

# The Milk Roadmap: One year down the Road August 2009



Produced by the Dairy Supply Chain Forum's  
Sustainable Consumption & Production Taskforce



The Dairy Supply Chain Forum's Sustainable Consumption and Production Taskforce has been chaired by Dairy UK and draws membership from the following organisations who have worked in partnership to develop the Milk Roadmap:



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## **1. Foreword**

The Milk Roadmap was an ambitious and challenging set of targets for the Dairy Supply Chain. One year on, all parts of the industry have made good progress and are still very committed to reducing their environmental impact.

The Milk Roadmap in England was, and still is, groundbreaking; other sectors and other countries are seeking to learn from us: a sure sign of a well thought-out project.

I have recently taken over as Chair of this supply chain task force and I have to commend the work of the group so far; in particular the work of the outgoing chairman, Dr Ed Komorowski.

Good progress has been made during the first year; it is important that we maintain the momentum and drive to achieve or even exceed the targets so that we can continue to demonstrate to consumers that the dairy industry is committed to sustainability.

**Tim Bennett**

**Chairman of the Dairy Supply Chain Forum's Sustainable Consumption and Production Taskforce**

## 2. Executive Summary

The launch of the Milk Roadmap in May 2008 brought a renewed focus to the environmental performance of the whole dairy supply chain and one year down the road the dairy industry is demonstrating its commitment to cut its environmental impact by achieving the targets. These improvements have been made by all sectors of the dairy supply chain from the farm to the consumer.

In May 2008 the dairy supply chain published the Roadmap, setting targets for 2010, 2015 and 2020. This document sets out the great progress being made by dairy producers, processors and retailers against their targets.

For 2010 dairy producers committed to 50% of dairy managed farmland being entered into an Environmental Stewardship Scheme. One year ahead of schedule are already at 45% of farmland. In addition producers committed to 65% of dairy farmers actively nutrient planning by 2010 and are on target (according to a survey in 2008) with 47% of dairy farmers stating they have a Nutrient Management Plan which is updated on a yearly basis. Producers are also making good progress against 2015 targets on carbon footprinting and trialling new technologies to reduce emissions from agriculture.

Milk processors are also on target to meet 2010 targets on recycled plastic in milk bottles, environmental benchmarking and meeting government targets on carbon reductions and energy efficiency.

The sector expects that by the end of 2009 about 25% of the milk bottles supplied by dairy companies will meet the target of 10% incorporation of recycled HDPE, and expect to meet the targeted incorporation rate of 10% rHDPE in milk bottles by the end of 2010. Continued success for this target will depend upon the growth in doorstep collection of recycled post consumer waste from the doorstep - which is being encouraged by DEFRA and WRAP and needs to be supported by initiatives from Local and National Government. Reductions in the collection of recyclable plastics will put pressure on the industry meeting this target.

In addition, Dairy UK has launched an environmental benchmarking tool which will capture data relating to a wide range of environmental metrics including, energy use, greenhouse gas emissions, packaging and waste. To date the benchmarking tool has collected data on well over 50% of the total milk processed and almost 100% of the liquid milk processed in the UK.

Full details of the progress being made by all parts of the supply chain is outlined in the detailed reports section of this report. Below is a table of the progress being made by producers and processors towards their 2010 targets, where green indicates meeting target and amber represents moving towards target.

	2010 Targets	Progress
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<b>Producers</b>	50% of dairy managed farmland entered into an Environmental Stewardship Scheme	On target: 4462 currently = 45% of dairy famers
	5-15% reduction in water use	Data collected and report written providing a benchmark for first reporting year, 2010.
	65% of dairy farmers actively nutrient planning and therefore reducing nitrogen runoff.	On Target: 47% of dairy farmers responding to survey had a NMP plan and updated it on a yearly basis
	30 farms piloting on-farm anaerobic digestion for improved sustainability and generation of energy from renewable sources.	Currently gathering data
	95% of dairy farmers to have a manure management plan.	On target - Current level: 94.8%
	95% of dairy farmers to have farm health plans	On target - Current level 95.1%
	20-30% of producers trialling new technologies to reduce emissions from agriculture	On target – Current level 32%
	Dairy farmers to improve energy efficiency by 15%	Currently gathering data

<b>Processors</b>	All processors to meet or beat energy and CO2 reductions of the climate change agreements (CCAs)	On target: Met 2008 target and on course to meet 2010 target
	10% recycled plastics in packaging materials	On target: Should reach 10% incorporation rate for milk bottles by end of 2010*
	Environmental benchmarking and best practice programme.	On target: Dairy UK has launched a Benchmarking tool and will be developing a best practice programme in 2009 and 2010.
	Annual sustainability report (will evaluate success with targets)	Data is being collected and aim to publish first annual report in 2009

\* Continued success in this area will depend upon the growth in doorstep collection of recycled post consumer waste from the doorstep and needs to be supported by initiatives from Local and National Government.

In addition to continued commitment towards the current targets, the industry is also mindful of future challenges and opportunities and will be developing a wide range of programmes and initiatives for mitigation and adaptation. One such issue is the increasing focus on embedded water and the supply chain will work together to better understand the implications for the industry.

### 3. Introduction

The Milk Roadmap was launched in May 2008 and set out a vision for a sustainable dairy industry and set a course of practical actions, including challenging short, medium and long-term targets, to deliver this vision. This document examines the progress made by the dairy supply chain towards these targets and highlights the commitment of the dairy sector to continual improvement of its environmental footprint. The Roadmap was drawn up by a working group chaired by Dairy UK, with membership from across the milk supply chain including feed and fertiliser manufacturers, farming organisations, processors, retailers, packaging suppliers and consumer organisations. The Roadmap is a living document which will be kept under review, so that progress can be measured and additional targets added to take account of new developments.

### 4. Vision for 2020

“Achieving sustainability of the dairy supply chain by working to improve the environment while prospering in a free competitive market place, through the supply of safe, healthy and nutritious foods.”

### 5. Aims of the Roadmap

The Milk Roadmap is a tool to help better understand the environmental, social and economic impacts of milk, and the various ways in which these impacts can be mitigated. This document provides an update to the current political environment and developments in environmental policy and regulation.

### 6. Detailed Reports

#### 6.1 On Farm

The launch of the Milk Roadmap in May 2008 has brought a renewed focus to the environmental performance of the whole dairy supply chain. For dairy farmers, the targets set in the Roadmap are ambitious, but in no way compromise the economic viability of dairy farming. The targets are wide ranging in terms of their environmental objectives, however, all are built on the objectives and principles set out in the Environmental Plan for Dairy Farming (EPDF) of promoting integrated solutions to addressing environmental challenges on dairy farms.

A great deal of achievement has been made against these original objectives; demonstrating that environmental challenges on dairy farms can be overcome by adopting measures and solutions that bring both an environmental benefit, and as important an economic one.

#### **Roadmap Targets: monitoring, measuring and reporting 2010 – 2015 (short and medium term targets)**

- **Environmental Stewardship:** Increasing uptake of ELS (50% of farmland by 2010; 65% by 2015)

#### Activity and Progress

Natural England data has revealed that almost 4,500 dairy farmers are currently part of an Environmental Stewardship Scheme.

Encouraging dairy farmers to participate in the Entry Level Scheme remains a priority. However, the removal of management plans from ELS was a serious blow to dairy farmers, reducing the number of dairy farms which would be eligible to apply. As a result the NFU, DairyCo, Dairy UK, EA and RABDF produced a promotional leaflet in June 2008. The leaflet, 'Dairy Farming and the Entry Level Scheme' highlights the benefits of ELS to dairy farming, the 50 different options available to gain points and an overview of the application process. The leaflet also provides a farm case study, highlighting that ELS on dairy farms can prove to be both environmentally and economically worthwhile.

It is proposed to amend the target to include % of dairy farmers, as well as % of farmland. Improved data sets are now available, but both figures are needed to monitor any change in % of farmland in the scheme as dairy farmers continue to leave the industry.

### Measurement

Official uptake figures and percentage data are available from Natural England (NE). They agreed to provide regular updates. Proposal to update target to total number of dairy farms in light of change in NE reporting.

### **Target Status**

On target: 4462 currently = 45% of dairy farmers

- **Water Efficiency** : 5- 15% reduction in water usage per litre of milk (proposal to amend target to measure % take-up of water efficiency measures)

### Activity and Progress

DairyCo designed and disseminated a 'Water Efficiency Survey' to all dairy farmers in their Dairy Business Groups. This survey was also promoted to NFU dairy farming members. An amendment to the previous target is suggested, which would measure the number of dairy farmers adopting water efficiency measures on farm, as opposed to a numeric reduction in water usage per litre of milk, which is very difficult to measure. This also allows DairyCo to identify the types of water efficiency measures that have been adopted.

### Measurement

DairyCo annual water use survey of discussion groups. 2009 survey of dairy farmers provided the first data set for this target. This year's survey will provide the benchmark for future years and the aim is to carry out the survey annually, encouraging more farmers to part to complete the survey in order to provide robust and accurate data for future years. An encouraging 79% of farmers surveyed checked their farm water points for leaks, 73% of farmers had made changes to their management of clean water in the last 24 months and 40% of farmers are intending to make changes to improve their water use efficiency in the next 12 months.

### **Target Status**

Data collected and report written providing a benchmark for first reporting year, 2010.

- **Nutrient Planning:** 65% actively nutrient planning by 2010; increasing to 90% by 2015

#### Activity and Progress

A confluence of several factors over the past two years has led to increasing numbers of dairy farmers using nutrient management plans on farm. The development of tools to help farmers with nutrient planning, the regulatory impact of a new NVZ Action Programme and rocketing input costs have meant an increasing uptake in nutrient management planning. This is recognition of the fact that many dairy farmers see nutrient management as a win-win solution.

The 'Tried and Tested' model, as a simple paper-based guide to nutrient management planning, developed by an industry group (NFU, CLA, AIC, FWAG and LEAF) was re-launched in 2009 with the livestock and dairy sectors in mind. 'Tried and Tested' guides farmers through the process of creating a nutrient management plan and enables users to manage manure and fertiliser applications more efficiently, highlighting that good nutrient management planning can be straightforward, inexpensive and can offer sound benefits.

#### Measurement

Defra Farm Practices Survey Data. The Industry has asked for additional nutrient management questions to be included in the 2008 survey which reports in August 09.

Professional Nutrient Management Group Survey data.

#### **Target Status**

On target: 47% of dairy farmers responding to the 2008 survey had a NMP plan and updated it on a yearly basis

- **Anaerobic Digestion:** 30 on-farm AD units by 2010

#### Activity and Progress

The Environment Agency's decision to revise its regulatory position on the waste status of anaerobic digestate produced from farm-based inputs in December 2008 removed a strong disincentive to the use of AD digestate and the advancement of AD technology on-farm generally.

Under the regulations, previously manure and slurry treated in AD plants were considered 'wastes'. Farmers were required to take out an environmental permit or waste management exemption if they wanted to spread the digestate on their land which meant unnecessary administrative and cost burdens. Now the digestate will not be considered as 'waste' provided it is used as fertiliser on agricultural land in the way undigested manure and slurry would be.

This decision by the Environment Agency removes a significant barrier to the development of small-scale on-farm AD. This should help stimulate greater use of digestates on farm land and hopefully encourage more farmer investment in AD technology.

## Measurement

Case studies (to include individual farm installations and collaborations)

Government / RDA supported initiatives / AD plant equipment sales.

## **Target Status**

Currently gathering data

- **Manure Management Plans:** 95% of producers have a MMP (and are actively using)

## Activity and Progress

Pass-rate figure at full audit over the last year is 94.8%<sup>1</sup>. Most non-conformances will be because of lack of detail rather than the absence of a Plan.

## Measurement

ADF compliance data  
Professional Nutrient Management Survey

## **Target Status**

On target: Current level 94.8%

- **Farm Health Plans:** 95% of producers have a FHP (and are actively using)

## Activity and Progress

Pass-rate figure at full audit over the last year is 95.1%. Most non-conformances are on account of lack of detail rather than the absence of a Plan.

## Measurement

ADF compliance data  
Farm Health Planning Group

## **Target Status**

On target: Current level 95.1%

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<sup>1</sup> ADF figures are based on pass rates at full assessments. At point of certification, assured producers should actually be 100% compliant. A remedial period is given after the first full assessment to allow non-conformances to be put right and for certification to be continued. Evidence of rectification must be submitted.

- **Trialling new technology:** 20 – 30% of producers trialling new technologies to reduce emissions from agriculture

#### Activity and Progress

DairyCo is currently running a feed efficiency campaign (which began in September 2008). Over 700 dairy farmers having attended Feeding<sup>+</sup> meetings and 1580 Feeding<sup>+</sup> folders have been sent out, demonstrating a positive approach to improving feed efficiency. DairyCo is also part of a Defra Steering Group Committee investigating ruminant nutrition regimes to reduce methane and nitrogen emissions based on previous research work funded by DairyCo.

#### Measurement

DairyCo survey of discussion groups showed that of the 32% of farmers implementing “new technologies”, 40% have implemented slurry injection. Other “new technologies” currently being used by farmers are anaerobic digestion and using feeding systems to increase efficiency.

#### **Target Status**

On target: Current level 32% of farmers surveyed

- **Continued declining trend in pollution incidents on dairy farms**

#### Activity and Progress

The EA’s Spotlight on Business Report 2008 revealed that pollution incidents to water, land and air from agriculture in England and Wales are decreasing, and are at their lowest ever levels. This performance demonstrates the proactive efforts made by dairy producers and advisors to drive environmental change at the farm level and illustrates the work of the Environment Agency and its partners in regulating the industry.

#### Measurement

EA Monitoring data: annual ‘Spotlight Report’.

#### **Target Status**

On target: Report due later in 2009

- **Carbon Footprinting:** Dairy farmers encouraged to calculate the carbon footprint of the farm

#### Activity and Progress

DairyCo is currently funding a project to produce six factsheets advising farmers of definitions and explanations of GHG, sources of GHG from dairy systems and what dairy farmers can do to improve their efficiency to reduce emissions. Industry representatives have met to discuss

data collation in order to provide the industry with the trends in carbon equivalent outputs from dairy farms. There are currently 3 accredited (or very close to accreditation) carbon footprinting models.

#### Measurement

Retail / dedicated group figures / farm consultants

#### **Target Status**

Currently gathering data

- **Dairy farmers to improve energy efficiency by 15% by 2010**

#### Activity and Progress

The Royal Association of British Dairy Farmers (RABDF) is currently undertaking a survey on energy efficiency on farms through the Geronimo Survey.

#### Measurement

*Establish current level of energy use on dairy farms*

#### **Target Status**

Currently gathering data

#### Bovine TB

While there is not a specific target for bovine TB in the Milk Roadmap, this remains a key concern for the dairy industry. Cattle slaughtered because of the disease approached 40,000 in 2008. This had a significant effect on the environmental performance of the dairy sector with the need for rearing replacement animals which directly affects the carbon efficiency. In addition, the disease represents a considerable cost to the industry

## 6.2 Processors

### Update on Initiatives for the Dairy Processing Sector

Dairy processing covers a wide range of operations and products and the industry recognises the importance of mitigating its environmental impact if it is to continue to benefit society in a sustainable manner.

Since publication of the Milk Roadmap in May 2008, the industry has continued to develop a series of complimentary, parallel initiatives in conjunction with the trade body, Dairy UK, and other governmental and industry stakeholders which aim to meet this objective.

In setting out a vision for the processing and distribution section of the Milk Roadmap, the industry brought together the key elements from these initiatives to form one consolidated and coherent vision for 2020 and this section provides an update on each of the initiatives.

### Progress against targets

Many companies have incorporated the aims and targets of the Roadmap into their business plans for the coming years.

#### 2010 Targets

- **All processors to meet or beat energy and CO<sub>2</sub> reductions of the Climate Change Agreement**

The dairy sector met the target for the fourth milestone of the Climate Change Agreement and the sector is working towards the fifth target period which will begin on the 1st October 2009.

At the fourth milestone the dairy sector beat its target of an 11.3% reduction in relative energy use compared with a base year of 1998 by 10.3% with a total reduction of 21.6%. This resulted in an absolute saving in energy terms of 0.8 PJ, which is equivalent to an absolute saving of 40 kilotonnes of CO<sub>2</sub>.

#### **Target Status**

On target: 2008 target met and on course to meet 2010 target

- **10% recycled plastics in packaging materials**

The processing sector is working towards the target of 10% recycled plastics in milk bottles. As mentioned earlier, Greenstar WES has become the first approved UK based supplier of rHDPE for use in milk bottles, with 2 major dairy companies so far providing approval for the use of 10% of the recycled HDPE to be used in the supply of plastic for use in milk bottles.

Over the next 12 months it is expected that additional dairy companies in the UK will approve the use of rHDPE in milk bottles and the sector expects that by the end of 2009 about 25% of

the milk bottles supplied by dairy companies will meet the target of 10% incorporation of rHDPE.

With additional dairy companies approving the use of rHDPE in milk bottles and the development of additional processing capacity in the UK for the production of rHDPE, it is expected that the industry will meet the target of 10% rHDPE content in milk bottles by the end of 2010.

Continued success in this area will depend upon the growth in doorstep collection of recycled post consumer waste from the doorstep which is being encouraged by DEFRA and WRAP, and needs to be supported by initiatives from Local and National Government.

### **Target Status**

On target: Should reach 10% incorporation rate for milk bottles by end of 2010

- **Environmental benchmarking and best practice programme**

In April 2009 Dairy UK launched their benchmarking tool for the dairy processing sector which will collect Environmental Key Performance Indicators (KPIs) for the dairy industry. The tool has been designed to capture data relating to a wide range of environmental metrics including, energy use, greenhouse gas emissions, packaging and waste.

To date the benchmarking tool has collected data on well over 50% of the total milk and almost 100% of the liquid milk processed in the UK.

Dairy UK will be planning a number of events over the next 12 months to promote best practice within the sector.

### **Target Status**

On target: Dairy UK has launched its Benchmarking tool and will be developing best practice programmes in 2009 and 2010

- **Annual sustainability report**

With the data collected from the benchmarking tool Dairy UK will publish an annual sustainability report, demonstrating performance improvements over time (year on year) against the environmental KPIs relating to a wide range of environmental metrics including, energy use, greenhouse gas emissions, packaging and waste. This report will reiterate the commitment of the processing sector to meeting the targets set out in the milk roadmap.

### **Target Status**

Data is being collected and aim is to publish first report in 2009

## Looking towards 2015 and 2020

The processing sector has also started to make improvements towards the targets set out for 2015 and 2020. The sector is putting in place systems and is well on the way to delivering the improvements set out in the medium and long term targets of the milk roadmap.

One particular area of intensity has been the drive towards zero ex-factory waste to landfill for the large processors in the UK. From the latest data collected through the benchmarking tool dairy companies are already recovering over 75% of their waste and preventing this waste from going to landfill. For the liquid milk processors the percentage of waste diverted from landfill is up to about 80%. For the industry as a whole this equates to over 25,000 tonnes of solid waste which is recovered annually.

Dairy UK is also developing a carbon calculator for dairy companies to use, which helps dairy companies towards the development of carbon management programmes at dairy sites across the UK.

Despite good progress on waste and water reductions, the processing sector will need to develop a plan for renewable energy in order to meet the target of 10% of non-transport energy coming from renewable energy or CHP by 2015. Dairy UK will also be developing a series of workshops around the development of renewable energy at dairy sites in the UK.

Since the publication of the Roadmap in 2008 there has been an increasing focus on water and embedded water, with both producers and processors committed to making reductions in water use and improving the water footprint of the UK dairy industry.

Water footprinting, the application of the concept of embedded water, is equivalent to carbon footprinting, however with embedded carbon, despite the complexities in the measurement once the carbon emissions have been calculated, a tonne of CO<sub>2</sub> emitted in the UK is equivalent to a tonne of CO<sub>2</sub> emitted elsewhere in the world. However for water, the use of one litre of water in the UK will be very different from a litre of water from other parts of the world. For water, the source is as important as the volumes used.

### **6.3. Retailer and Consumption**

The retailers involved in the Taskforce have shown their commitment to the environmental agenda and the following are highlights of the work of retailers both at the retail level and on farm.

#### Retail Stores

The retailing sector is committed to reducing its environmental impact and has committed to significant reductions in greenhouse gas emissions over the coming years. One key area of focus is the development of low-carbon retail stores. Major retailers are seeking to make significant savings on the energy, fuel and water usage and are committed to the development of renewable energy technologies. Retailers have made significant investments in energy saving technologies for their stores, including low-energy lighting and more efficient refrigeration.

#### Transport

Significant savings in emissions have also been achieved from transport improvements, with retailers making improvements to the transport efficiency with fewer vehicles moving more goods. Retailers have also invested heavily in alternative transport, including the introduction of double decked lorries, and the use of both trains and water- based transport systems.

#### Waste

Retailers are also committed to not sending waste to landfill and have made considerable progress in recent years. Retailers are also encouraging consumers to recycle with the introduction of improved recycling facilities at retail stores across the UK, including the introduction of automated recycling facilities.

#### Packaging

Major retailers and many of their suppliers are signatories to the Courtauld Commitment and are working in partnership with WRAP to develop new packaging solutions and technologies across the whole UK supply chain. This includes using innovative packaging formats; reducing the weight of packaging (e.g. bottles, cans and boxes); and collaboration on packaging design guidance.

In recent years retailers and suppliers have managed to reduce packing waste by between 25 – 30% and are committed to ensuring carbon savings from packaging by developing low-carbon packaging.

#### Local Produce

Over the past year retailers have also encouraged local producers into stores and have developed local brands, which not only helps reduce some of the impacts of the supply chain but also supports local communities.

#### Carrier Bags

Retailers continue to encourage consumers to reduce the use of plastic carrier bags and have developed alternative bags such as the introduction of “bag for life” schemes. This has helped retailers reduce the use of plastic bags by between 25 – 40%.

## On-farm

Asda, Sainbury's, and Tesco have all been working directly with their farmers to help improve the environmental impact of their supply chains. Retailers have invested in research into reducing energy use on farm and on nutrition planning to help reduce GHG emissions.

Retailers have also invested in carbon footprinting which has enabled farmers to identify hotspots in their businesses and helped to both reduce carbon emissions and improve cost efficiency.

## **7. Government supporting actions for the Roadmap**

### Farming Futures Project

The Farming Futures coalition was delighted by Defra's recent announcement that £150,000 of funding has been secured to enable the successful project to continue communicating climate change messages to farmers and land managers.

The project has benefited from high-profile support from the likes of Lord Rooker, Jonathon Porritt and the Rt Hon Hilary Benn, who said at the Oxford Farming Conference this year that he "welcomes the achievements of the Farming Futures project in giving farmers advice on tackling climate change".

Farming Futures is a communications collaboration project, coordinated by Forum for the Future, on behalf of the NFU, CLA, AIC, Defra and the AHRF (representing the agricultural and horticultural levy boards). The further funding from Defra will allow the project to continue until March 2010, and within that time a long-term home and funding strategy should be decided.

The new monies will enable Farming Futures to:

- Continue to deliver a programme of on-farm workshops showcasing practice case studies for mitigating and adapting to climate change.
- Translate R&D into practical messages.
- Develop closer relations with the Rural Climate Change Forum and other industry bodies.
- Continue creating, identifying and supporting climate champions.
- Further develop the projects fact sheets and case studies for farmers and land managers.
- Continue raising awareness of climate change, and encouraging behaviour change across the sector.
- Expand the reach of the project and raise its profile among farm advisors, young farmers and agricultural students.

It is expected that a Dairy Sector event will be held in 2009 and other events with an interest for dairy farmers will also be held throughout the year (AD, pests, diseases, etc). The next event planned at the moment is:

### The Bio-energy Capital Grants and Bio-energy Infrastructure Schemes

In October last year Defra commissioned a study by ADAS to explore the policy instruments needed to achieve cost-effective GHG abatement from the agriculture, forestry and land management sector (AFLM). This study will also consider emissions trading in the sector among other policy instruments. It will take as its starting point the work which the Committee on Climate Change (CCC) commissioned from the Scottish Agricultural College (SAC) to develop Marginal Abatement Cost (MAC) curves for agriculture, land use, land use change and forestry, which established the technical abatement potential for the sector. The study will also draw from an earlier study Defra commissioned from NERA Economic Consulting on the potential for market mechanisms for reducing GHG emissions from the AFLM sector – to explore the feasibility of a greenhouse gas emissions trading scheme for the sector.

### Carbon Footprint Methodology (PAS2050)

PAS2050 was launched in October 2008 to provide a standard approach to assessing GHG emissions in goods and services. Its method has been downloaded from the BSI website over 10,000 times as of March 2009.

Defra are currently monitoring uptake of the method and encouraging businesses to utilise the specification to highlight GHG hotspots along their supply chain and seek to reduce them.

Users of the specification are encouraged to provide feedback to BSI via their website. BSI are required to review the specification within two years of launch. The depth of the review can only be usefully determined with stakeholder feedback detailing their experiences of applying PAS2050 to their goods or services. (website: [www.bsi-global.com/PAS2050](http://www.bsi-global.com/PAS2050)).

As the Carbon Trust is not specifying a methodology, the dairy sector is developing a number of schemes which have Carbon Trust approval but which use different methodology's and measurements.

### Embedded Water

Embedded water is an issue which is rapidly rising up businesses' agendas. Defra have examined the topic in more depth to analyse where policy drivers lie for the Department and determine with stakeholders key actions. This culminated with a workshop at the end of January 2009. Defra is now working with its science team to develop a research project looking at water footprinting and contextualising this into the associated impacts. Research is expected to commence in the summer 2009.

### Sustainable Food for 2030

The Cabinet Office Strategy Unit report *Food Matters: Towards a strategy for the 21<sup>st</sup> Century* (July 2008) recommended that Defra, working in partnership with the Food Standards Agency and the Department of Health defined its goal for a sustainable food system. This work is now underway and aims to articulate what we mean by a sustainable and secure food system, and to set a roadmap, through discussion with food industry stakeholders, to achieving our goal. The work encompasses the whole food system including production, manufacturing, distribution, retail, consumption and waste, and brings our goals for a sustainable and secure food system into a coherent whole. A draft statement has been developed through discussions with stakeholders over the last 6 months. This will form the basis of a discussion paper which will be published later in the summer to gather further views from stakeholders. We anticipate publishing the final document in the autumn.

### Influencing Consumer Behaviour

Information about some of the options for consumers to lower the impacts of their diet is available on the Greener Living pages on DirectGov<sup>2</sup>. The food pages are a useful information tool to guide consumers through the maze of sustainable food choices. There is information and advice on a range of food issues such as wasting less, labels and seasonality. The pages are Government-run and are updated regularly as evidence and policy develop. It is a successful and well used web site with a number of tips and good advice on food-related environmental issues. Defra are working with the FSA to incorporate information on the sustainability and environment impacts of

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<sup>2</sup> [http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenershopping/DG\\_064434](http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenershopping/DG_064434)

food choices into its online consumer advice (a recommendation of the Cabinet Office *Food Matters* report).

Defra are also working with WRAP to take forward its Love Food Hate Waste campaign. The campaign was launched on 1 November 2007 and aims to raise consumer awareness of the problem of food waste while empowering them to address the amount of food they throw away. Defra have been involved with development of the campaign and have read WRAP's research into consumer attitudes and behaviours with interest. WRAP are also working with retailers, consumer groups and local authorities to deliver the campaign. The reaction to the campaign has been positive and it has been successful so far in linking the issue of food waste to climate change, and highlighting the financial savings that consumers can make by reducing food waste.

Defra commissioned a review of the findings of Defra and Defra-related research on influencing consumers' food-related behaviours. This project has identified the synergies and tensions between the research results in relation to consumer attitudes towards certain behaviour goals (wasting less food, eating food that locally in season, and adopting a lower impact diet). The final report will be published later in the summer.

#### Accessibility of ESS Schemes / uptake of HLS

ELS/OELS agreements from January to December 2006 were made on a provisional basis, pending approval of the RDPE by the EC. As a condition of approval, the EC required that the four management plan options, including the nutrient management plan, be removed from the programme. This did not affect agreements that had been concluded but it did affect about 2,300 applications which were underway.

Despite the concerns raised, the loss of the former plans did not actually have a serious affect on ELS uptake. Of the 2300 applications that were underway, most farmers who had applied were able to make up their ELS points after the loss of management plans. Only 90 decided not to proceed with ELS after the loss of the management plan option.

In order to build on the former management plan options, Defra and Natural England are considering introducing an 'Enhanced Farm Environment Record' under ELS. An initial consultation on the EnFER last November was inconclusive. Whilst likely to deliver environmental benefits (the EnFER requires specific options to be selected), there was no firm evidence that the EnFER would attract significantly increased ELS take up. Its introduction would also have operational impacts, increasing the administration costs of the scheme.

Natural England has agreed with Defra to do some further on-farm testing (using ADAS) to examine potential uptake and environmental benefits. This work is timed to end at the same time as the consultation on set-aside mitigation, so that decisions on the EnFER can be taken in light of final decisions on that issue.

On HLS, Natural England has now changed the basis on which agreements are offered, from a passive, mechanistic scoring system to a much more proactive, targeted approach. The broad targeting statements for Joint Character Areas, which had to be used with a scoring system have been replaced with much clearer statements setting out what HLS agreements should deliver. These are available on the Natural England website. This has been done for specific target areas, where we expect to find the greatest potential for HLS agreements that can deliver across the range of HLS objectives (landscape, biodiversity, resource protection, access and the historic

environment), and for other farms outside the target areas, where it is more likely that HLS agreements will be focussed on a particular outcome. The feedback we have received is that this new, more proactive approach is welcomed, as it provides a much simpler and clearer indication of what an HLS agreement will require.

## **8. The Roadmap Targets**

The dairy sector has come a long way in recent years in reducing its environmental impact, achieved by adapting farming practices to deliver environmental and economic benefits. However, it is evident that there is more that can be done. In setting targets for the industry there must be an existing baseline from which performance can be benchmarked, monitored and improved upon. This also requires the ability to accurately measure performance. As set out in the document, there are areas where specific targets and figures can be applied and measured, for example fertiliser usage, nutrient levels, pollution incidents and entry into Environmental Stewardship Schemes. However, there remain important areas where measurability of performance is more complicated. At present, there is little or no conflicting data available and an absence of a sophisticated methodology for measuring and monitoring environmental performance, the most significant of which being the ability to measure the dairy sector's contribution to GHG emissions.

The targets outlined below are presented with an estimation of the current baseline data (where available), a brief description as to how the target might be achieved, how and if performance can be measured and an acknowledgement of any limitations to achievement.

For the processing sector, the targets refer to the sector as a whole. For all targets flexibility may need to be exercised to take into account the circumstances, including product mix and baseline at each processing site. The aim of achieving overall reductions in environmental impacts should never be over-ridden by the need to achieve individual targets.

### **Short Term Actions: by 2010**

<b>Who?</b>	<b>Target</b>	<b>Current Level</b>	<b>How?</b>	<b>Measure</b>	<b>Limitation</b>
<b>Producers</b>	50% of dairy managed farmland entered into Environmental Stewardship Schemes	35% (estimated)	Continued promotion of the scheme and its benefits	Request that Defra records farm type in future ESS data collection	Options available will help/hinder uptake. Natural England are currently examining the ways in which the benefits of management plans might be captured in future
	5- 15% reduction in water usage per litre of milk	Varies per farm. This target reflects	Reducing waste of water and	Water auditing results / DairyCo	Water usage can only be reduced to

		the little extra reduction possible for some of the most efficient producers and a high reduction for people who are not already efficient.	improving efficiency by auditing and seeking opportunities for water re-use such as rainwater harvesting, use of 'green water'.	water use survey of Extension Groups	levels which do not compromise standards of animal welfare standards or hygiene
65% dairy farmers actively nutrient planning	The NFU and AIC are conducting a survey of grassland farmers in summer 2008 to establish a baseline for the number of farmers actively nutrient planning. Under the revised NVZ Action Programme 65% of milk quota is within an NVZ and this forms the basis of the present target for nutrient planning.	Compliance with revised NVZ Action programme and continued development of nutrient planning tools and materials and communication of benefits	Reduced levels of N in watercourses and numbers of farmers with a nutrient management plan	Farmers may be reluctant to adopt nutrient planning unless they can see a direct economic benefit to doing so.	
30 dairy farms piloting on-farm Anaerobic Digestion	Only a small number of case studies are available on dairy farmers who have invested in this technology	Clear communication and information disseminated to farmers about AD, including finance, installation, planning and benefits	Record and collate case studies. Explore potential for industry survey	Huge capital investment required and only currently suited to large dairy units.	
100% dairy farmers, through	Dairy farmers	R&D has been	Dairy Co to	Competing	

DairyCo, supporting research into new technologies	already support and encourage new research, funded by farmer levy	identified as a clear priority under new Dairy Co Business Plan	provide updates to industry on latest research developments and trials	pressures on DairyCo's budget.
95% of producers have a manure management plan	Current requirement of Assured Dairy Farm Scheme. Current compliance rate is between 88-90%	Promote the benefits of waste management and ensure total compliance	ADF inspection records and numbers of non-conformances	Data sharing
95% of producers have Farm Health Plans	Current requirement of Assured Dairy Farm Scheme - not achieved total compliance and/or full utilisation of plans	Promote the benefits of pro-active farm health planning, educate producers and explore performance based outcomes	ADF Inspection records and number of non-compliances	Data sharing, indicators / measurability of health
<b>Processors</b>	All processors will meet or beat energy and CO2 reductions of the sector Climate Change Agreement.			
	Dairy UK will operate an environmental benchmarking and best practice performance programme and will publish an annual sustainability report providing evidence of progress towards targets.			
	A minimum of 10% recycled UK HDPE in milk bottles			
<b>Retailers</b>	All major multiple retailers should establish positive, direct (where appropriate) relationships with producers (farmers) and processors. The objectives of these relationships are to improve transparency in the supply chain, communication and efficiency. Agree initiatives to add value and support the delivery of the targets for producers and processors in the Roadmap.			
	All major retailers should recognise the work of the Roadmap and, where possible, incorporate targets within their own Corporate Responsibility Targets covering points such as carbon emissions, reduction in energy use, reduction in water use and reduction in waste going to landfill (not an exhaustive list)			
	All major retailers should consider the use of technological interventions to reduce CO2 emissions associated with transport of liquid milk			
Retailers should support supply chain delivery of environmental benefits by reinforcing positive environmental messages for milk through product placement and point of sale information.				

<b>Medium Term Actions: by 2015</b>					
<b>Who?</b>	<b>Target</b>	<b>Current Level</b>	<b>How?</b>	<b>Measure</b>	<b>Limitation</b>
<b>Producers</b>	65% of dairy managed farmland entered into Environmental Stewardship Schemes	35% increasing to 50% by 2012 (estimated)	Continued promotion of the scheme and its benefits	Request that Defra records farm type in future ESS data collection	Options available will help/hinder uptake.
	90% of producers have nutrient management plans in place	45% increasing to 65% by 2015 (estimated) with a goal for the majority of producers to be engaged in Nutrient Planning	Compliance with revised NVZ Action programme and continued development of nutrient planning tools and materials and communication of benefits		
	20-30% of producers trialling new technologies to reduce emissions from cattle (including for example improved slurry and manure management, feeding efficiency and techniques, and genetics)	DairyCo currently researching effective ruminant nutrition regimes that reduce the production of Methane and ammonia.	Encouraging farmer participation in trials	Currently, this means approximately 3000 dairy farmers engaging in new technologies. This will be monitored by DairyCo by surveys of 100 dairy discussion groups	Dependent on investment in R&D and advances in feeding technologies as well as impact on dairy cow yields / performance
	Continued declining trend in serious pollution incidents on	Reduced by 35% in 2006-7 to lowest	Better management of pollution risks on-	Environment Agency Data	

	<p>farm</p> <p>Dairy farmers encouraged to calculate the carbon footprint of the farm</p>	<p>ever level</p> <p>No consistent industry available at present, although in development</p>	<p>farm</p> <p>Retailers working with producers, rewarding farmers for calculating and reducing their carbon footprints</p>	<p>Retail dedicated producer data</p>	<p>Dependent on incentives for farmers to calculate carbon footprint, greater industry understanding and awareness of carbon foot printing and development of a consistent, industry agreed methodology</p>
<p><b>Processors</b></p>	<p>Dairy farmers to improve energy efficiency by 15% by 2010</p>				
	<p>Every major liquid milk processing company will have in place an Environmental Management System (EMS) covering carbon, energy, water, effluent, waste, packaging, with large progressing to an externally certified/verified EMS by this milestone. Dairy UK will encourage small and medium-sized companies to adopt EMS.</p>				
	<p>SMEs investigating environmental management systems</p>				
	<p>Every liquid milk processing site with gas-fired boilers over 2MW will use low NOx burners.</p>				
	<p>All processors will meet or beat energy and CO2 reductions of the sector Climate Change Agreement.</p>				
	<p>All large liquid milk processing sites will carry out benchmarking of Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) discharged per tonne of product.</p>				
	<p>The COD load in discharged effluent will be reduced by 20% at all liquid milk processing sites.</p>				
	<p>Large processors will undertake benchmarking of energy efficiency – CO2 emissions and energy (kWh) relative per tonne of finished product.</p>				
	<p>Dairy UK will work with dairy companies to develop if feasible three fully operational Centralised Anaerobic Digesters at processing sites, with at least one of these being a liquid milk operation.</p>				
	<p>10% of non-transport energy use to come from renewable sources or Combined Heat &amp; Power/Tri-Generation systems for large processors.</p>				
	<p>To send zero ex-factory waste to landfill where environmentally advantageous for all large processing sites.</p>				
	<p>Large processors to achieve an absolute reduction in water use of 20% through increased water reuse and recycling against a 2007 baseline.</p>				
	<p>To achieve an average water use volume to product volume ratio of 0.5 (2007 best practice) at large liquid milk</p>				

	processing sites where environmentally appropriate. Estimated water saving of 4.2 billion litres per year, based on the average ratio for large processing sites of 1.1.
	All large liquid milk sites will implement a carbon management programme (This represents over 90% of production).
	There will be no direct discharges of polluting substances to groundwater.
	Minimum of 30% recycled material in packaging materials
<b>Retailers</b>	Retailers should look to reduce emissions from existing retail stores – including new refrigeration technology and interventions All major retailers should explore options to increase the amount of recyclate used, and encourage recyclability, in product packaging from a 2007 baseline to close the recycling loop. They should also invest in ways to recover materials from their customers to achieve this.

### Long Term Actions: by 2020

Who?	Target	Current Level	How?	Measure	Limitation
<b>Producers</b>	20 - 30% reduction in GHG (carbon equivalents including Co2, CH4, N2O) balance from dairy farms between 1990 and 2020	Methane emissions have fallen by 13.5% since 1990. Carbon emissions have fallen by 23% since 2000 through improved efficiencies at the point of Nitrogen fertiliser production <sup>3</sup>	New technologies, improved yields, greater longevity to reduce culling rates and breeding of replacements	Currently no industry agreed calculation for GHGs. This figure builds on current performance and is in line with international Kyoto targets	Currently, only those mitigation methods that involve a reduction in number of animals register as a reduction on the enteric fermentation inventory. A more inclusive and comprehensive inventory calculation is required.
	70% of non-natural waste is recycled or recovered as standard practice	Aspirational target subject to change following publication of Producer Responsibility and targets	Through compliance with Agricultural Waste Regs and enabled by the introduction of Producer	Compliance with PR scheme and Waste Regulations – Defra monitored	Lack of suitable recycling infrastructure and certain types of material (e.g. material fertiliser and

<sup>3</sup> British Survey of Fertiliser Practice Survey 1995-2005

		following a review of progress before 2020.	Responsibility Scheme		feed/seed bags, veterinary medicines and animal health products, baler twine & net wrap) are not recyclable and have to be sent to land fill.
	40% of energy used on dairy farms is from renewable sources	This is in line with the Government's commitment to generate 11-15% of the UK's energy from renewable sources, as a contribution to an EU target of 20%.	Generation of energy on farm through Combined Heat and Power installations, Anaerobic Digesters.	Government performance targets on Renewable Energy and NFU member information	
<b>Processors</b>	To send zero ex-factory waste to landfill.				
	All processors will meet or beat energy and CO2 reductions of the sector Climate Change Agreement.				
	Large processors will achieve an absolute reduction in water use of 30% through increased water reuse and recycling against a 2007 baseline (small processors to achieve a 20% reduction).				
	50% recycled material will be used in packaging materials				
	All tertiary packaging is to be re-usable or recyclable				
	Dairy UK will work with dairy companies to extend where feasible Centralised Anaerobic Digesters at processing sites.				
	Environmental management systems will be in operation at all sites				
	SMEs will be achieving the medium term targets				
	Processors will reduce transport emissions per litre of milk by optimisation or vehicles and transport routes.				
	Dairy UK will be publishing environmental management reports giving the environmental performance for the whole dairy sector.				
	10% of non-transport energy use to come from renewable sources or Combined Heat & Power/Tri-Generation systems for all processors.				
	All liquid milk processing sites will implement a carbon management programme.				
	All processors to undertake benchmarking of energy efficiency in terms of CO <sub>2</sub> emissions and energy (kWh) relative per tonne of finished product.				

	<p>All liquid milk processing sites will carry out benchmarking of Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) discharged per tonne of product.</p> <p>The COD load in discharged effluent will be reduced by 20% at all liquid milk processing sites.</p> <p>To achieve an average water use volume to product volume ratio of 0.5 at liquid milk processing sites where environmentally appropriate. Note that the 0.5 ratio is the best performance of a processor as determined by benchmarking in 2007, with the industry average for all processors approximately 1.3. This would provide a saving of approximately 5.6 billion litres of water per year.</p>
<p><b>Retailers</b></p>	<p>Retailers should make visible commitments to support environmental achievements by their suppliers</p> <p>Retailers should make a commitment that all new stores built between now and 2020 will emit less carbon than an equivalent store in 2006.</p>

## Annex - Glossary of Terms

Agricultural Waste Regulations	Regulations to manage waste produced on farm
AIC	Agricultural Industries Confederation
Anaerobic Digestion	Process in which microorganisms break down biodegradable material in the absence of oxygen, producing predominantly methane gas, which can be used as a fuel, and a digestate that can be used as a fertilizer.
Assured Dairy Farms	Farms under the National Dairy Farm Assured Scheme (NDFAS) that follow guidelines and meet that standards set on the production methods and the safety and quality of milk leaving the premises
BAP	Biodiversity Action Plan
BCVA	British Cattle Veterinary Association
Biochemical Oxygen Demand (BOD)	A measure of the amount of oxygen consumed by micro-organisms in breaking down a pollutant (usually in water or waste water)
Biofuels	Fuel derived from a plant or animal origin
Biomass boilers	Boilers that use 'biomass' (organic matter of recent origin) rather than fossil fuels.
CAP	Common Agricultural Policy
Cattle Health Initiative (CHI)	One of four linked Cattle Health Planning Projects which provides health planning services to 100 dairy and 100 beef farms across England
Chemical Oxygen Demand (COD)	A measure of the oxygen-consuming capacity of both inorganic and organic matter (usually pollutants) present in water or wastewater.
CLA	Country, Land and Business Association
Cleaning in Place (CIP)	System designed for automatic cleaning and disinfection without major disassembly and assembly work
Climate Change Agreement (CCA)	Agreement which allows certain business users to receive a discount from the Climate Change Levy in return for meeting energy efficiency or carbon saving targets.
CSR	Corporate Social Responsibility
Dairy Supply Chain Forum (DSCF)	Established in July 2002 to help address some of the issues affecting the dairy sector raised by Sir Don Curry's Policy Commission. For further information: <a href="http://www.defra.gov.uk/foodrin/milk/documents/dscf-2003-2007.pdf">http://www.defra.gov.uk/foodrin/milk/documents/dscf-2003-2007.pdf</a>

DairyCo	Milk Development Council before 1 April 2008
Dairy UK	Trade organisation representing processors and distributors of liquid milk and dairy products and milk producer co-operatives
Defra	Department for Environment, Food and Rural Affairs
Digestate	Solid material remaining after the anaerobic digestion of a biodegradable feedstock
EA	Environment Agency
EBLEX	English Beef and Lamb Executive
ECHAWG	English Cattle Health and Welfare Working Group
ELS	Entry Level Schemes
EMS	Environmental Management System
Enteric Fermentation	Fermentation in the digestive systems of ruminant animals
Environmental Plan for Dairy Farming	Joint industry Government initiative that encourages dairy farmers and their advisers to adopt straightforward approaches to reducing the environmental impact of dairy farming. The stakeholders involved are National Farmers Union, Dairy Co, Environment Agency, Dairy UK, Royal Association of British Dairy Farmers, natural England and Welsh Assembly Government
ESA	Environmentally Sensitive Areas
FACTS	Fertiliser Advisers Certification and Training Scheme
Farm Health Planning	Industry led initiative funded by Defra and part of the GB wide Animal Health and Welfare Strategy
FAWC	Farm Animal Welfare Council
FWAG	Farming and Wildlife Advisory Group
Grass +	Online resource designed to reduce the costs of milk production through grass and environmental management best practice.
Greenhouse Gas Balance	A GHG Balance takes account of the emissions debits and credits from farming systems. Debits include emissions from manures, livestock and energy used in buildings, field operations and transport. Credits include the generation of renewable energy, the energy offset against other products from the farm such as calves and cull cows and reduction in emissions from enhanced energy and feed efficiency. This methodology enables farmers to reduce their overall emissions balance, while maintaining the flexibility to increase the size of their herd and farm business.
Greenhouse Gases (GHG)	Gases that come from both natural sources and human activity and contribute to the Greenhouse Effect (by trapping the Earth's heat in the atmosphere) – water vapour, carbon dioxide, methane, nitrous oxide, ozone and CFCs.
HDPE	High Density Polyethylene

IGD	Provides food and grocery information, insight and best practice
IPPC	Regulatory system to control the environmental impacts of certain industrial activities through a single permit process.
ISO14001	International specification for an independently certified environmental management system
K	Potassium
Kyoto	Protocol to the International Framework Convention on Climate Change with the overall aim of reducing greenhouse gases
LEAF	Organisation "Linking Environment and Farming"
Life-Cycle Analysis (LCA)	An investigation into the impacts from a material or product carried out by examining the complete and progressive stages in its origin, processes it goes through, and its final state.
MDC	Milk Development Council (DairyCo as of 1 April 2008)
Methane	Colourless, odourless gas commonly used as a fuel (natural gas). It is one of the basket of greenhouse gases (along with carbon dioxide and nitrous oxide)
Milk Quotas	Limits on milk production by Member State, administered by the European Union.
MLC	Meat and Livestock Commission
N	Nitrogen
NFU	National Farmers' Union
NIRS	Nuclear Information Resource Service
Nitrous Oxide	Colourless non-flammable greenhouse gas
NVZ	Nitrate Vulnerable Zone/s
P	Phosphorus
PAS 2050	Publicly Available Specification for developing a standard Carbon methodology being jointly developed by Defra and the Carbon Trust
rHDPE	Recycled High Density Polyethylene
River Basin Management Plans	Required under the Water Framework Directive to summarise how the River Basin District will be managed over the plan period (includes measures for delivering environmental improvements)
Roadmap	A Roadmap uses life cycle analysis to complete a 'cradle to grave' picture of the environmental impacts for a product and highlight areas where efforts can effectively be concentrated to reduce those impacts.
Royal Association of British Dairy Farmers (RABDF)	Independent, specialist sectoral body dedicated to representing the interests of practical British dairy farmers
Rumen	A ruminant animal (cattle or sheep) has 4 stomachs the largest of which is the rumen which allows for cellulose to be broken down by bacteria
SPS	Single Payment Scheme

Tallow	Rendered form of beef or mutton fat
Tenant Farmers' Association (TFA)	Organisation dedicated to the agricultural tenanted sector and the authentic voice on behalf of tenant farmers
Volatile Organic Compound (VOC)	Organic chemical compounds that vaporize and enter the atmosphere under normal conditions
Voluntary Modulation	The transfer of funds from farming subsidies in the first pillar of the CAP to Rural Development Schemes
Water Framework Directive	European legislation designed to improve and integrate the way water bodies are managed throughout Europe
WRAP	Waste and Resources Action Programme

