

The Federation House Commitment

Reducing water use within the Food & Drink Industry

Progress Report: 2010



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‘Progress made has been really impressive – a 5.6% reduction in water use since 2007.’



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Highlights

Dr Liz Goodwin,

WRAP (Waste & Resources Action Programme), Chief Executive Officer



What wonderful progress the Federation House Commitment (FHC) signatories have made – I hope everyone involved is proud of this achievement.

WRAP took over the responsibility for delivering the FHC from Envirowise following a review by the Department for Environment, Food and Rural Affairs (Defra) in 2009.

It was clear from day one that the signatories and the Food and Drink Federation (FDF) were absolutely committed to ensuring the success of this initiative. We were delighted to come on board to share our technical expertise and our experience of managing responsibility deals.

Over the past year, the progress made has been really impressive – a 5.6% reduction in water use, despite an increase in production of 4.2% by the 42 signatories involved.

Without doubt, there's still much work to be done to

achieve the industry target of 20% by 2020. However, I know this ambitious target is within our combined reach - a look at how far we've come since the initiative started in 2007 tells us that we can do it.

I hope WRAP's expertise will further add to the body of knowledge that already exists. For example, new signatories will benefit from a package of support including three days of on-site support from a technical water expert.

Additionally, they can access online tools, benchmarking information and case studies, and participate in peer working groups.

If you're not already a member company of the FHC, please pick up the phone or e-mail us and find out more.

We're looking forward to working closely with the FDF, existing FHC member companies and new signatories to continue making a difference. Together we can tackle the issue of water scarcity while delivering cost savings and reducing the carbon footprint of those involved.



Foreword



John Sutcliffe,

Chair of FDF's Sustainability Steering Group and Chief Executive of the Grocery Division of Associated British Foods

The food and drink manufacturing sector places water efficiency high on the agenda. Our sector is a significant user of water so management and conservation of this precious resource is a top environmental priority.

Industry, water suppliers and consumers all have a part to play in alleviating the stress on the nation's water supplies. Through the Federation House Commitment (FHC), launched jointly by the FDF and Envirowise, signatories contribute to an industry-wide target to reduce water use, outside that embedded in products, by 20% by 2020 compared to 2007.

The FHC is part of FDF's wider Five-Fold Environmental Ambition to make a significant contribution to improving the environment and thereby ensuring sustainable food production for the future.

With 29 FDF member companies already participating in the FHC we are delighted that tremendous progress has been made towards the 2020 target in the first two years alone. We hope this encourages other companies to realise the potential savings and considerable benefits of efficient water management.



Richard Benyon,

Minister for Natural Environment

I welcome this report on the Federation House Commitment (FHC) and the encouraging progress being made in its work to promote water conservation amongst its members in the food and drink sector. Water conservation is not simply a matter for those regions of the world that suffer from shortage due to their inherent climatic conditions, but has a crucial importance for many areas of the UK that are affected by constant change in the level of water available due to uncertain weather patterns, and their own unique geology, as well as changing patterns of usage. Conserving water can also impact on other environmental indicators in a significant way – by reducing the amount of water requiring heating for commercial purposes, it is also possible to reduce energy usage and carbon emissions.

For businesses facing a difficult economic climate it is also a way of saving costs and improving efficiency. This is where the environment and the economy come together, a relationship we have noted in the Defra Structural Reform Plan, where our commitments to encourage sustainable food production, enhance the

environment and support a strong and sustainable green economy sit closely together.

The FHC is a good example of what this Government means when it talks about the 'Big Society' – organisations and citizens outside of official structures, playing a role in achieving goals that benefit the community and country as a whole. The work of WRAP (Waste & Resources Action Programme) and, previously, Envirowise, in bringing the various members together to help them achieve this common goal is also an example of where Government action can effectively help and promote successful Big Society intervention – it is part of what is meant when we talk of this being the greenest Government yet.

I wish the members of the FHC every success in their continuing efforts.

Introduction

The Federation House Commitment (FHC) is an initiative jointly developed by the Food and Drink Federation (FDF) and Envirowise, providing companies with a systematic approach for improving water efficiency. The Commitment was launched in January 2008 as part of the FDF's Five-Fold Environmental Ambition¹.

Following Defra's Delivery Landscape Review in 2009, work previously carried out by other resource efficiency delivery bodies, including Envirowise, has been integrated into the role of WRAP (Waste & Resources Action Programme). As a result, WRAP is now responsible for delivering the FHC, working closely with the FDF. WRAP has appointed Hyder Consulting to manage the Commitment and to provide technical expertise on water efficiency within the food and drink sector.

The FHC is open to all companies in the food and drink manufacturing sector and is helping the industry to become a leader nationally in improving water efficiency. The aim is to help reduce stress on the nation's water supplies and contribute to an industry-wide target to reduce water use (excluding that embedded in products) by 20% by 2020 against a 2007 baseline. This target was set as part of the joint industry and Defra's Food Industry Sustainability Strategy (FISS).

Under the FHC, food and drink companies pledge to review their individual on-site water use and take action to reduce it.

The key elements of the Commitment are:

- development of a 2007 baseline of water use for individual signatories and for the Commitment as a whole;
- assessment of water use at each participating company's manufacturing sites;
- the development of site-specific action plans to reduce water use;
- implementation of action plans; and
- annual reporting to WRAP on water and cost savings.

The FHC has now been running for two years, turning the commitments made by member companies into real, tangible water savings across the food and drink sector. This is the second FHC Annual Progress Report². It shares the collective progress its members are making and highlights some of the measures individual companies have adopted to reduce their water use at UK manufacturing sites.

¹ FDF's Five-Fold Environmental Ambition was launched in October 2007 and is a commitment on behalf of member companies to make a significant contribution to improving the environment by targeting those areas where they could make the biggest difference (www.fdf.org.uk)

² The first Progress Report is available at www.fhc2020.co.uk

Why the FHC?

The food and drink sector is a major water user, both from direct abstraction and its use of the public water supply. According to the FISS, the food industry in England and Wales is estimated to use 430 mega litres per day (equivalent to 156,950,000m³ per year) from the public water supply (10% of industrial use). It is also estimated to make direct abstractions of 260 mega litres of water per day (94,900,000m³ per year)³.

The overall water reduction target of 20% by 2020 against a 2007 baseline (excluding water embedded within products), as set out in the FISS, is considered to be feasible by implementing water use best practices across the industry. The FHC provides an avenue to help the industry to achieve the FISS targets.

In addition to the 20% target signatories have committed to contributing to achieve, many FHC members have also set even more challenging targets to drive down water use and achieve their individual sustainability goals.

While the FHC and this Report are specific to the food and drink sector, other businesses can benefit from improving their water efficiency. Companies can contact WRAP for free expert advice by visiting www.wrap.org.uk or calling the Resource Efficiency Helpline on 0808 100 2040.

³ Food and Drink Industry Sustainability Strategy, 2006, www.defra.gov.uk

Why sign up?

By signing up to the FHC, companies within the food and drink sector are reaping the benefits from improved water efficiency and financial savings, whilst contributing to the overall industry-wide target to reduce water use.

Demonstrating leadership. Through their public commitment to reducing water usage, companies that sign up to the FHC are demonstrating real leadership within the sector.

Improving the bottom line. Good environmental practice has shown that a company can save around 30% on its water and effluent bills by putting simple or relatively low cost measures in place. Since water needs to be treated before and after use, the costs of the associated energy and materials can also be reduced along with the carbon footprint.

Gaining a competitive edge. It is becoming increasingly important for both business-to-business and consumer-focused companies to address their stakeholder requirements. Today's businesses and consumers are increasingly aware of the impact they are imposing on the environment, and are subsequently attracted to companies that are addressing this. By joining the FHC, companies demonstrate a real commitment to reducing the impact of the water they use.

Water availability. Over-abstraction, climate change, population growth and economic development all have an effect on water availability. In water stressed conditions, water shortages could affect operations. Companies that are addressing their water usage will be better prepared for any potential disruption to the water supply in the future.

Over the last year the FHC has continued to grow with a further seven companies making the public commitment to reduce their water use. The FHC now has 42 signatories who are engaged in making on-site improvements to reduce their water use. A full list of participants is provided on page 32 of this Report.

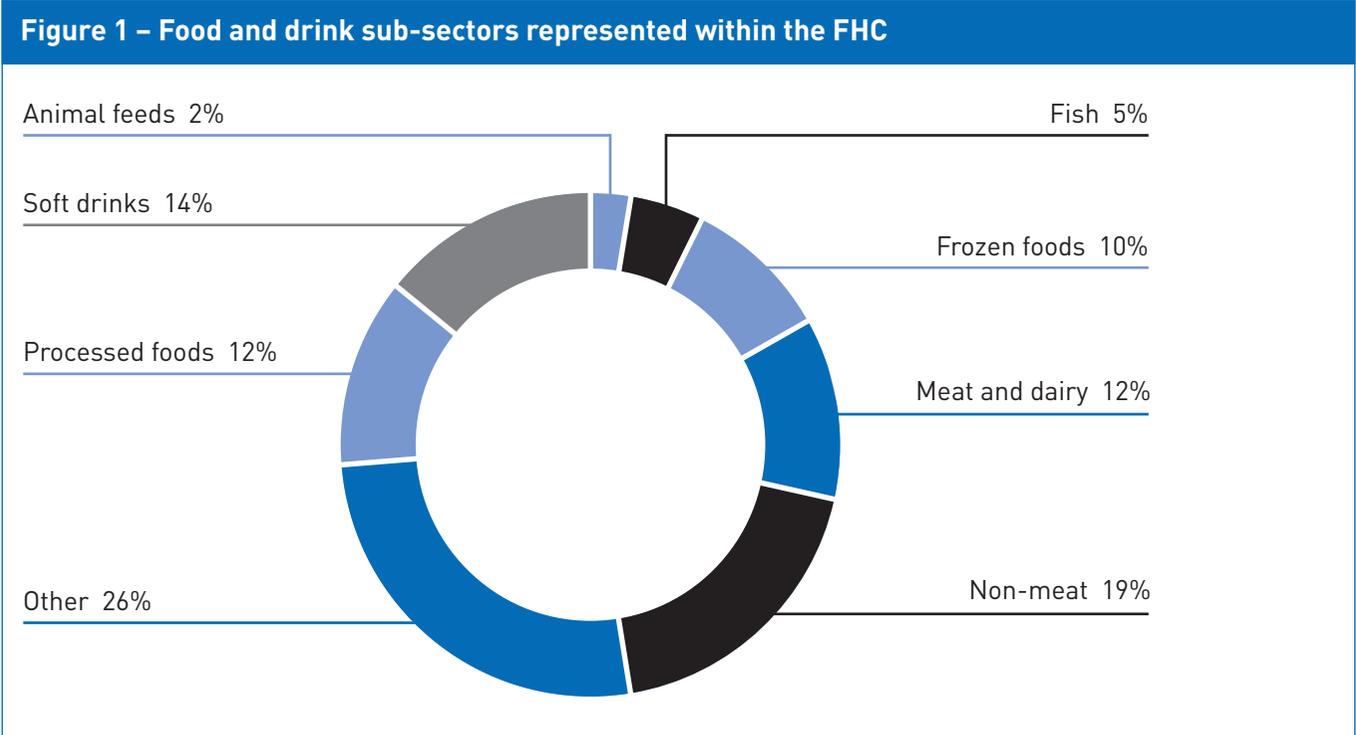
The signatories who joined during 2009 are:

- Framptons;
- Freshtime;
- General Mills;
- Natures Way Foods;
- Northumberland Cheese Company;
- Pataks (AB World Foods); and
- Paterson Arran Ltd.

WRAP will continue to work with each of these new and existing signatories to help them identify, develop and implement water saving initiatives at their manufacturing sites.

A wide variety of manufacturing operations, across a range of sub-sectors within the food and drink sector, are represented within the FHC. Figure 1 provides a breakdown of the signatories by sub-sector. Of the 42 signatories, 43% are from the processed food, non-meat and meat and dairy sectors, with 26% classifying themselves as from sub-sectors other than those listed, truly demonstrating the diversity within the FHC and the opportunity for transfer of best practice and knowledge sharing between signatories.

Total water use data provided from the 42 signatories for 2007 (calculated from 204 sites) is 44,951,827m³ (this includes water embedded in products), representing approximately 18% of the total sector water use when compared to sector water use reported in the FISS. This comprises 34,296,909m³ from the public water supply (approximately 22% of that reported in the FISS) and 10,317,220m³ from direct abstraction (approximately 11% of that reported in the FISS).



Progress to date

As we move towards a more sustainable, low-carbon future it is clear that good environmental practice also makes excellent business sense. The efficient use of resources can contribute directly to reducing costs and increasing the efficiency of our process operations. The benefits that accrue from making a real difference to the environment are doubly important at a time when the economy remains under pressure.

In this context, and set against increased output and growth of the sector as a whole, over the last two years FHC signatories have made continued progress in reducing their water use.



To maintain individual company data confidentiality, water usage data is aggregated and reported on a collective basis. In order to determine progress on a like-for-like basis, during the first two years of the FHC only data provided from signatory sites (190 sites) for both 2007 (baseline year) and 2009 have been considered in this analysis.

From the data provided, total water use (excluding that embedded in products) by FHC signatories in 2009 has reduced by 5.6% from 36,559,054m³ to 34,500,091m³, equating to a saving of more than 2,060,000m³ against the 2007 baseline.

When considering total water consumed per tonne of product manufactured, it is clear that this reduction correlates to actual water savings rather than variations in production rates. Since 2007 production by FHC signatories has increased by 4.2% and water used (not embedded in products) per tonne of product has decreased from 2.48m³/tonne of product to 2.24m³/tonne of product, a reduction of 9.4% against the 2007 baseline.

	Total water used (excluding that embedded in products) (m ³) ⁴	% decrease
2007 ⁵	36,559,054	
2009	34,500,091	5.6

	Total water used (excluding that embedded in products) (m ³ /tonne of product) ⁶	% decrease
2007 ⁷	2.48	
2009	2.24	9.4

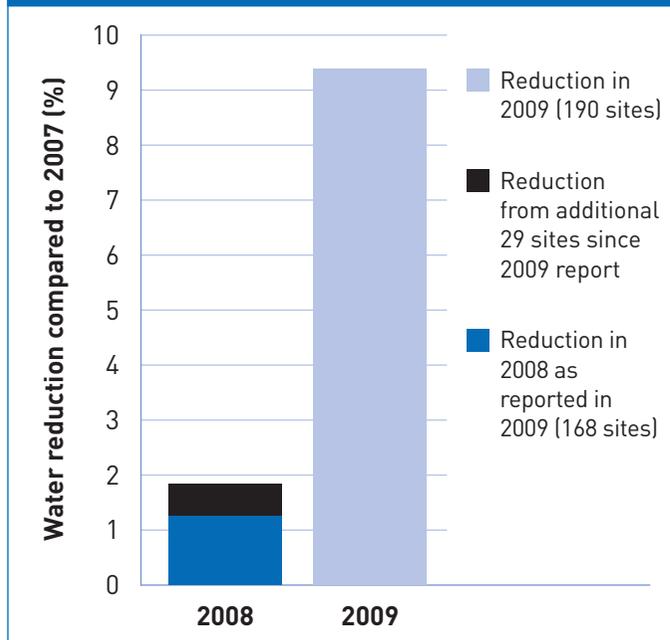
4 & 6 Based on comparable 2007 and 2009 datasets from 190 sites

5 & 7 The 2007 baseline is not static; it will increase as more sites contribute data. The 2007 baseline is derived from the sites that also provide the corresponding comparison year's data

Figure 2 demonstrates the annual progress achieved by FHC signatories. In 2008, total water used (not embedded in products) per tonne of product decreased by 1.4% compared to the 2007 baseline⁸. This was reduced further in 2009 to 9.4% against the baseline, calculated from water use data for 2009 provided by 190 sites. However, a small proportion of savings were

⁸ As previously reported in the 2009 Progress Report (168 sites)

Figure 2 – Annual progress of FHC membership



made in 2008 but not reported at that time (data from 29 sites). In total, 117 sites have reduced their water consumption per tonne of product since 2007.

The collective progress of FHC signatories over the last two years has been encouraging and indicates that the FHC is making a significant contribution to the 20% reduction target (against the 2007 baseline) by 2020, particularly as some of the actions under consideration have the potential to save large quantities of water.

In addition to the significant water savings that have been achieved, further environmental benefits including savings in energy, raw materials and associated carbon impacts will also have been realised. Assuming all water savings are from the public water supply and an average cost of £1.18/m³ of water is applied, savings of around £2.5 million in the purchase of water alone will have been achieved. Further cost savings can be expected through changes in water treatment, effluent disposal and raw materials.

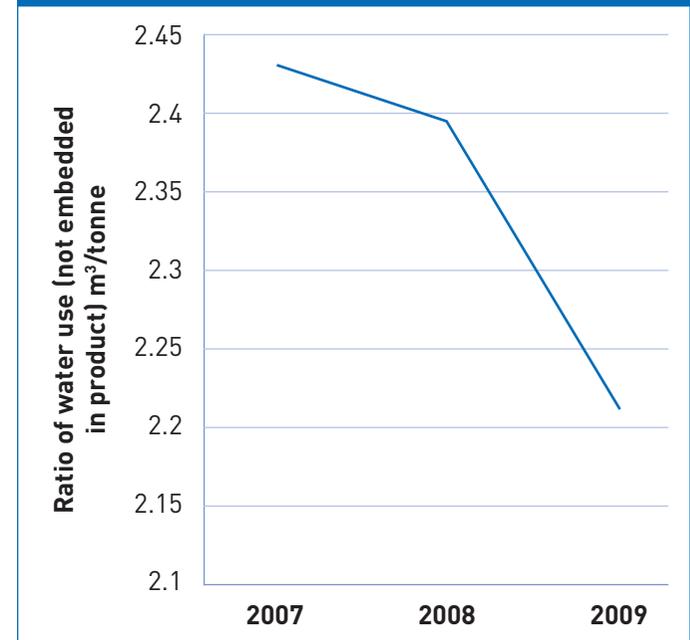
FHC water reduction trend

To determine the year-on-year trend since 2007, a like-for-like comparison of the water use data provided from signatory sites (186 sites) for 2007, 2008 and 2009 was considered. Figure 3 shows the volume of water (not embedded in products) as m³ consumed

per tonne of product for this period. Since this dataset is a subset of the data utilised to derive the benchmark figures for 2007 and 2009 there is a small degree of variation to the figures reported.

The graph in Figure 3 demonstrates that FHC signatories have continued to make good progress, which was accelerated in 2009.

Figure 3 – FHC water reduction trend



The acceleration of progress in 2009 clearly demonstrates the FHC signatories' commitment to reduce their water consumption. A total of 117 sites within the FHC have achieved a reduction in on-site water use since 2007, while many are still in the early stages of implementing water saving initiatives. Some sites have already made significant savings and a number of these are illustrated in the case study examples throughout this report.

Signatories signing up to the FHC pledge to follow five steps to progress:

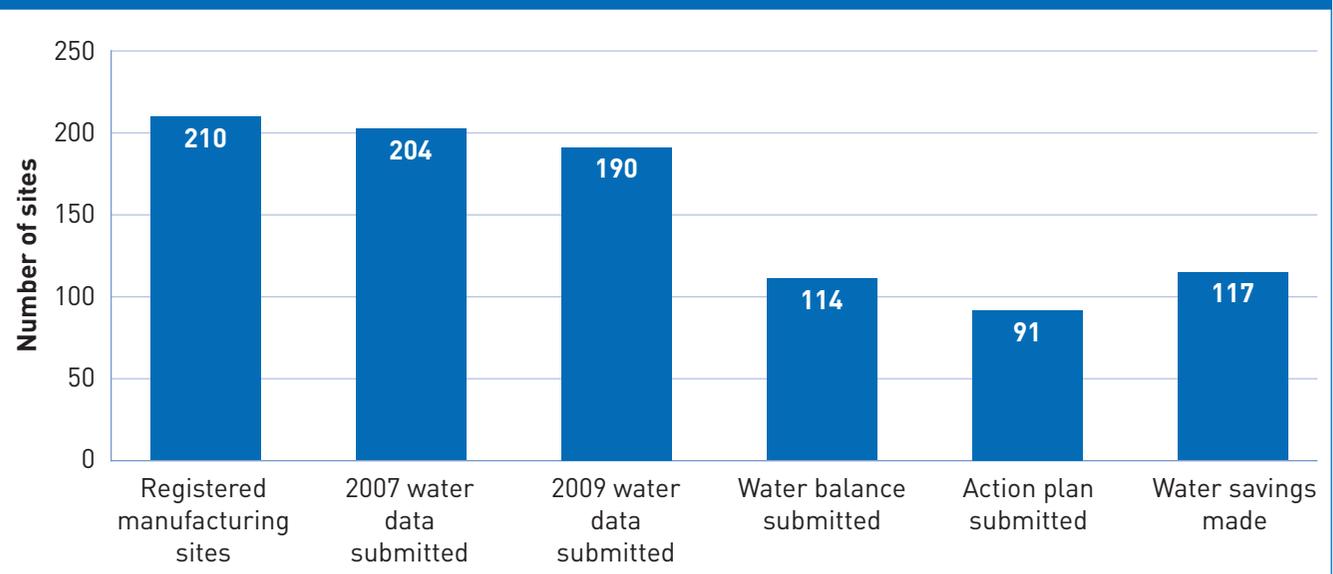
- Step 1 – Develop a 2007 water use baseline.
- Step 2 – Assess water use at each manufacturing site by mapping water use and preparing a water mass balance.
- Step 3 – Develop a site-specific action plan.
- Step 4 – Implement the actions identified.
- Step 5 – Report annual water and cost savings.

Sites that are well advanced in the process have progressed onto programmes of work that require capital investment. Some of these longer-term actions require significant changes to operational processes and time is required for investigation and planning. As such, some of the actions being taken forward now will not necessarily result in savings in the short term.

Other sites remain in the early stages of progress and are, for example, learning the benefits of preparing a water mass balance and undertaking staff awareness raising campaigns on water efficiency.

Going forward, greater savings can be expected as more sites identify and implement water saving initiatives and some of the longer-term actions start to provide a return. Similarly, time is required for multi-site organisations to share the learning from exemplar sites across others within the company. A summary of the number of sites at each stage of the process is shown in Figure 4. To drive progress further, from summer 2010 new and existing signatories will be offered up to three days of on-site technical support to develop water mass balances and to develop and implement water action plans.

Figure 4 – Site data submission and progress



The 42 signatories have collectively registered 210 manufacturing sites within the FHC. Since 2007 9 of these sites have closed. A site may have closed because production has ceased or been relocated. Production may relocate to another site within the same organisation or the site itself may be divested to an organisation outside of the FHC.

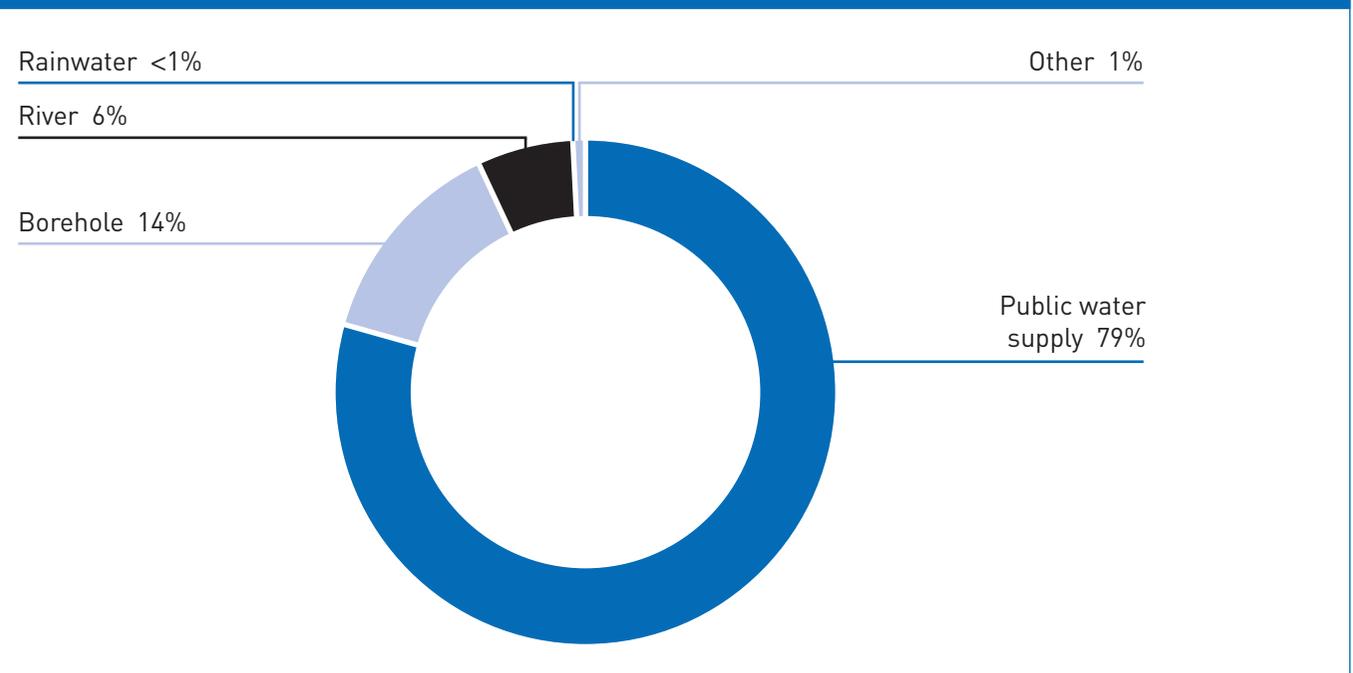
All sites are required to work through each stage of the FHC, but multi-site companies may start with just one site and introduce others to the process on an ongoing basis, thus enabling best practice to be shared across a company.



Sources of processing water

From the data provided, it is clear that most signatories are drawing on the public water supply. However, some of the water being used for processing is abstracted from other sources, such as groundwater (borehole) and surface water (river). Figure 5 illustrates where water is currently being sourced within the FHC signatories' sites.

Figure 5 – Water sources used in 2009 by the FHC signatories



Water efficiency action

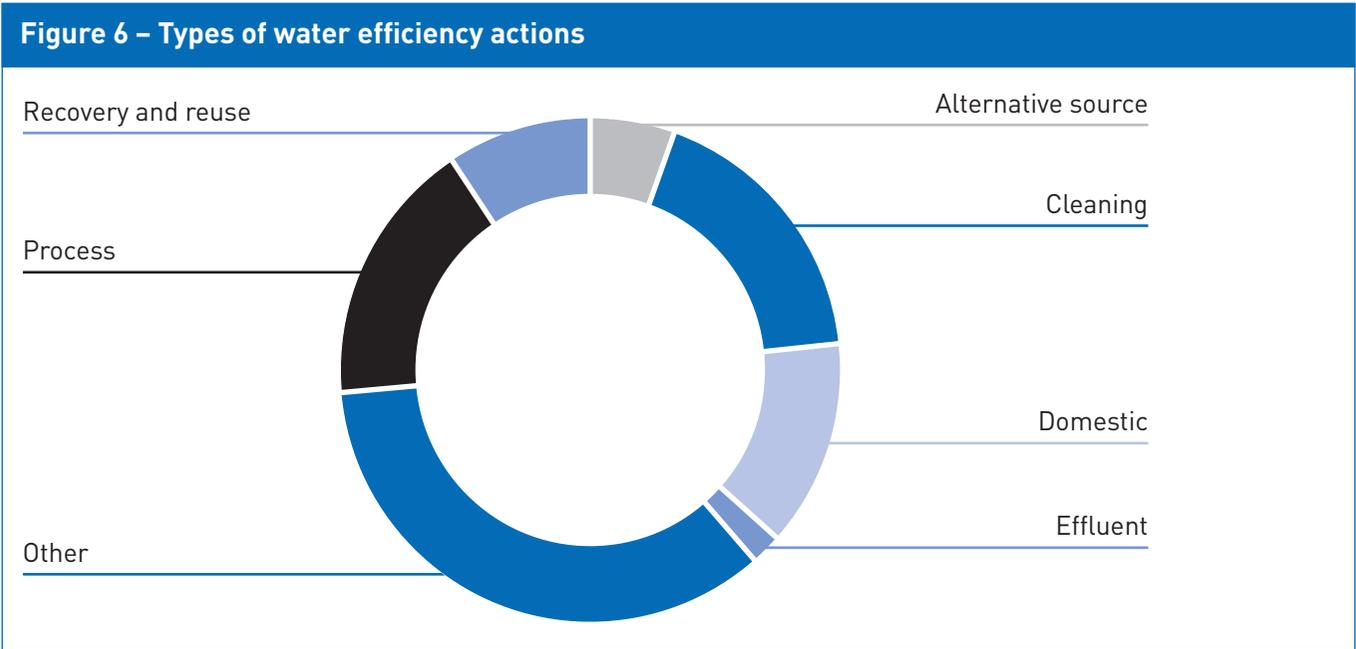
Developing an action plan enables manufacturing sites to assess environmental performance, prioritise actions and set targets to:

- identify and implement achievable savings within specified timescales;
- motivate and delegate responsibilities to employees; and
- encourage water reduction programmes to maintain momentum.

Site actions have been categorised to identify trends within the sector. Currently, many of the water efficiency actions being explored are associated with cleaning, are process related, and address domestic water use (see Figure 6).

Examples of some of the types of actions within each category are discussed below.

Alternative water source – Rainwater harvesting is the most common alternative water source considered and can be an effective way to cut back on mains water usage and reduce costs. Collection and storage of rainwater can provide supply for non-production parts of the site, such as toilet flushing and cooling water, particularly as the ‘soft’ nature of the water means lime-scale deposit can be reduced. Storing rainwater may also help to prevent local flooding.



Cleaning – Some of the major water uses within the food and drink sector are for cleaning procedures. Cleaning is vital for food safety but can account for up to 70% of a company’s water usage particularly when a ‘better safe than sorry’ approach to cleaning is adopted. Reducing water use for cleaning without compromising hygiene standards is possible. Examples of water saving actions in this category include: cleaning in place (CIP), pigging (product recovery) and transferring to dry cleaning operations.

Effluent treatment – Effluent is usually treated to reduce its strength and discharge costs. Effluent treatment tends to be a longer-term consideration requiring capital investment for the installation of a treatment plant and equipment.

Recovery and reuse – Water efficiency actions within this category typically include the recycling of condensate for boiler feed and the installation of recirculation systems.

Domestic – Water saving actions typically involve replacing taps, fitting more water efficient toilets and urinals, and reducing water use in site canteens. Actions of this nature are usually simple, low cost solutions with quick payback periods.

Process – Characteristically, process-related actions focus on the efficiency of the equipment used during processing. For example, the optimisation of spray bar function, the replacement of faulty solenoid valves and the balancing of water circulation systems.

Other – Not categorised above, these actions can cover a range of different initiatives, including:

- the installation of sub-metering; this is often a requirement if there is an area that needs to be investigated in more detail, either to improve water mapping or to monitor areas of high water usage. The water balance is used to highlight whether this is necessary; and
- education of staff; running a water awareness campaign can be beneficial in terms of helping staff to understand how they can reduce water use and help the company reach its water efficiency targets.

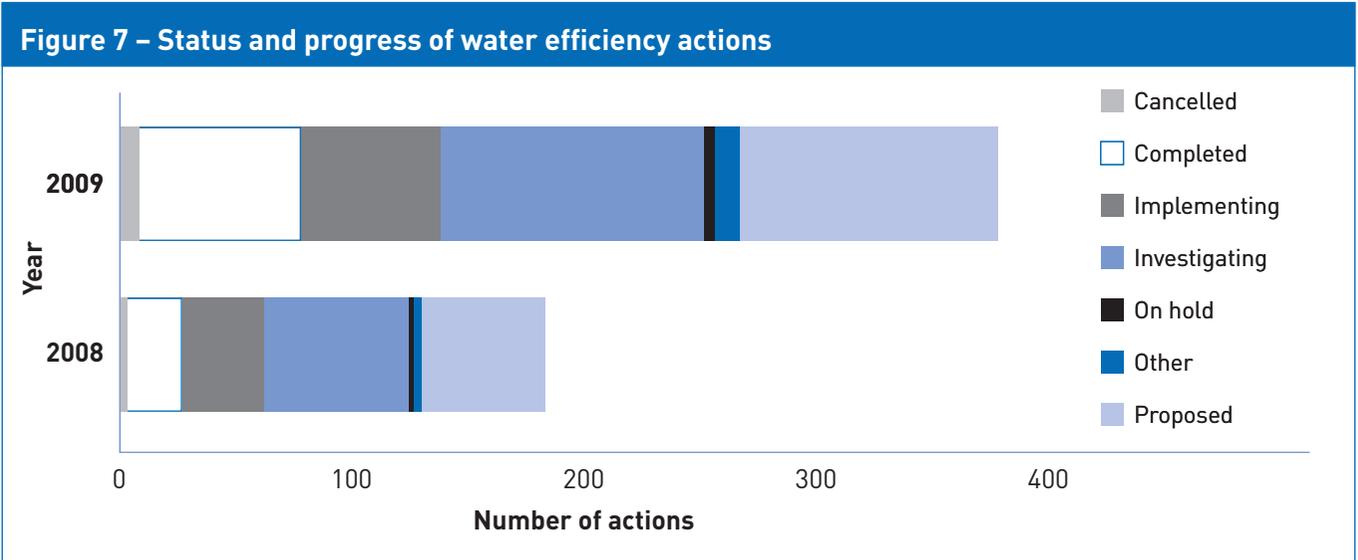
Water saving initiatives range from low cost and easy to implement solutions through to those that require capital investment with longer lead in times, allowing for investigation and planning. As such, some of the actions being taken forward will not necessarily result in immediate savings. Financial support is available to businesses investing in water saving products, such as CIP, through the Water Technology List⁹.

Within the FHC a site can indicate the progress of each of the water saving actions it is considering implementing. Figure 7 indicates the status of the actions recorded.

⁹ www.businesslink.gov.uk/wtl

Of the actions recorded with the FHC, 18% have been completed and 45% are either in the process of being investigated or implemented. Only 3% have been cancelled or are currently on hold, mostly because they are no longer relevant to the situation on site.

Some of the actions that companies can take to improve water efficiency are highlighted in the accompanying case studies.



Actions and case studies

Building teams and involving staff

When introducing a water efficiency programme it is important that everyone in the company is involved, to ensure it is successfully integrated into the company culture. Senior management need to be committed to the programme, but for it to succeed everyone in the company needs to support it, and one of the ways to do this is to ensure ownership. The key point is to harness the powerful motivator 'involvement creates ownership'.

Initially the most effective way of achieving involvement is to recruit teams to carry out specific projects. Teams can be used to:

- carry out surveys to identify problem areas;
- brainstorm particular problems to develop solutions;
- select the most feasible ideas; and
- implement the selected opportunities.

Ideally, teams should be cross-functional; people with different roles and experiences will bring different skills and ideas, and will ensure a wider buy-in to the programme. This is particularly helpful if reducing water in one area of the company requires action from staff in other areas. Typically, small teams of four to eight people work well when instigating data surveys and reviewing ideas. Going forward the team structure should not remain static, and teams will tend to grow as opportunities are identified. As teams grow larger they may need to split into a number of specific project or implementation teams.

Team working will also lead to the identification of ongoing opportunities for cost savings.

At first people may be reluctant to provide ideas so it is important to have clear and encouraging communications that:

- explain the project;
- ask for input;
- explain how decisions will be made and be open about why some ideas are to be implemented and others are not;
- involve a variety of people in the discussions;
- communicate progress; and
- give ownership to people who can make a difference.

apetito has found team working and complete company involvement especially beneficial, as shown in the following case study.



Case study **apetito**



‘The financial benefits of undertaking a water efficiency programme are strong, but the buzz of being ‘an environmental achiever’ gives the business so much more. Once we got the ball rolling and the whole team got involved, the savings really began to materialise.’

Mark Lovett, Safety and Sustainability Manager, **apetito**



apetito, a £90m turnover frozen meals manufacturer based in Trowbridge, Wiltshire, was a founder signatory of the Federation House Commitment and since 2007 has been working on a water efficiency programme at its main factory site.

Mark Lovett, **apetito**’s Safety and Sustainability Manager, commented, ‘Our response to the FHC naturally fits into our wider corporate sustainability agenda, and saving water is very much part of our resource efficiency policy.’

The company moved forward on a water saving programme by forming a lead team and involving the entire workforce. Good data management was found to be central to the programme. Weekly meter

readings were collected for each production area and the trends analysed.

Key actions included:

- regular surveys to identify and rectify leaks;
- addressing the obvious: turning off taps, reducing flow rates, investigating alternative cleaning procedures;
- water reduction policy, sharing it with all work groups;
- water saving features in the design of refit and factory upgrade;
- switching from high pressure to low pressure water ring main;

- replacing open hoses with high velocity low volume trigger release nozzles; and
- keep on looking for savings.

With rising commercial water supply and disposal costs, the savings represent a real contribution to maintaining business success.

Using water balances and water use trends

Developing a water balance helps a business to understand and manage water efficiently, identify areas with greatest cost saving potential and detect leaks.

The main benefits of using a water balance to identify and implement opportunities to reduce water use are:

- reductions in:
 - water supply costs;
 - water treatment and effluent treatment costs;
 - effluent and sewerage disposal costs;
 - wasted raw materials or products; and
 - management and handling costs;
- improved environmental management;
- better compliance and relations with environmental regulators; and
- greater employee awareness of water efficiency issues.

A water balance helps the development of an effective water minimisation project, especially when used to highlight the key processing areas on which to target, for example, those with high water use and those that use high value water.

Monitoring water use on a regular basis can help to track trends in its usage. Analysing water usage trends can highlight any changes that may not otherwise have

been identified until the next water bill is received. The information can also be used to communicate progress to management as well as the wider company.

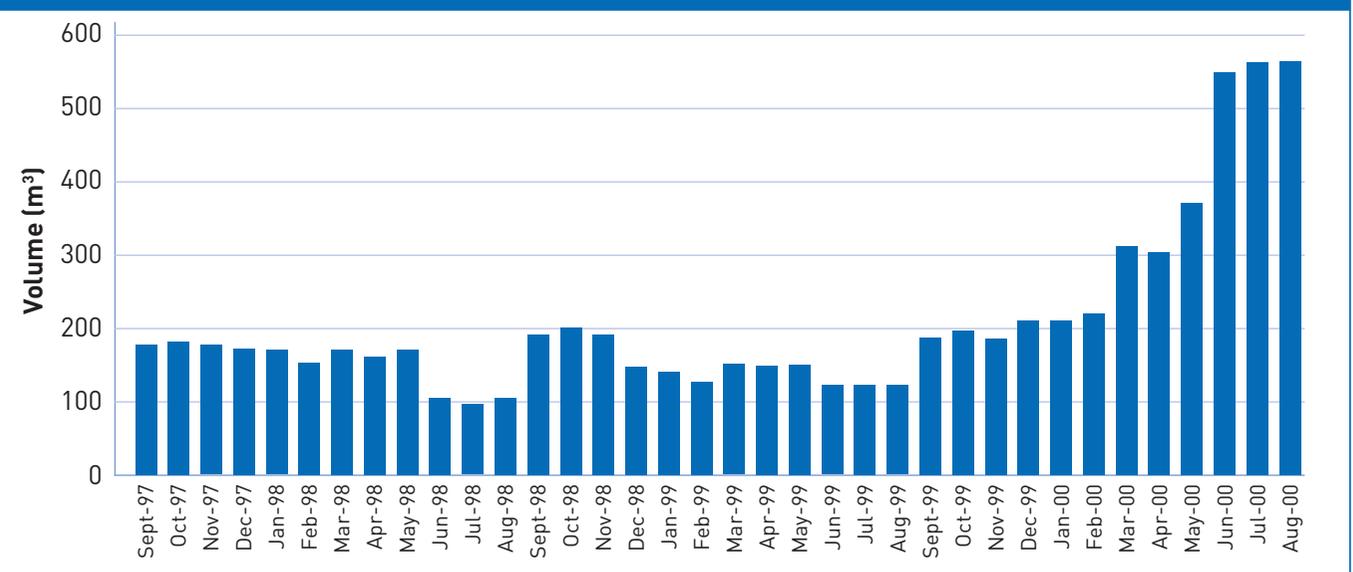
The example graph below shows a marked increase in water use in summer 2000; in this particular example it was caused by a broken underground pipe. Without regular monitoring this may not have been noticed.

A Water Monitoring Tool is available from <http://envirowise.wrap.org.uk/WaterTools> and can help a business to record and understand where, and when, water is being used on company premises.

Based on three Microsoft® Excel spreadsheets, a business can download and populate the spreadsheet which reflects the frequency of meter readings taken on site. The water meter readings are entered on to the spreadsheet, which is set up to calculate water consumption and generate graphs to illustrate trends in water usage. Summaries of water usage can be viewed on a weekly, monthly or annual basis.

Coca-Cola Enterprises monitors its water use closely to track how much water is being used at each of its production stages to identify areas on which to focus attention, as shown in the following case study.

Figure 8 – Sample water monitoring graph



Case study Coca-Cola Enterprises



‘Coca-Cola Enterprises is already trying to minimise the environmental impact of its operations. We have already made significant progress in reducing the amount of waste water from our production process by 41% since 2001. We are proud to be supporting the industry best practice commitment on water, through which we will reduce this amount further, and which supports our efforts to use water in a responsible and sustainable way.’

Simon Baldry, VP & Regional General Manager, CCE Great Britain

Sidcup factory installed a monitoring and targeting system to help evaluate utilities usage across the site. The system includes a number of water meters, which were installed at key locations to help analyse water usage at various stages of the manufacturing process.

The meters are connected via a network to a software analysis tool, which enables accurate data monitoring and analysis. The site is now able to track water usage for each production line, as well as for each of the manufacturing services. This has enabled us to identify areas of opportunity, as well as provide daily tracking of water usage, to enable immediate identification and correction of any problem areas.

The team at Sidcup has also extended the monitoring further and has installed a range of manual meters to help measure the water usage in more detail within the canning production line. The metering tools have helped the site to target areas for improvement, and to measure the impact of any changes.

There are three examples of where the system has proved invaluable:

- A major water leak was identified through a mass balance exercise comparing the incoming water supply to the sum of the individual meters. The water saving was more than 500m³ per week.

- The detailed metering helped to highlight the significant water usage on the canning line container rinser. The site launched a project to make various improvements, including replacing the water nozzles with a more efficient version, resulting in halving of water use in this process.
- The system helped to quantify the significant water being used by deaerator pumps. A new type of sealed pump was introduced, saving the site more than 250m³ per week.

As a result of these and other improvements, the Sidcup team has reduced the amount of wasted water by 15% in the past 12 months, and has plans to make further improvements in the future.

Development of an action plan

To achieve the most from a water minimisation project, an action plan is essential. The plan ensures the most beneficial activities are implemented in the most efficient order for a business. It should motivate employees to be part of the project and help to maintain momentum.

To develop a robust action plan, it is essential to have undertaken a site water balance to understand where the business uses water, how much and its quality and temperature. The collected data can then be used to identify potential areas for reducing water use and effluent generation.

Simple methods such as Pareto analysis¹⁰ can help to build an action plan. It can be used to analyse data to understand which areas using water generate the highest costs. These may be the areas on which a company chooses to focus attention. Using a scorecard (or decision matrix) helps to select actions that will give 'quick wins' and scores each water efficiency action against factors such as potential savings, capital cost and barriers to implementation. This helps to identify and prioritise actions so that the best savings can be achieved with the least effort.



An action plan should consist of the following basic elements:

- each action and task;
- the achievable benefit in terms of water and cost savings;
- the team member responsible for undertaking the task; and
- the timescale for completion.

¹⁰ Pareto analysis is an effective technique to show where to target corrective actions and is based on the principle that 80% of the effects are due to 20% of the causes

Figure 9 – An example action plan¹¹

Company	Meat Products Limited				
Prepared by	J Smith	Position	Environmental Manager	Date	01/01/2009
Action ref	Action description	Benefit		Staff member responsible	Target date for completion
1	Provide bins for staff to dispose of offcuts	Waste no longer discharges to drain (reduced effluent loads) Use dry cleaning methods on floors (less water use)		Operations Manager	01/02/2009
2	Lock hoses so that only authorised staff can use them	Reduced water used in floor cleaning		Operations Manager	01/02/2009
3	Fit drain covers to capture solids and empty before cleaning	Reduced solids loading on effluent treatment plant		Operations Manager	01/03/2009
4	Collect meat offcuts and trimmings from equipment – fit trays to capture waste	Waste no longer discharged to drain (reduced effluent loads) Use dry cleaning methods on floors (less water use)		Engineering Manager	01/04/2009
5	Provide staff training to raise awareness of new procedures	Ensures success of new initiatives		Environmental Manager	01/05/2009
Reviewed by	J Smith	Position	Environmental Manager	Date	01/01/2009
Approved by	S Khan	Position	Site Director	Date	01/01/2009
Document reference	AP2009	Version No.	R1	Location	EHS Office
Next review	01/04/2009 (quarterly review)				

It is important to review the plan on a regular basis to ensure actions are being implemented, the expected savings are being made, and to ensure continual improvement can be realised.

11 EN934 Developing an action plan to reduce water usage: five simple steps, 2009, Envirowise



Case study Premier Foods

'In these challenging economic times, reducing water usage is not only socially and environmentally responsible, but also makes very good financial sense. Premier Foods, as a major UK food manufacturer, is heavily reliant upon guaranteed supplies of high quality water for the majority of its operations. Premier Foods recognises water as a valuable resource, and is committed to managing water efficiently. Continued membership of the FHC has been instrumental in helping Premier Foods achieve its 2009 water reduction targets.'

Ewan Miller, Engineering Projects Manager, Premier Foods

In working towards its FHC 2020 pledge, Premier Foods set a 2009 group-wide non-ingredient water (NIW) usage reduction target of 5%.

In 2008, the transfer of production from its Droylesden and Ledbury sites to Premier Foods' Histon Preserves and Desserts facility, caused water usage on that site to spiral. By July 2009, NIW usage per tonne of output (m³/t) had increased by 6.3%.

Realising that water usage on site was in danger of getting out of control, the site management decided to take positive action. A cross-functional Water Reduction Team was established, which was formed from representatives from all production and engineering departments.

Team members were challenged to fully understand the scale and nature of water usage throughout their respective areas and activities, to identify the most significant uses, and to propose suitable solutions to reduce water use. The team was aware at the outset that all proposals should incur minimal expenditure or have a justifiable financial payback. Initiatives ranged from fixing leaks, limiting the use of hoses, changing cleaning methods (wet to dry) and optimising production schedules, to the feasibility of installing a new reverse osmosis plant.

To complement these practical solutions, a site-wide education and information programme was implemented to ensure that the workforce was kept

fully aware of, and engaged with, the challenge, progress and achievements.

Of the 178 water saving initiatives identified in 2009, 55% were completed by January 2010, resulting in monthly NIW usage falling from a peak of 4.4m³/tonne in June 2009 to 3.25m³/tonne in December 2009. This was a reduction in water usage of 1400m³/week, a 16% decrease from June to December.

The remaining initiatives, once realised, are expected to deliver further savings of around 40,000m³ per year.

The team will continue its good work in 2010 and fully expects to deliver the predicted savings.

Benchmarking your water use

Benchmarking can help you understand your water efficiency performance. It can be used to gauge your company's performance as compared to other companies in your industry (see the Water Account Tool¹² at <http://enviowise.wrap.org.uk/WaterTools>). It can also help to identify processes that can be adopted to reduce water use and cut costs.

Benchmarking can be particularly valuable when comparing water use at sites within your own company, but is most useful for sites that undertake similar production activities. It will help to identify those sites implementing good water management practices. Understanding why some sites perform better than others means that the good practices at one site can be shared with others and thereby help to improve overall company performance.

Benchmarking water use at a particular production site can also be useful for revealing water saving opportunities. For example, you could compare water use between different production shifts or production lines. This could highlight, for example, where different cleaning techniques are being used, or where equipment requires maintenance.

An important element in benchmarking is the identification and use of key performance indicators (KPIs). KPIs are factors you can use to measure the success of your business through achieving targets. For manufacturing sites, it is important to ensure water data accounts for varying production levels so that only the difference in water use is highlighted. Hence, KPIs such as water use (m³) per tonne of product, and water use (m³) per m³ of product are most commonly used. When monitoring domestic water usage in washrooms and canteens, water use (m³) per employee will be more appropriate.

Using benchmarking to improve your business' water efficiency can often be achieved at relatively low cost, but it can deliver significant benefits.

Burton's Foods demonstrates the usefulness of benchmarking for identifying unexpected water use on site.



¹² The Water Account Tool is a benchmarking tool. It enables a business to compare its water consumption with that of other companies in its sub-sector. This helps a business to gauge its performance relative to its industry average. The business selects its sector and the unit of measure (for example, m³ per employee or m³ per tonne of product) and then enters its own data. A graph is subsequently displayed showing all datasets (anonymised), including that of the business, plotted as a red line. A table summarising the benchmarks for the chosen sector is also displayed. It provides minimum water use (indicative of good performance), average water use and maximum water use (indicative of poor performance). It also details the number of datasets used in the calculation



Case study Burton's Foods

'We fully support the FHC and its goals. It has helped to raise the profile of water usage within our sites and we remain committed to continuing to seek ways to reduce our consumption further.'

David Godsmark, Technical Services Controller, Burton's Foods



Water is a critical environmental resource and, although Burton's Foods is a relatively low user of water, it is becoming an increasingly expensive resource for the business. The company therefore pledged its support for the Federation House Commitment in 2008 to help it achieve its aim to reduce overall water usage across the food and drink sector by 20% by the year 2020 as part of the business' internal focus on sustainability issues programme – baking a difference in 2008.

Pledging support to the FHC enabled us to focus all our sites on the challenge ahead. Through the simple process of monitoring and reporting information at a group level across production sites, the company spotted anomalies that could be addressed.

Burton's Foods then conducted a full-scale water investigation across all sites, relative to the tonnes of product baked. This detailed analysis indicated anomalies at its Moreton baking site (the Wirral). Following a more in-depth investigation, Burton's Foods set up further analysis via detailed sub-metering. Two key areas were identified where water usage was not as anticipated. One of these was a previously undetected leak and once detected was easily solved.

A site-specific action plan was then put into place and, at the end of 2009, the company had saved over 63,000m³ of water at this site alone, and an impressive 56% reduction of water used per tonne of product baked. Part of this plan was a three-year programme to replace all metal water pipes with plastic pipes, which will considerably reduce the risk of further water leaks.

Rainwater harvesting

In periods of high rainfall it can be tempting to look at the rainwater as an alternative source of water, especially since installing rainwater harvesting systems can provide a variety of economic benefits.

As with most technologies there are a number of advantages and disadvantages and a business will need to decide if it is an appropriate option for their circumstances.

Advantages

- Considered as 'free' water.
- May help reduce flooding.
- Source of soft water, lowering concentration of salt build-up.
- Can improve the overall BREEAM performance for a building.

Disadvantages

- Can be expensive to retrofit.
- Additional treatment may be required.
- Despite fairly regular rainfall, it is not a constant supply so backup supply is required.
- If connecting a rainwater system to existing plumbing, need to ensure there is no backflow into the mains water system.

Assessing the amount of water and associated cost saving available through the installation of a rainwater harvesting system will help you to calculate the payback period. If the water requires treatment to a high standard, the cost and annual maintenance will be higher than a system requiring only low quality water. Generally, systems with the fastest payback periods utilise large rainfall collection areas to supply a constant demand of general quality water.

A business should:

- quantify the maximum water it can harvest in a year;
- quantify the cost savings;
- consider what the rainwater is likely to be used for and whether any additional treatment is required; and
- consider where to locate the storage tank and whether any modifications are required.

Using rainwater does not necessarily lead to a reduction in the total volume of water used on site as it is likely to replace another water source such as mains water. The table below identifies some common uses for rainwater harvesting projects and associated treatments.

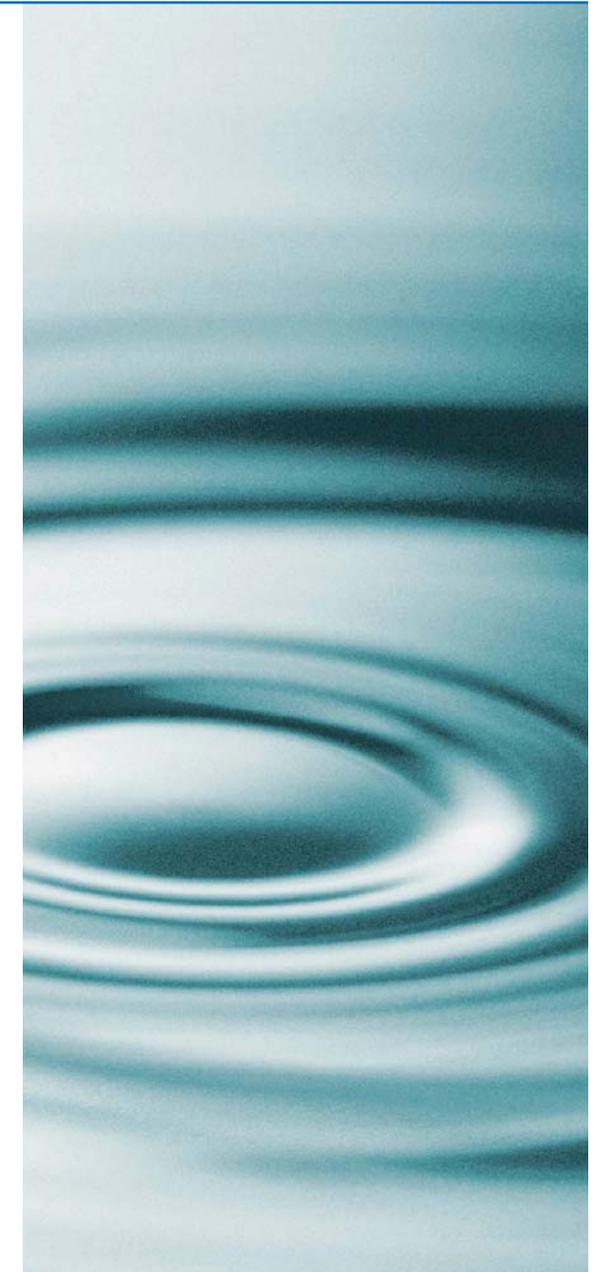


Figure 10 – Common uses of rainwater and associated treatments¹³

Water use	Quality required	Treatment options
<ul style="list-style-type: none"> ■ Nurseries, sports grounds, gardens ■ Toilet flushing ■ Cooking (boilers) ■ General cleaning ■ Filter backwashing 	<p>Low: Water is not used for consumption, and there is a very low risk of contact. Water should look clean and be odour free.</p>	<ul style="list-style-type: none"> ■ First flush diverted ■ Coarse filter
<ul style="list-style-type: none"> ■ Laundry ■ Cleaning of equipment or process cleaning 	<p>Medium: Water is not used for consumption, and there is a low risk of contact. Water must be clean and be odour free, but not necessarily sterile.</p>	<ul style="list-style-type: none"> ■ All of the above, plus ■ Fine filter (possibly membrane filter)
<ul style="list-style-type: none"> ■ Food processing ■ Cleaning food processing equipment ■ Substitute potable supply 	<p>High: Water may be used for consumption, water must be clean, odour free and sterile.</p>	<ul style="list-style-type: none"> ■ All of the above, plus ■ Pathogen removal and/or inactivation (e.g. UV treatment)

For further information see The UK Rainwater Harvesting Association at www.ukrha.org/

¹³ EN896 Reducing mains water use through rainwater harvesting, 2008, Envirowise

Case study Mars in the UK



‘For Mars in the UK, water preservation and conservation is a top priority. Our membership of the Federation House Commitment has helped us to meet our own stringent water targets.’

Emma Webbon, Sustainability Manager, Mars UK

Why we joined FHC

For Mars in the UK, water preservation and conservation is a top priority. Our membership of the Federation House Commitment has helped us to meet our own stringent water targets, and helped us to share best practice, ultimately raising the profile of our industry’s good work.

What we have achieved

At Mars, our target is to reduce water usage by 20% by 2020 in line with the Federation House Commitment.

At our Birstall site, huge water savings have been made over the last few years. Water usage continues to drop, and between 2007 and 2009 it decreased by 13% as a result of a number of initiatives, including reducing the level of wet cleaning within the factory and conducting studies assessing water usage on our bio-filter.

In our Kings Lynn factory we have installed retort weirs and started using rainwater for watering the gardens. This has helped us to reduce our ‘maximum daily demand’ from our water supplier by 8% in 2009.

In Slough, additional investment is taking place as we de-commission an old water tower following the installation of a state-of-the-art cooling system. Furthermore, we are now tracking water usage via a number of meters, which will help us conduct a comprehensive analysis of water usage across the site and put in place strategies to target specific areas in 2010.

Our Peterborough plant is also installing additional meters throughout the site to ensure a comprehensive analysis of water usage. Peterborough is making excellent progress towards the 2020 target and has

changed a number of working practices to minimise the amount of water used across the site. This has included reducing wet cleaning, reducing the number of wash down hose points, installing dedicated high pressure water units, improving product changeovers in the preparation areas and installing infra-red taps in hygiene stations, along with ensuring that any leaks are identified and repaired quickly. Through these measures, the Peterborough site has achieved a water reduction of 16.5% against tonnes produced (m³/t) since 2007.

We have an ongoing programme of work to deliver through 2010 and beyond to continue to see water savings and efficiencies across our sites.

Purchasing water efficient products

When starting a water efficiency project it is good to implement the no cost and low cost actions that can involve and motivate the team, and get quick water savings. These simple actions could be identifying and fixing leaks, reducing water pressure, putting batteries into urinal controls or encouraging staff to turn off taps.

However, there will come a time when capital purchases are required to continue with the water efficiency project, for example, from refurbishing the washrooms through to installing cleaning in place equipment. Investment of this type is likely to need to meet financial requirements within the company before approval is given.

The cost of implementing water saving devices is often cited as the main barrier to water efficiency, but the savings available from lower mains water and disposal charges can be significant. Plus, UK businesses that pay income or corporation tax can also claim tax relief on water saving devices through the Water Technology List (WTL), which lists more than 1,900 eligible products and forms part of the Enhanced Capital Allowance (ECA) scheme for water efficient technologies.

The web-based list, available at www.businesslink.gov.uk/wtl, enables eligible businesses to claim 100% first year capital allowances when they purchase listed products for use in their business. This provides a helpful cash flow boost and results in a shortened payback period, allowing companies to quickly reap the financial benefits of water efficiency.

Businesses that are further down the process of introducing water minimisation activities may be interested in the potential for the reuse of water within their operations. Water recovery and reuse can help save money by reducing consumption of potable quality mains-supplied water, with payback periods starting from just 12 months.

ECAs are available on recovery and reuse systems provided they meet the published eligibility criteria set out on the WTL website. If successful, the business making the investment will receive a 'certificate of environmental benefit' from Defra that certifies the 'system' as qualifying for the ECA.

Unilever, a FHC signee, received a certificate of environmental benefit in 2007 for its effluent treatment plant at its Marmite factory which enables approximately 40% of process effluent to be reused in the factory, for example as top-up water for the steam and cooling water systems.



Martin Beckford, Factory Manager at Marmite's Burton-on-Trent site comments:

'The Enhanced Capital Allowance scheme highlights how businesses investing in water efficient technology can help to protect the environment, while improving their financial performance and benefitting from accelerated tax relief when dealing with this significant type of investment. At Unilever we call this 'doing well by doing good' and the ECA definitely helped us to secure management buy-in to the project.'

Case study Warburtons



‘For Warburtons, the Federation House Commitment is an important part of our Corporate Responsibility programme, helping us to manage and reduce our water use throughout the business.’

Sarah Miskell, Corporate Responsibility Director, Warburtons



Water and the wider picture

For Warburtons, the Federation House Commitment is an important part of the corporate and social responsibility programme that we are now building into every area of our business. The FHC is helping us with practical advice and we are far more focused on managing our water usage.

Everyone has a role

Warburtons is not a heavy user of water, but we recognise how important it is for all of us, both as businesses and individuals, to do what we can to reduce its use, minimise waste, recycle and make the most of the opportunities offered by water harvesting. For this reason, we support the Federation House Commitment and have written its water use reduction target into our published environmental policy.

Starting with the basics

For us, improving our water management began in 2008, when we did an accurate analysis of how much water came into our bakeries and how much went out as waste. We looked at what was used where; how much was essential to our production processes and how much we were using in other areas, where worthwhile savings could be made.

New mains and sub-meters were fitted in all 14 of our bakeries (around 120 meters in total) and all significant water usage is now measured and monitored weekly. In 2009, we concentrated on good housekeeping, identifying and eradicating leaks, eliminating the use of hoses, introducing smart hand washing and using reduced volumes of WC flushing.

Stepping up a gear

Now we have established business-wide ‘Green Teams’, tasked with identifying water and energy savings, delivering ‘action plans’ and engaging everyone in the business with the importance of doing this; best practice is being shared both within the business and with other companies.

At a time when the business is growing rapidly, we have made modest reductions in our water use. Now we are exploring harvesting rainwater from roof space for non-food related uses, such as cleaning vehicles, bread baskets and feeding boilers and are hoping to make much bigger savings. The FHC will continue to help us make the most of the environmental and commercial opportunities saving water represents.

Case study Young's



'Since joining the Federation House Commitment Young's has undertaken a proactive approach to reducing water usage across its sites, to improve efficiency and drive profitability.'

Dave Penson, Energy and Environmental Manager, Young's



Using the tailored support of the FHC, Young's has benefited from attending specialist water-efficiency workshops, and advice in developing its water saving action plans, which have helped highlight areas of potential savings. Being part of the FHC has demonstrated the company's commitment to achieving water reductions and to help the industry reach its 20% target by 2020.

Undertaking water mass balance exercises across the sites helped Young's understand its water consumption and develop key environmental performance indicators. Current water saving actions being investigated at the Young's South Quay site include the treatment of effluent to enable its use for wash down procedures, and the conversion of hydraulic power pack cooling which is a once-through system to closed loop, both of which currently

consume approximately 250m³ per week. The general maintenance of faulty valves and leaks is now firmly embedded in the engineering management systems. The South Quay site has also introduced sub-metering, to identify areas of high water use to prioritise actions. Key actions included the following:

- decentralising hot water distribution systems to local systems creating more accountability and challenging where expensive hot water is actually required;
- changing industrial fryer cleaning practices – filling the fryers, previously left to operator discretion, is now controlled using a timer that delivers the exact amount of water to carry out the task;
- improving cooling tower performance – consumption is now logged to ensure water use is kept to a minimum;

- reducing water pressure distribution across the site – this was a 'win win' with reduction in water usage and the removal of two of five pump sets which also saved energy use; and
- fitting all taps with aerated nozzles, which delivered measurable savings of 50%.

Young's has used the tools that the FHC has provided to share skills and knowledge across the group and has now delivered savings of up to 30% reduction across the group, resulting in a staggering 155,000m³ savings since joining the FHC in 2007. Aggressive targets are now in place for the next five years aimed at bringing about a 7% reduction in consumption year on year. Young's is fully committed to the FHC and recommends that other companies within the food and drink sector join, and help work towards achieving the industry-wide target.

Case study United Biscuits



‘United Biscuits is delighted at the progress we are making against our water saving goal. Our original target of a 25% saving by 2020 will be achieved in 2010, ten years early. We are now increasing our target to a 45% saving by 2020.’

Bob Brightwell, Head of Corporate Communication, United Biscuits



In the last two years United Biscuits (UB) reduced its UK water use by 28% against a goal to achieve a 25% reduction by 2020. Last year alone, eight out of UB’s eleven manufacturing sites achieved a saving in water use per tonne of product.

In late 2009, UB introduced a new water recycling and cleaning system at its snacks factory in Billingham, Teesside, where the potato processing area accounts for the majority of UB’s water use.

Water is used for washing, transporting, peeling and slicing potatoes and was previously only used once. However, to reduce the amount of fresh water consumed, UB developed a system that would sufficiently clean the water to allow it to be used again. The used water is now passed through a water treatment system using biological treatment and filtration before returning it to a blending tank with fresh water, which is then used in the potato processing area. Recycling water in this way is expected to save approximately 500,000m³ of fresh water per year, reducing UB’s water consumption by more than 30% and we have, therefore, increased our goal from a 25% saving to a 45% saving by 2020.

The Federation House Commitment – steps to progress

Signatories to the FHC pledge to follow five steps to progress.

Step 1 – Develop a 2007 water use baseline

Water data for 2007 is submitted for each manufacturing site. This data is used to form the 2007 baseline.

Data should be submitted within three months of making the commitment.

For multi-site organisations, this can be taken forward as a staged process, building up to full coverage over a period to be agreed in advance between each relevant signatory and WRAP.

Step 2 – Assess water use at each manufacturing site

Each manufacturing site maps its water usage and constructs a water balance. This step is designed to identify those areas on site that have higher water usage and is used to pinpoint potential areas to investigate for further water efficiencies.

Step 3 – Develop a site-specific action plan

Once specific water usage areas have been identified on which to focus, a series of actions to provide on-site improvements to reduce water usage are planned.

Action plans should be submitted within six months of making the commitment.

Example actions might include the opportunity to optimise CIP, or to investigate water reuse as part of overall operations.

Step 4 – Implement the actions identified

This step realises the potential water efficiencies that have been identified and the associated cost savings.

Step 5 – Report annual water and cost savings

Ongoing monitoring will provide the results of the actions that have been implemented. The reporting of the results demonstrates the improvements that have been made on an annual basis.

Water use for each active site should be reported to WRAP annually.

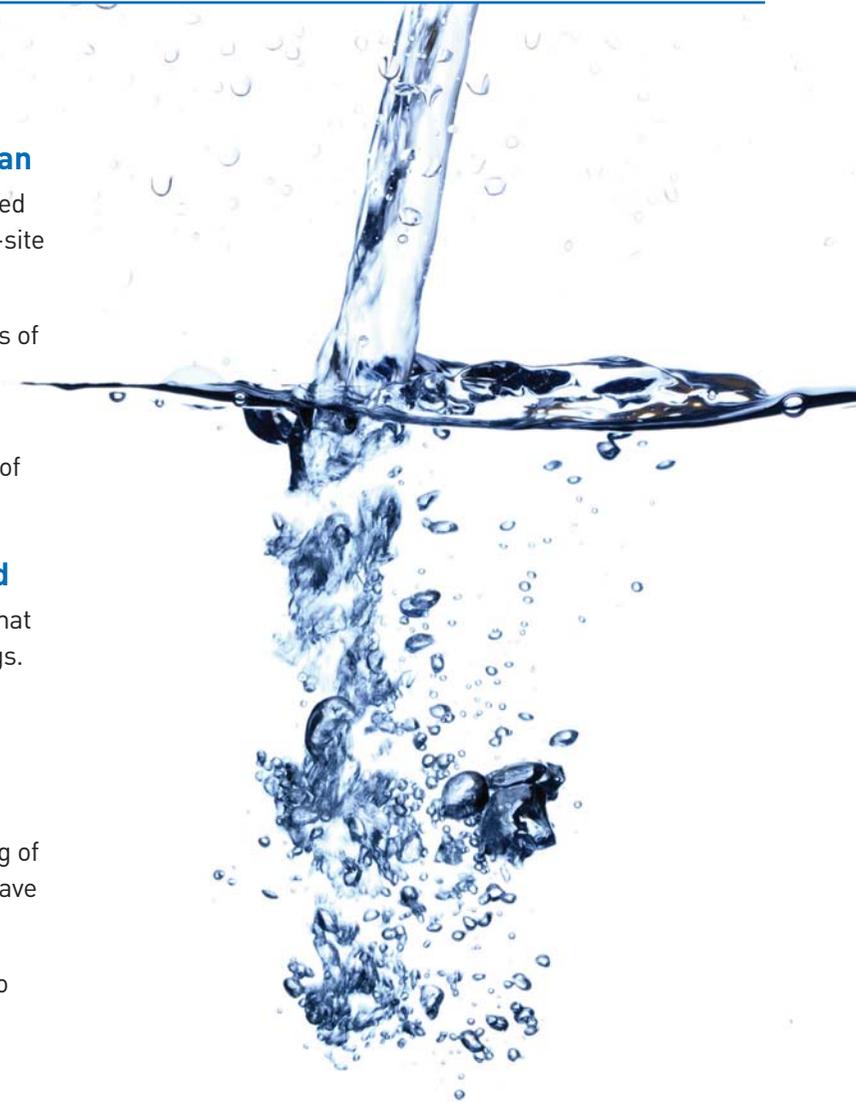
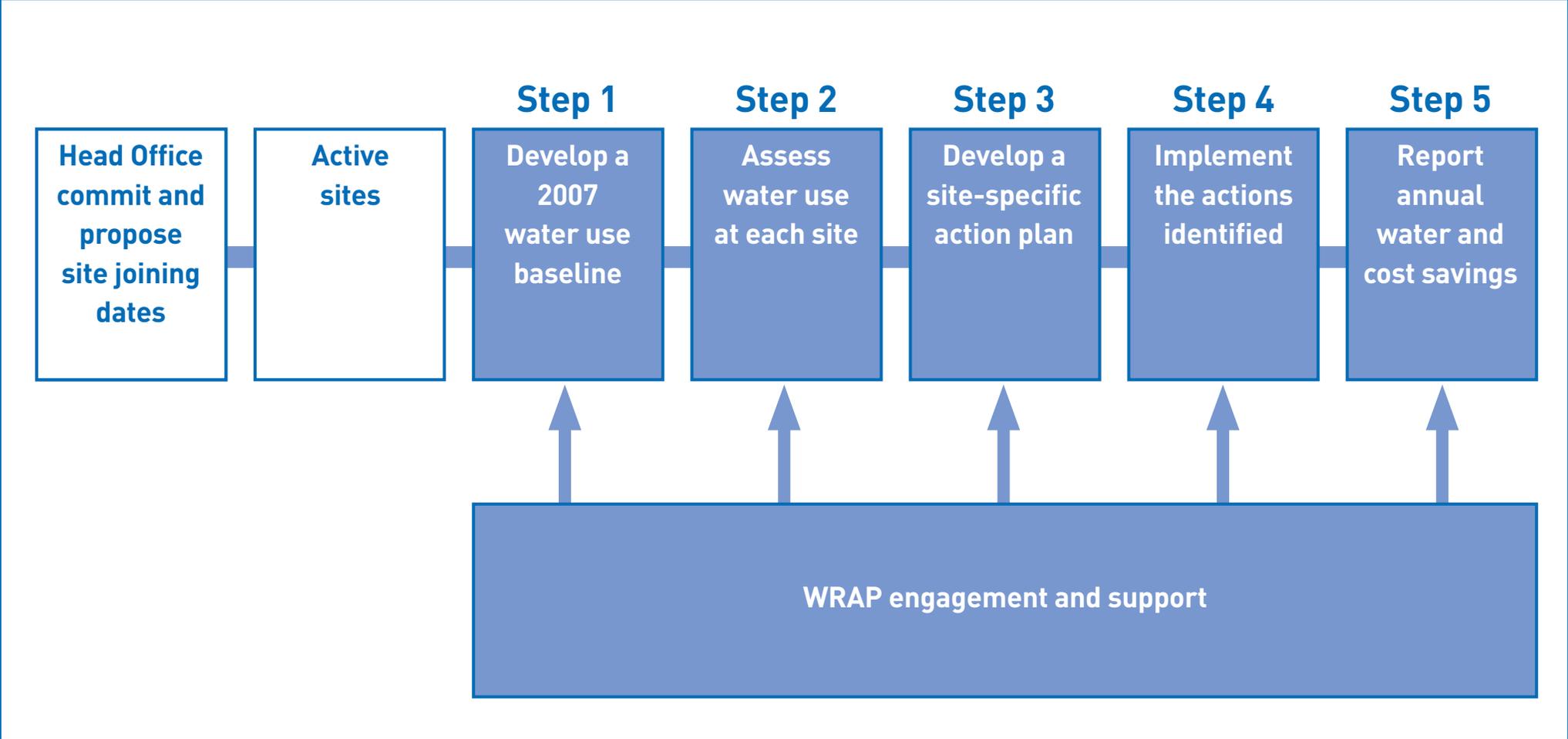


Figure 11 – FHC: Five steps to progress



New management

Following Defra's Delivery Landscape Review in 2009, work previously carried out by resource efficiency delivery bodies, including Envirowise, has been integrated into the role of WRAP. As a result WRAP is now responsible for delivering the FHC working closely with the FDF. WRAP has appointed Hyder Consulting to manage the Commitment and to provide technical expertise to signatories on water efficiency within the food and drink sector.

Data confidentiality

Individual company data is held by WRAP in confidence in accordance with data protection legislation. All company data is aggregated to report an industry-wide 2007 baseline and annual progress.

New and improved signatory benefits

New and existing signatories to the FHC can now benefit from a package of support to help them progress through the five steps and realise water savings and associated benefits. This includes:

- up to three days¹⁴ on-site implementation support from a technical water expert. This could be used to help draft a water mass balance, to develop an action plan or to advise on implementation actions;
- access to a number of on-line tools to support water saving activities. This includes a Water Monitoring Tool, a Water Accounting Tool and a tool to calculate charges for effluent treatment and disposal;
- access to benchmarking information and Good Practice Guidance;
- opportunity to participate in a peer working group to share best practice, address specific issues and drive success;
- opportunity to promote your success through the development of case studies and industry events; and
- access to a dedicated FHC team by telephone and e-mail.

¹⁴ Three days/ company. This will be provided by Hyder Consulting

FHC signatories

apetito	Natures Way Foods
Bettys & Taylors of Harrogate	Nestlé
Birds Eye	Newly Weds
British Bakels	Northumberland Cheese Company
Britvic	Northumberland Foods
Burton's Foods	Paramount 21
Cadbury	Pataks (AB World Foods)
Coca-Cola	Paterson Arran Ltd
Cott Beverages	PepsiCo
Cranswick Country Foods	Premier Food Group
Dairy Crest	R&R Ice Cream
General Mills	RWM Foods
GlaxoSmithKline	Tate & Lyle
Greenvale AP	UIN Foods
Framptons	Unilever
Freshtime	Uniq
Kellogg's	United Biscuits
Kraft	Warburtons
Mars	Weetabix
Moray Seafoods	William Jackson
Müller	Young's Seafood

For further information about the FHC

E-mail: fhc2020@wrap.org.uk

Web: www.fhc2020.co.uk

For further information about the FDF

Web: www.fdf.org.uk

For further information about resource efficiency contact WRAP

Tel: 0808 100 2040

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