irrigation (e.g. sports facilities and landscaping) and customer use (retail and wholesale, sports facilities, guests/delegates at hotels or patient use in hospitals) has been excluded where possible because it does not relate to food and drink activities.

It has not been possible to calculate water used in the preparation/processing of food and drink products in the wholesale and retail sectors; however, it is likely that this will be minimal and limited to in-store delicatessens, fishmongers, bakeries, etc.

The definition of water use for each sector is summarised in Table 5.

Table 5: Water use as defined in this study

Food and drink sector	Water use definition	Comments and exclusions
<p>Manufacturing of food and drink products</p> 	<p>Two water use figures are calculated:</p> <ul style="list-style-type: none"> (i) total water use (including employee water use); and (ii) water use, excluding that in product 	<p>The water use, excluding that in product, aligns with the food and drink industry target (and FHC reporting), so a direct comparison can be made.</p> <p>Includes consumptive and non-consumptive water use.</p>
<p>Wholesale and retail</p> 	<p>Water used by the employee (washrooms)</p> <hr/> <p>Water used by the employee (washrooms)</p>	<p>It has not been possible to determine any water used in processing, although this is thought to be minimal.</p> <p>Water used by customers is not included.</p> <p>Consumptive water use.</p>
<p>Hospitality and food service</p> 	<p>The summation of two water use figures:</p> <ul style="list-style-type: none"> (i) water used in food preparation (based on number of meals and water use per meal type); and (ii) water used by the employee (to be consistent with the other categories). 	<p>Water used in accommodation (e.g. hotels and hospitals), irrigation (e.g. sports facilities and landscaping) and customer use (sports/leisure facilities and consumers) has been excluded since this is not relevant to food and drink activities.</p> <p>Consumptive water use.</p>

Glossary of terms

Standard industrial classification (SIC)

A recognised classification that provides a framework for the collection, tabulation, presentation and analysis of data, classifying business establishments and other statistical units by the type of economic activity in which they are engaged.

The Food Industry Sustainability Strategy (FISS)

This was drawn up in 2006 with the aid of stakeholders and sets out how all those involved in the UK food and drink industry beyond the farm gate (manufacturers, wholesalers, retailers and food service providers) can, through widespread adoption of best practice, help achieve sustainable development.

FISS estimated that the food and drink industry in England and Wales uses 252 million m³ water per year. Based on these findings, the FISS Water Champions Group recommended a food and drink industry water reduction target of 20% by the year 2020, against a 2007 baseline, which the Strategy considered to be achievable through the implementation of best practice in water use across the industry.

2010 low estimate

In general, the 'low' estimate reflects good practice and the assumption that it has been adopted throughout the sector means that this figure is likely to be an underestimate.

2010 high estimate

The 'high' 2010 estimate assumes that there has been no improvements in water management since 2007. The assumption that overall the sector has made no improvements since 2007 is not accurate and as such the water use figure represents a higher than expected value.

Water use excluding that in product

Water use excluding that in product' is defined as 'total water use' minus any water that is brought on to site (mains or direct abstraction) that is used as a raw material in the product. This is not the same as the water content of a product, since the latter excludes losses from any baking process but includes any water in the ingredients that are brought onto site already made up (e.g. syrups, sauces and fillings).

Water use (excluding that in product) is only significant in the manufacturing sector. Although there may be some water used in product in retail (in-store bakeries etc.) and in food preparation in the food service sector it was not possible to calculate this figure and as such has been omitted from the study.

Consumptive water use

Consumptive uses of water are conventionally regarded as those in which water is evaporated, incorporated into products, or consumed by humans, and hence not returned to the immediate environment.

WRMP

In 2007, each water company in England and Wales was required by the Environment Agency to publish information on water use by aggregated SIC code into Table WRP8 of their Water Resources Management Plan (WRMP) and so information for key components of the food and drink industry was available.

Food and drink manufacturing sub-sectors

Sub-sectors included in this study:

Food sub-sectors	Drink sub-sectors
Bakery	Soft drinks and beverages
Cereal products	Brewing
Confectionery	Distilling
Dairy	Wine
Animal feed	Cider
Fish processing	Maltings
Fruit and Vegetables	
Meat processing	
Milling	
Pet food	
Pre-prepared foods	

There were some manufacturing sub-sectors that were not included in this study because there were no data available. The key product categories not covered by the study include the manufacture of oils, fats, sugar, tea and coffee and account for 10% of total UK production in 2007 and 2010.

Meals, defined by food service type:

- restaurants;
- quick service retail (QSR)⁹;
- pubs;
- hotels;
- leisure;
- staff catering;
- health care;
- education; and
- services.

⁹ Outlets which may have takeaway or eat-in, or both, and where the customer generally pays when purchasing food or drink. Includes fast food, cafes, coffee shops, and takeaways.

Data tables

Table 6: Total water use, with breakdown by sector and nation, 2007, 2010 average, and high and low 2010 estimates

UK 2007	Total water use (million m ³ /year)				
	UK	England	Wales	Scotland	Northern Ireland
Food and drink manufacturing	230.9	133.3	9.4	78.3	9.9
Retail	10.1	8.3	0.5	1.0	0.4
Wholesale	1.6	1.4	0.1	0.1	0.1
Hospitality and food service	169.0	145.6	6.7	12.9	3.8
Total food and drink industry	411.7	288.6	16.7	92.2	14.1

UK 2010	Total water use (million m ³ /year)				
	Average	UK	England	Wales	Scotland
Food and drink manufacturing	190.6	125.5	7.2	51.0	6.9
Retail	8.5	7.1	0.4	0.8	0.3
Wholesale	1.4	1.2	0.1	0.1	0.0
Hospitality and food service	156.3	135.6	5.8	11.5	3.3
Total food and drink industry	356.8	269.3	13.6	63.3	10.6

UK 2010	Total water use (million m ³ /year)				
	low estimate	UK	England	Wales	Scotland
Food and drink manufacturing	185.5	121.3	7.0	50.5	6.6
Retail	6.9	5.7	0.4	0.6	0.2
Wholesale	1.1	1.0	0.0	0.1	0.0
Hospitality and food service	153.7	133.5	5.7	11.2	3.3
Total food and drink industry	347.3	261.5	13.1	62.5	10.2

UK 2010	Total water use (million m ³ /year)				
	high estimate	UK	England	Wales	Scotland
Food and drink manufacturing	195.7	129.7	7.5	51.4	7.2
Retail	10.1	8.4	0.5	0.9	0.3
Wholesale	1.7	1.4	0.1	0.1	0.1
Hospitality and food service	158.8	137.7	6.0	11.7	3.4
Total food and drink industry	366.4	277.2	14.0	64.2	11.0

Table 7: Total water use, with breakdown by sector

Food and drink industry	Total water use (million m ³ /year)			
	2007		2010	
Food and drink manufacturing	230.9	(56.1%)	185.5 - 195.7	(53.4%)
Retail	10.1	(2.5%)	6.9 – 10.1	(2.0 – 2.8%)
Wholesale	1.6	(0.4%)	1.1 – 1.7	(0.3 – 0.5%)
Hospitality and food service ¹	169.0	(41.1%)	153.7 – 158.8	(44.3% - 43.3%)
Total food and drink industry	411.7	(100%)	347.3 – 366.4	(100%)

Note: In this study, water use in the hospitality and food service comprises employee use and water use associated with food preparation.

Table 8: Manufacture of food, total water use, with breakdown by sub-sector

Manufacture of food	Total water use (million m ³ /year)		
	2007	2010 high	2010 low
Milling	0.4	0.4	0.4
Animal feed	1.2	1.2	1.2
Cereal products	2.7	2.6	2.0
Bakery	2.7	2.7	2.8
Confectionery	3.3	3.2	3.2
Pet food	3.7	4.1	4.3
Snack foods	4.5	4.5	3.4
Fish processing	5.7	5.0	4.3
Pre-prepared foods	10.4	11.7	9.4
Dairy	11.8	11.7	12.9
Fruit and Vegetables	27.8	19.3	19.3
Meat processing	39.8	41.5	36.1
UK Total	113.8	107.9	99.3

Table 9: Manufacture of drink, total water use, with breakdown by sub-sector

Manufacture of drink	Total water use (million m ³ /year)		
	2007	2010 high	2010 low
Wine	0.7	0.7	0.7
Cider	2.2	2.7	2.7
Maltings	5.5	5.2	5.2
Soft drinks and beverages	14.1	14.0	12.3
Brewing	24.6	20.4	20.4
Spirits	69.9	44.9	44.9
UK Total	117.0	87.9	86.2

Table 1: Water use in food wholesale and retail

Wholesale and Retail	Water use (million m ³ /year)		
	2007	2010 high estimate	2010 low estimate
Wholesale	1.6	1.7	1.1
Retail	10.1	10.1	6.9
Total	11.8	11.8	8.1

Table 2: Water use in hospitality and food service

Hospitality and food service	Water use (million m ³ /year)		
	2007	2010 high estimate	2010 low estimate
Employee component	17.9	16.3	11.1
Meals served component	151.2	142.5	142.5
Total	169.0	158.8	153.7

**Waste & Resources
Action Programme**

The Old Academy
21 Horse Fair
Banbury, Oxon
OX16 0AH

Tel: 01295 819 900
Fax: 01295 819 911
E-mail: info@wrap.org.uk

Helpline freephone
0808 100 2040

www.wrap.org.uk/water

