



DAIRY PROCESSING SECTOR PLAN

June 2019

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Preface

SEPA has a strong track record of regulating to improve the Scottish environment. We are proud of what we have achieved since we were set up just over two decades ago in 1996. We know we need to do more over the next two decades to build on this success. Much more.

The mounting scientific evidence about climate change, plastics in our oceans, the pressure on our freshwater and more, shows us that humanity must rise to tackle major environmental challenges. This scientific knowledge underpins SEPA's strategy for how we will regulate – One Planet Prosperity. If everyone in the world lived as we do in Scotland, we would need three planets. There is only one.

So, we will regulate to help Scotland prosper within the means of our one planet. Successful businesses in future will be those that use low amounts of water, materials and carbon-based energy and create little waste. Prosperous societies will be comprised of these businesses. This can be Scotland.

In every sector we regulate, this means we will have two simple aims. We will:

1. ensure that all businesses fully meet their environmental compliance obligations;
2. help as many businesses as possible to move beyond environmental compliance obligations.

This sector plan outlines how we will do this in regulating the dairy processing sector.

Dairy processing turns Scottish farm produce into products that are sold in domestic and export markets. It is a sector that has a good record of compliance with Scotland's environment protection laws. Opportunities exist to drive further significant reductions in energy, water and materials use throughout the sector's operations. Importantly, these reductions should also generate economic and social gains.

We are determined to ensure this solid compliance performance is entrenched and that we play our role in supporting the opportunities for beyond compliance improvements. This is why this sector plan is important as it maps out how we plan to do this work. Our plan is ambitious. It spells out how we will use traditional environmental protection agency (EPA) regulatory tools, such as permits and enforcement, in clearer and more powerful ways. It sets out some completely new ways, such as novel partnerships, that we will develop and use to support innovation in this sector.

Terry A'Hearn

SEPA Chief Executive Officer

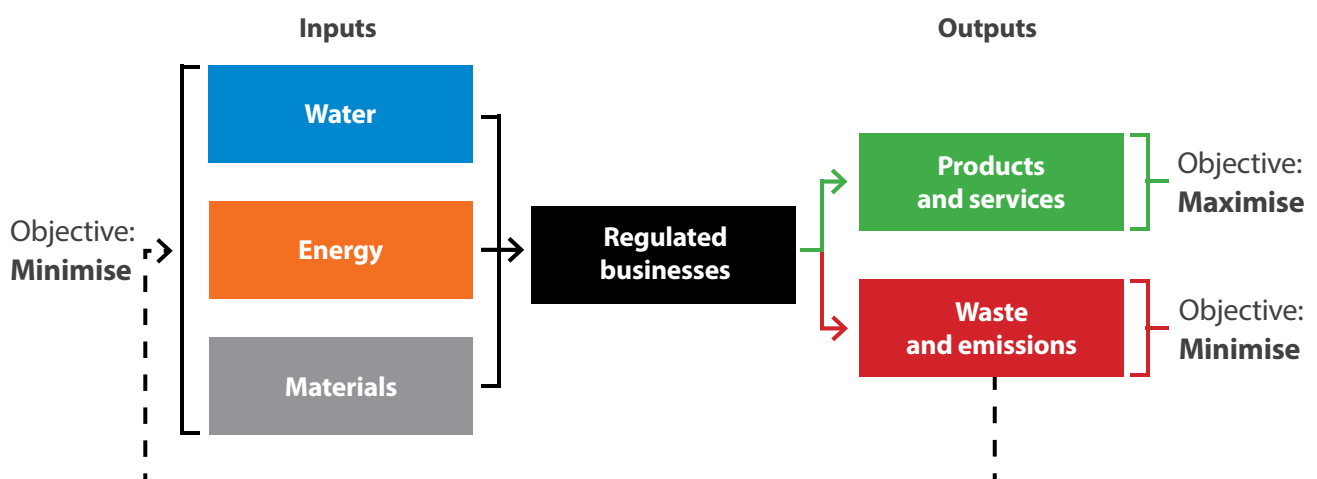
1. Introduction

SEPA's statutory purpose is to protect and improve the environment in ways that, as far as possible, create health and wellbeing benefits and sustainable economic growth. To help create a prosperous Scotland that lives within the means of our one planet, we need to radically change the way we work. In the past our approach to regulation has been grounded in different sets of rules to protect the environment. This has helped us to deliver, for example, improvements in water quality. However, it will not enable us to make the transformational changes needed to tackle today's problems.

We are moving instead to ground our approach to regulation by working across whole sectors. In this way we can systematically identify the compliance issues that need to be tackled by the sector. However, mere compliance and small scale incremental change will not be enough. We want to help businesses and sectors to implement successful innovation and support them in their ambitions to do more than they are required to by regulation.

We call this **moving beyond compliance:** helping already high performing businesses to do more for the environment because it makes sense for them to grow in a sustainable manner. Many businesses in the dairy processing sector are already moving beyond compliance, for example by implementing best practices to improve water use efficiency, reduce food waste, increase the use of low carbon energy sources and invest in their supply chains. We can also identify where the biggest opportunities are for us to help the sector to go beyond compliance. In both ways this will help regulated businesses operate successfully within the means of one planet.

Environmental flows (Figure 1)



Within this plan the references to moving beyond compliance refer simply to activities that operators might choose to take for business reasons that benefit the environment and go beyond the legal minimum for environmental protection. Beyond compliance activities are entirely voluntary. For example, most operators already undertake measures to reduce their energy usage and waste production and, as a result, reduce costs, increase income and improve the long term viability of their business. This plan explores opportunities for SEPA to help dairy processors choose to practice additional 'beyond compliance' activities of this kind and thereby improve their business viability while also benefitting the environment.

All businesses that we regulate in a sector use water, energy and raw materials to produce the products and services they sell. In doing so, they also create waste and emissions. We can think of these as environmental flows that need to be managed by the business (Figure 1).

We want to help as many businesses as possible to manage these flows effectively. Reducing their use of natural resources and reducing the creation of waste, will enable them to meet their legal obligations, drive further improvements and operate their business successfully. To facilitate this, we are preparing sector plans for every sector that we regulate.

Sector plans are at the heart of everything we do, shaping the interactions with every sector and the businesses in them. Through them, operators will get the relationship that their attitude and performance earns. Those that demonstrate a commitment to good environmental

performance and to delivering solid outcomes will receive powerful support through guidance and advice. Those that demonstrate behaviour which leads to significant or chronic non-compliance can expect SEPA to use the most appropriate enforcement tools to bring them into compliance.

Sector plans are strategic documents, their aims and aspirations will evolve over time. Implementation of the plans will take account of opportunities, for example, to work across different sectors, improve communications and develop partnerships. SEPA will also consider the relative corporate priority of different work areas.

This is our plan for the dairy processing sector. It details how we are going to regulate the sector and work with it to protect and improve the environment. The plan focuses on all aspects of dairy processing, starting when the milk leaves the bulk-tank (either to be transported to a processor or to be processed on the farm) and includes the impact of the processing of all dairy products, up to the point of sale or export. While the plan focuses on processing of cow's milk, many of the actions will be applicable to other milk types. The production of cow's milk is covered in our Dairy production sector plan¹.

The plan explains how we will work directly with operators and sites and includes ways that we will use our shared influence to improve environmental performance throughout the industry supply chain.

The Dairy Roadmap², which sets out the industry's own aspirations, is already moving processors in the sector beyond compliance; this plan will build on that momentum and identify how SEPA can drive beyond compliance activity.

¹ <https://sectors.sepa.org.uk/>

² Dairy UK: The Dairy Roadmap <https://www.dairyuk.org/the-dairy-roadmap/>



2. Our vision for the dairy processing sector

The dairy processing sector recognises that protecting the environment is fundamental to its success. This means that all resources are used carefully; energy comes from low carbon sources, waste is minimised and innovation is embraced to ensure that maximum value is extracted from all inputs and by-products.

Within their supply chain, dairy processors select milk and other ingredients, transport mechanisms and packaging materials that have minimal environmental impact. Dairy processors are valued members of, and contributors to, their local communities and they are resilient to the challenges of climate change. Consumers actively select dairy products based on their environmental credentials.

Environmental excellence in the sector will be driven by:

- **running more efficient processes and reducing packaging and fuel costs;**
- **developing strong provenance branding as a unique selling point for dairy products; this branding will rely on a high quality environment.**

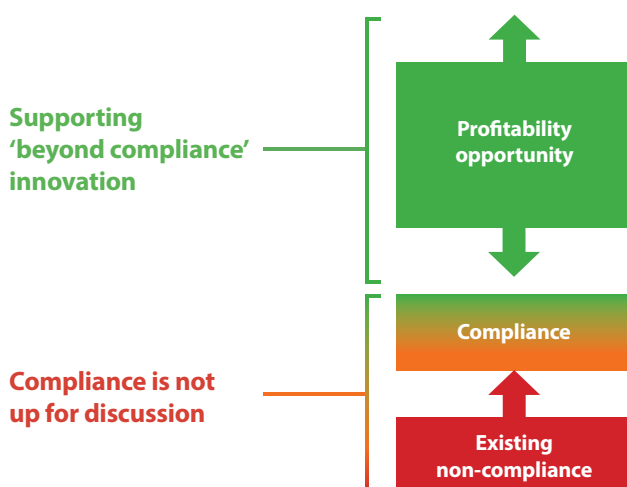
Our objectives

The objectives of the dairy processing sector plan are to:

- ensure that all businesses fully meet their environmental compliance obligations;
- help as many businesses as possible move beyond their environmental compliance obligations

This is illustrated by the sector roadmap (Figure 2):

Sector roadmap (Figure 2)



This sector plan sets out how we will work with the dairy processing sector. For our vision and objectives to be achieved we will work with partners and facilitate liaison between them and the dairy processing sector to create opportunities that link business success with environmental success.

As well as helping businesses to reduce their impacts on the environment, SEPA's sector plans will deliver the ambitions set out in many SEPA and Scottish Government policy frameworks and strategies including the river basin management plans³, the Waste to Resources Framework⁴, the Energy Framework⁵, the Climate Change Commitment Statement⁶ and the Flood Risk Management Strategies⁷. We want to bring together skilled, experienced and innovative people from across the sector to understand key challenges and opportunities to create innovative solutions. If we get this right, it will mean that the environment is not seen as a constraint, but a platform on which economic and social success can be built, putting the dairy processing sector on a pathway to becoming a 'one planet' sector.

³ <https://www.sepa.org.uk/environment/water/river-basin-management-planning/the-current-plans/>

⁴ <https://www.sepa.org.uk/media/219528/one-planet-prosperity-a-waste-to-resources-framework.pdf>

⁵ https://www.sepa.org.uk/media/383806/sepa_energy_framework.pdf

⁶ <https://www.sepa.org.uk/media/369292/climate-change-commitment-statement.pdf>

⁷ <http://apps.sepa.org.uk/frmstrategies/>



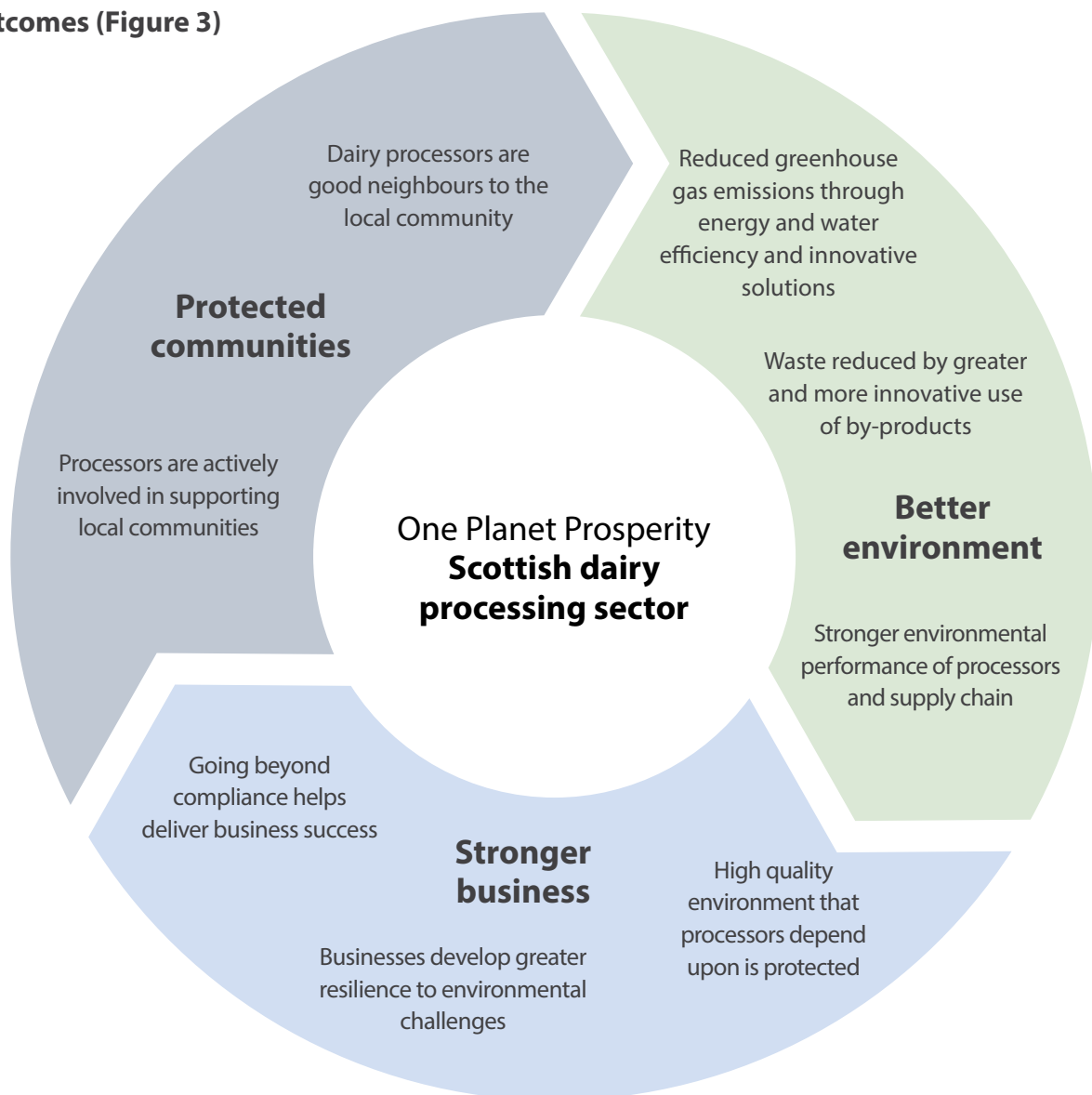
3. Outcomes

If we achieve the vision we have set out in this plan, we expect that we will help to:

- **protect and improve the environment;**
- **protect communities;**
- **further enable businesses to operate effectively and successfully in their markets.**

The figure below shows the outcomes we would like to help the dairy processing sector achieve. These are linked to actions that we will take as outlined in Section 7 of the plan and all contribute towards achieving United Nations (UN) Sustainable Development Goals and targets set in the Scottish National Performance Framework⁸.

Outcomes (Figure 3)



⁸ <https://nationalperformance.gov.scot/>



4. The dairy processing sector

Approximately 1.4 billion litres of raw milk were processed in Scotland during 2015–2016⁹. It is important to acknowledge that each year there is movement of milk between Scotland and England, depending on prices and businesses' decisions. Processors in Scotland make a range of dairy products from liquid milk, including cheese, butter, ice cream and yoghurt. They also produce bulk ingredients for further processing outside Scotland into products such as chocolate and spreadable cheese.

Processing sites range in size from on-farm processors producing artisan products, to multinational companies operating industrial-scale processing, distribution and export of products.

In 2017, Scottish dairy products contributed £218 million to Scottish Gross Value Added (GVA), representing 6% of the Scottish food and drink manufacturing GVA¹⁰.

The dairy industry in Scotland, like the rest of the UK dairy industry, is heavily reliant on the domestic market with around 92% of Scottish dairy products being sold in the UK¹¹.

Most of the dairy supply chain greenhouse gas emissions are incurred in producing milk, i.e. dairy farming. Total cradle-to-grave dairy supply chain emissions amount to around 3% of Scotland's direct greenhouse gas emissions, with 14% of that coming from emissions associated with dairy processing, transport and retail of dairy products¹².

Each year the UK generates 389,000 tonnes of dairy food waste¹³ with over two thirds of this attributed to liquid milk waste. The majority of this is produced within households, with approximately 13,000 tonnes of waste per year attributed to milk processing and bottle filling¹⁴.

Dairy waste volumes vary depending on the processing methods and product being made. For example, it can take around 10 kg of milk to make 1 kg of a hard cheese like cheddar. This leaves almost 9 kg of whey and 0.5 kg of cream. Currently, whey and other dairy processing residues are either used in biogas, fed to animals, applied to land as a fertiliser, or discarded. There are opportunities for processors to recover more value from this material and for dairy food wastes to be reduced.

Nearly three billion HDPE plastic milk¹⁵ bottles are used every year in the UK contributing a significant proportion of the plastic waste stream. HDPE milk bottles are one of the most widely recycled household items and have higher recycling rates than other types of plastic packaging. HDPE milk bottles are also lighter and contain more recycled material than in earlier designs.

Dairy processors make a range of other products, some consumed directly from the container and on the go. There is less evidence that these containers are captured for recycling¹⁶. There are a range of other packaging options available for dairy products, including reusable containers.

⁹ <https://www2.gov.scot/Resource/0053/00536754.xlsx> & AHDB (2017) Market Intelligence, November 2017, p18

¹⁰ Scottish Government: Agricultural facts and figures 2018

¹¹ Scottish Dairy Review: Ambition 2025

¹² Scottish Dairy Supply Chain Greenhouse Gas Emissions: Main Project Report

¹³ <http://www.wrap.org.uk/sites/files/wrap/Household%20food%20waste%20restated%20data%202007-2015%20FINAL.pdf> on p66

¹⁴ <http://www.wrap.org.uk/content/quantification-food-surplus-waste-and-related-materials-supply-chain>

¹⁵ <https://www.dairyuk.org/wp-content/uploads/2018/10/The-Dairy-Roadmap-2018.pdf>

¹⁶ Scottish Government consultation: A Deposit Return Scheme for Scotland

Key facts and figures about the dairy processing sector¹⁷ (Figure 4)



9 litres

Liquid whey produced in making 1 kg of cheese



1.4 billion litres

The amount of milk processed in Scotland per year



218 million

The value of the Industry to the Scottish economy in 2017



31,000 tonnes

Amount of milk wasted in Scottish households each year



430%

Increase in yoghurt consumption in the UK, from the 1970s to now



41%

Cheese accounts for around 40% of dairy production in Scotland



9 litres

Annual ice cream consumption in the UK, per person



5.7 litres

The amount of water used to produce 1 kg of cheese



5

The number of large scale processing plants licenced by SEPA

¹⁷ Liquid whey: [The ultimate guide: Managing food waste in cheese manufacturing \(resource Efficient Scotland guide\)](#)
Milk processing: <https://www2.gov.scot/Resource/0053/00536754.xlsx> & AHDB (2017) Market Intelligence, November 2017, p18
Value to Scottish economy: [Scottish Government Agricultural facts and figures 2018](#)
Waste: [WRAP report: Opportunities to Reduce Waste along the Journey of Milk, from Dairy to Home](#)
Yoghurt consumption: [The Dairy Council Yoghurt factsheet](#)
Cheese production: 2012 figures ([AHDB Dairy report: Milk Utilisation Scotland](#))
Ice cream consumption: [Ice Cream Alliance: Facts about ice cream](#)
Water use: [Benchmarking water use in dairies \(report WRAP website\)](#)





5. Potential environmental impacts and how they are managed

Potential environmental impacts throughout the supply chain

Overview of environmental impacts associated with dairy processing (Figure 5)

Ingredients and materials

Impacts from production of milk and other raw materials (e.g. fruit and sugar) include:

- impacts on water quality from rural diffuse pollution;
- impacts on soil quality and structure from agricultural practices;
- greenhouse gas emissions and impacts on air quality.

See [Dairy production and Crop production sector plans](#)

Processing and maturation

- greenhouse gas emissions from transport of raw milk;
- impacts on air quality from transport of raw milk and other ingredients;
- greenhouse gas emissions from energy use at processors:
 - refrigerating dairy products;
 - heating for pasteurisation and other processing steps.
- impacts on air quality from energy use at processing sites;
- impacts on river ecology or groundwater from controlled effluent discharges and accidental spillages;
- impacts on water quantity and ecology from abstraction of water for cooling;
- impacts on soil, water, climate and air quality from development of new dairy processing sites;
- impacts from use of refrigerants with high global warming potential;
- impacts on water and air quality from the use of cleaning chemicals;
- greenhouse gas, soil, air and water emissions from [landfilling](#) of food waste and dairy process residues;
- impact on communities from noise and odour from sites;
- impacts on soil, water, climate and air quality from spreading of waste products.

Packaging

- greenhouse gas emissions, water and air quality impacts associated with manufacture, printing and transport of packaging;
- impacts on water quality and ecology from discharges of water and waste chemicals from washing reusable packaging;
- generation of micro plastics from manufacturing, recycling and disposal of plastic packaging.

Transport to market

- greenhouse gas emissions from transport of products to market;
- impacts from use of refrigerants in transport with high global warming potential;
- impacts on water, air and soil quality from transport to market, (e.g. micro plastics from [tyre wear](#).)

Environmental regulation of dairy processing sector

Not all dairy processing sites are required by law to be licensed by SEPA. We do regulate five large dairy processing sites in Scotland under section 6.8 of Pollution Prevention and Control (Scotland) Regulations 2012 (referred to as PPC). These sites are large industrial plants that process more than 200 tonnes of raw milk per day.

Their PPC permit requires them to use best available techniques (BAT) to reduce potential environmental impacts from their sites. As the dairy processing industry continues to develop, smaller sites may increase their processing capacity. If they reach the capacity threshold of 200 tonnes per day we will ensure that they are brought into PPC regulations.

Significant volumes of water are used at dairy processing sites; for example, a 2007 UK study¹⁸ found it typically takes 1.3 litres of water to process a litre of milk, though this figure has now reduced due to water efficiency work carried out by processors. We regulate a number of dairy processing sites for abstractions from, and discharges to, the water environment under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (referred to as CAR). In the most recent assessment (2017) there were seven CAR licences for dairy processing sites in Scotland.

Smaller scale, on-farm, dairy processing units do not require authorisation by SEPA. When a dairy farm also processes their milk on the farm, the sites often store and apply wastes to land under an exemption from the Waste Management Licensing (Scotland) Regulations 2011. Most dairy processors recognise waste as a resource and utilise by-products; this generates additional income and, if carried out properly, minimises the risk of pollution.

SEPA has registered a small number of exemptions from Waste Management Licensing (Scotland) Regulations 2011 for on-farm dairy processing sites. This allows them to apply the residues from dairy processing (which contain beneficial nutrients) to land. The material is stored and applied to land in addition to the slurry and manure from the farm. When deciding how to utilise dairy processing residues on the farm, dairy farmers have to take account of their farm nutrient budget and capacity to store the material.

The larger processors in Scotland are obliged to register with SEPA and fulfil prescribed recovery and recycling targets, under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007. These regulations encourage minimisation of packaging waste, as well as increased recycling.

Duty of care provides for the safe management of waste throughout the supply chain. It is a set of legal obligations¹⁹ that apply to everyone who produces or manages waste. Dairy processing businesses are required to take reasonable steps to ensure their waste is managed correctly through its complete journey to disposal or recovery. Businesses can find out more about their obligations, and get practical advice, by reading the Scottish Government's statutory guidance – *Duty of Care: A Code of Practice*²⁰.

Duty of care compliance promotes good environmental practice at all stages of the waste management chain. It ensures that waste goes to the right place, avoiding illegal disposal and environmental harm, and promotes high quality recycling. We will help businesses to understand their duty of care and make compliance as easy as possible. If businesses continue to disregard their duty of care we will take enforcement action that could include civil penalties or prosecution.

¹⁸ 2007 Dairy UK report

¹⁹ <https://www.legislation.gov.uk/ukpga/1990/43/section/34>

²⁰ <https://www2.gov.scot/resource/0040/00404095.pdf>

To reduce greenhouse gas emissions, some large dairy processing sites are regulated under the European Union Emissions Trading Scheme and under the Energy Saving Opportunity Scheme Regulations 2014 (referred to as ESOS). ESOS requires companies to undertake audits of energy usage across their business.

Dairy processing sites using refrigerants above a certain threshold are also regulated under the Fluorinated Greenhouse Gases Regulations 2015 and the Ozone-Depleting Substances Regulations 2015.

New processing facilities and expansions of existing sites are subject to control through the planning system. Planning authorities are responsible for making planning decisions and SEPA is a statutory consultee in this process.

In addition to the environmental regulation that is carried out by SEPA, there are strict requirements for premises that process dairy products to ensure the safety of our food and minimise the risk of harm to human health. As food producers, the dairy processing industry is primarily regulated by Food Standards Scotland and local authorities. Wastes from dairy processing activities, both on and off farm, are subject to Animal By-Products (Enforcement) (Scotland) Regulations 2013.

EU exit

Around 80% of environmental legislation in Scotland originates from the European Union. As the UK leaves the EU, environmental legislation is being corrected to make sure the law keeps working as it has been to ensure that the standards of environmental protection we enjoy today, and the principles upon which they are based are maintained. Therefore, while some of the detail of the legislation we use to regulate may change, our work to protect Scotland's environment will not. Our commitment to tackling non-compliance and to work with as many businesses as possible to help them to go further will not diminish as a result of the UK leaving the EU.

Wider influences on environmental performance of the dairy processing sector

Full compliance with environmental regulations will not, by itself deliver the transformational change required to secure our One Planet Prosperity objectives. The dairy processing sector plan needs to further unlock the potential for businesses to gain strengths in resource efficiency and environmental innovation that will help them to succeed in their markets.

To secure full compliance and help as many businesses as possible to move beyond compliance we will develop our relationships with partners and other stakeholders.

Figure 6 summarises the main organisations that influence and are influenced by operators in the dairy processing sector. It also identifies those that we may work with in both the short and longer term. As we implement the plan we will consider the opportunities these relationships provide and how we would like them to develop.

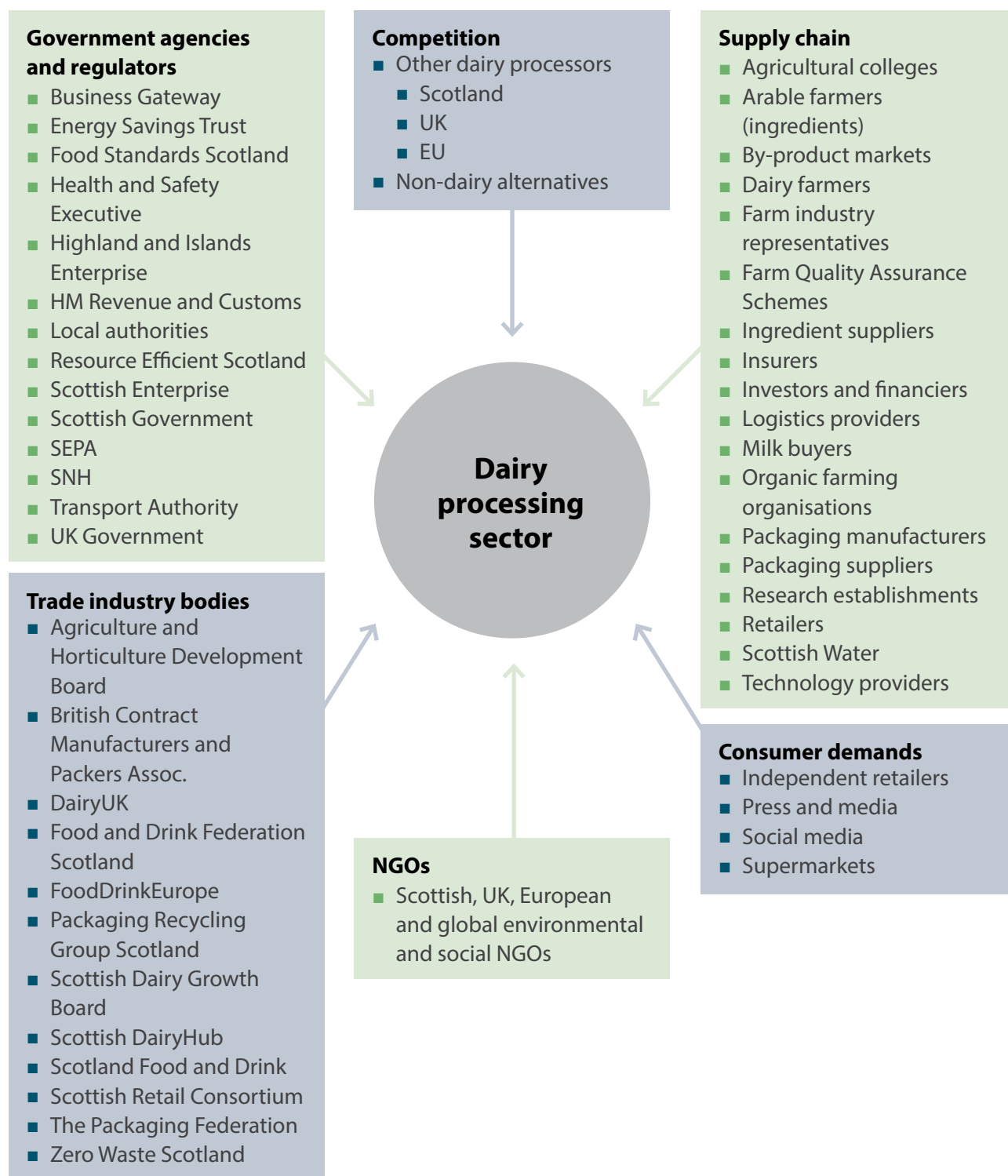
The Scotland Food and Drink Partnership has set out their vision for 2030. The Ambition 2030²¹ vision is for the Scottish farming, fishing, food and drink industry to be a world leader in responsible, profitable growth. Collaboration and innovation are key features of the vision, which aims to build on previous growth and increase the contribution of the food and drink sector to the Scottish economy.

²¹ [The Scotland Food and Drink Partnership Vision for 2030](#)

The Dairy Roadmap²² initiative brings together partners from across the dairy supply chain in the UK and challenges the industry to go beyond compliance and deliver environmental improvements. Those processors who signed-up made a commitment to set targets and to report on their progress to reduce the environmental footprint of the industry.

From the ambition of businesses to be self-sufficient in energy, installations of combined heat and power plant technology (CHP) and planning return delivery journeys to transport other materials, processors in Scotland have shown commitment to reducing their impact on the environment.

Key influences on the dairy processing sector (Figure 6)



22 Dairy UK: The Dairy Roadmap <https://www.dairyuk.org/the-dairy-roadmap/>





6. Tackling non-compliance and taking opportunities to go beyond

Compliance²³ with environmental law is non-negotiable and regulated businesses in the sector need to comply.

Compliance in the sector

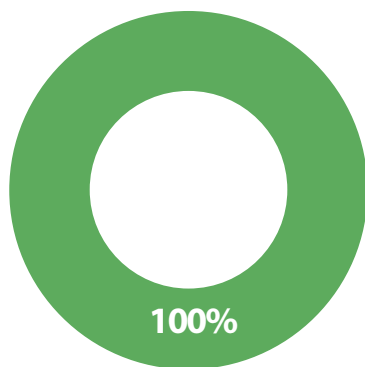
In the 2017 reporting year all licensed dairy processors were compliant with environmental regulations. Of these, seven sites had CAR licences, and 50% of those assessed were classed as 'excellent'. Of the five sites assessed under PPC regulations, 80% were classified as 'excellent'.

Some sites' overall compliance status was downgraded to good (rather than excellent) due to minor issues with missed deadlines for reporting and infrequent, low-level consent limit breaches.

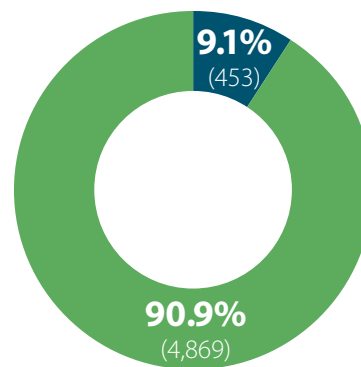
Of those businesses that have registered with SEPA under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007, in 2017 all were compliant with their obligations.

Compliance rate with environmental regulations in 2017 (Figure 7)

Compliance rate of licensed dairy processors



Average compliance with all licences that SEPA issues (for example, SEPA compliance assessment scheme (CAS) average 2017)



✓ Compliance ✗ Non-compliance

²³ Compliance with environmental authorisations is currently measured by our Compliance Assessment Scheme (CAS). This scheme is currently being reviewed.

We will help responsible compliant businesses to operate by making it significantly harder and more expensive for those who persistently fail to comply with environmental legislation to operate. We will achieve this by increasing scrutiny, prescription, fees and the use of enforcement and monetary penalties for those who fail to comply.

As the sector looks to develop processing activities, it will be important that environmental compliance remains high. Historically, there have been pollution incidents from unlicensed discharges and spillages to the water environment from dairy processing sites. Actions such as producing and implementing a water management plan could help to prevent these pollution issues arising, and help operators to avoid the unplanned shut-downs that might be associated with pollution incidents.

SEPA will:

- apply increasing scrutiny, prescription, fees and the use of enforcement and monetary penalties for those who fail to comply;
- ensure that all dairy processing sites that receive more than 200 tonnes of milk per day are brought into the Pollution Prevention and Control (Scotland) Regulations 2012;
- ensure that businesses are registered with Producer Responsibility Obligations (Packaging Waste) Regulations 2007, where appropriate;
- review permits and licences, as part of the Integrated Authorisation Framework, to reflect current legislation and changes to reference documents on best available techniques;
- invest in our staff so that they are well informed about the sector and can provide knowledgeable, consistent and pragmatic support.

Where are the opportunities to go further?

We believe that those societies and economies that are low resource use, low energy use, low water use and low waste will be the most successful in the 21st century. Businesses that are the most innovative will best rise to the challenges of our time, such as over use of resources and climate change and create sustainable economic growth.

In this section we describe opportunities and our aspirations to help businesses do more for the environment by building upon current good practices and choosing to move beyond compliance; because it makes sense for them to grow in a sustainable manner. Many of these opportunities will also help to improve compliance of businesses in the dairy processing sector.

Ambition 2030²⁴ sets out the vision for Scotland's food and drink industry; to be recognised as a world leader in responsible, profitable growth. The Scottish Dairy Review: Ambition 2025 describes how the Scottish dairy sector aims to achieve sustainable economic growth²⁵. This sector plan will help dairy processing businesses to identify opportunities to achieve this. Processors that are aware of their environmental footprint, who constantly reassess their opportunities and adopt a responsible, more circular approach to resource use are likely to flourish.

Some dairy processors in Scotland have previously agreed to voluntary environmental targets laid out in the Dairy Roadmap 2018²⁶. Other small and medium sized enterprises have also been keen to explore innovative ways of reducing environmental impacts as a way to add value to their brand.

Case study: The Courtauld Commitment 2025

[Courtauld 2025](#) is an ambitious voluntary agreement that brings together organisations across the food system – from producer to consumer – to make food and drink production and consumption more sustainable. At its heart is a ten-year commitment to identify priorities, develop solutions and implement changes to cut the carbon, water and waste associated with food & drink by at least one-fifth in 10 years.

There are dairy processors in Scotland that have signed up to this commitment. They have set objectives for improving water efficiency, reducing waste and greenhouse gas emissions across their businesses. Food and drink trade bodies along with Zero Waste Scotland and Scottish Government are working to help Scotland deliver reductions in food waste as part of this commitment.

²⁴ [The Scotland Food and Drink Partnership Vision for 2030](#)

²⁵ [The Scottish Dairy Review: Ambition 2025](#)

²⁶ [Dairy UK: The Dairy Roadmap](#)

Water

Water in the right place, in the right amount and of the right quality underpins Scotland's society and economy. Our water environment provides us with vital supplies for drinking and food production; supports business, industry and tourism; maintains places that benefit the health and wellbeing of communities and sustains wildlife.

Our sector plans aim to ensure we live and prosper within our environmental water limits, maximising the efficiency of its use, reducing the input of waste, creating better places for people to thrive, and protecting and restoring habitats for wildlife. By doing so, our plans will support and complement the ambitious targets set out in Scotland's river basin management plans (RBMPs) and flood risk management plans (FRMPs).

SEPA is committed to reducing the impacts of flooding. We have a central role in identifying and promoting the most sustainable actions to help deliver a flood resilient Scotland. We are developing a flood strategy that describes how we will work with partners to manage flood risk now and in the future. SEPA will continue to promote avoidance of flood risk as the priority. If risk can't be avoided then adaptation and defence is key. Where it is not possible to completely avoid or eliminate the flood risk then we will give communities and emergency responders advance notice of flooding to help them prepare and protect themselves. To understand areas at greatest flood risk, we will use the best available evidence. We will continue to work with partners to improve Scotland's FRMPs. Early and strong links between this sector plan and flooding will strengthen opportunities and necessitate engagement and communication between key partners.

The dairy processing industry uses water throughout production. Water is used to maintain a scrupulously clean processing plant, which is essential, not only for public health reasons, but also to reduce spoilage and waste of product.

There are opportunities to reduce water use, re-use water on site and recover residues from used water.

Case study

In line with the targets set in the Dairy Roadmap, UK dairy processors have achieved a 23% improvement in water efficiency as well as improvements in effluent quality²⁷.

SEPA's aspirations are to:

- work with businesses and advisors to investigate further opportunities to increase water use efficiency in the dairy processing sector;
- bring together experts in water innovation from across all business sectors to share experience and best-practice ideas;
- work with partners and industry bodies to develop and disseminate guidance on environmental opportunities for dairy processing businesses, including how to increase their resilience to climate change, flood risk and water scarcity.

²⁷ <https://www.dairyuk.org/wp-content/uploads/2018/10/The-Dairy-Roadmap-2018.pdf>

Energy

Energy is an essential resource that enables social and economic development and is one of the most important aspects of the transition to a sustainable low carbon economy. However, electricity and heat production, transmission, storage, and use can have significant environmental impacts. SEPA's Energy Framework²⁸ recognises that how we use and manage our energy resources is central to our ability to live within the resources of our planet. Cost savings and other benefits for businesses can be made by improving energy efficiency and making use of low carbon sources of energy.

Dairy processing uses a lot of energy; cooling, heating and refrigerating, and is an energy-intensive sector.

As with many industry sectors in Scotland, the reliance on fossil fuel powered heating and cooling is a significant part of their carbon footprint. In 2007, greenhouse gas emissions from energy, and transport made up 37% of the total greenhouse gas emissions from dairy processing, packaging, distribution and retail²⁹.

If milk is processed off-farm the sector depends on regular road transport to collect raw milk from the bulk tanks on dairy farms and deliver it to processing plants. Once processed, the products are moved, by road, to distribution centres and points of sale. Innovation, research and trials will be required across the industry spectrum to reduce the environmental impacts of the essential activity of moving materials and perishable products.

SEPA's aspirations are to:

- work with the industry and trade associations to review their energy targets to make a positive contribution to meeting Scotland's Energy Strategy targets;
- engage with businesses, trade organisations, advisors and research institutes to explore opportunities to minimise impacts associated with energy use within the sector, in line with the Clean Air for Scotland Strategy;
- explore opportunities to work with farm and business advice services and financial partners to encourage businesses to understand and actively manage their energy, water and materials use;
- work with dairy processors to phase-out the use of fluorinated gases with a high global warming potential in refrigerant systems.

Case study

Through the Dairy Roadmap, the industry has already achieved an 18% improvement in energy efficiency since 2008, and is committed to a target of 30% by 2025.

²⁸ https://www.sepa.org.uk/media/383806/sepa_energy_framework.pdf

²⁹ [Scottish Dairy Supply Chain Greenhouse Gas Emissions: Main Project Report](#)

Materials

SEPA views the circular economy as a game-changing opportunity to manage resources within planetary limits. Our Waste to Resources Framework³⁰ recognises that reducing the harms associated with waste management can create economic opportunities. We must dramatically cut waste production across the economy, recover more and dispose of only the very minimum. If waste is produced, we will encourage its productive use within a framework of strong environmental protection.

Resource efficiency can improve productivity and reduce costs for business. It can also bring environmental improvements and reduce our reliance on virgin raw materials.

Reducing waste

The business benefits of creating value from all dairy processing materials are clear, and many dairy processors have already worked to reduce waste in their processing lines.

Opportunities exist to recover greater value from dairy processing residues by creating valuable foodstuffs or energy. For example, whey can be a valuable by-product, which is currently discarded as waste by some cheese-makers.

When a dairy farm processes their milk on the farm, they often store and apply their processing wastes to land. These waste materials have high nutrient values, so it makes sense for processors to explore opportunities to use these in a way that maximises the income and minimises the risk of pollution.

SEPA's aspirations are to:

- work with businesses, trade bodies and funders to explore resource recovery opportunities from dairy processing residues;
- develop and implement a package of work within SEPA to investigate the use of residues and other materials as fertilisers/soil conditioners on land.

Case study: Value from food waste

It is estimated that waste costs food and drink processors approximately 4-5% of their turnover. Zero Waste Scotland has a focus on recovering products from food waste. They are promoting a mapping tool to help businesses get more value from their food and drink waste. The food waste valorisation programme will develop innovative solutions for wastes that will add economic value for businesses.

Case study

Dairy processor Nestlé achieved their goal of being zero waste to landfill from their Scottish factory in Girvan in 2010, five years ahead of target. The goal was part of their sustainability programme for their UK factories³¹.

Case study: Arla Foods

Dairy processor, Arla Foods, has introduced an ambitious target to reduce greenhouse gas emissions by 30% per kilo of milk over the next decade and to work towards net zero carbon emissions by 2050³².

³⁰ <https://www.sepa.org.uk/media/219528/one-planet-prosperity-a-waste-to-resources-framework.pdf>

³¹ <https://www.nestle.co.uk/media/pressreleases/nestlezerosinowasteingirvan>

³² <https://www.arla.com/company/news-and-press/2019/pressrelease/arla-foods-aims-for-carbon-net-zero-dairy-2845602/>

Packaging

Appropriate packaging of perishable foods is important to maximise shelf life and ensure the product reaches the consumer in good condition. HDPE packaging is commonly used and is readily recyclable.

Alternatives to plastic packaging for some dairy foodstuffs are also available. There has been an increase in the popularity of reusable packaging in small scale dairy processing operations. Innovative options are in development that will also help to reduce our reliance on single use plastics, for example, cheese wrappings made from milk protein rather than plastic. The Scottish Government is introducing a deposit return scheme, which targets the primary packaging materials with the aim of increasing the recycling rate.

SEPA's aspirations are to:

- continue to engage with the review of producer responsibility for packaging being undertaken by the Department for Environment, Food and Rural Affairs (Defra), and with the development and implementation of the Deposit Return Scheme for Scotland;
- develop our understanding of both the current and emerging product and packaging designs that help to prevent food waste that are available for dairy processing sites in Scotland;
- support the sector to eliminate unnecessary single use plastic, maximise recycled content and improve recyclability.

Case Study: Reusable containers

The use of reusable containers that can be delivered to retail outlets or filled from milk vending machines are gaining popularity as consumers aim to 'ditch the plastic'. Industry awards recognising innovation have encouraged small dairy processors in Scotland to drive sustainability in their business.

Mossgiel Milk³³ in Ayrshire have been recognised for their contribution to rural innovation and sustainability. The achievement of their business goal to be free from single-use plastic has been acknowledged by the dairy industry and also in the wider media.

33 <https://www.scottishlandandestates.co.uk/helping-it-happen/case-studies/mossgiel-family-farm-organic-farming-sustainable-future>

The future of dairy processing

Through Ambition 2030, the dairy processing sector intends to grow. This will be achieved by increasing the proportion of high-value dairy products, moving into new markets and new products and also by increasing production volumes.

Many processors are currently small-scale, and owned and operated by farm businesses. We anticipate that diversification into dairy processing will continue, with some processors increasing substantially in scale.

Successful dairy processors will be those that use low amounts of water, materials and carbon-based energy and create little waste.

SEPA's aspirations are to:

- review our planning responses for dairy processing sites to ensure that we deliver information that is useful and reflects One Planet Prosperity principles;
- explore opportunities to encourage investors to include dairy businesses' environmental sustainability in their investment decisions;
- engage with businesses and trade bodies to explore opportunities for processors to influence the delivery of actions in the Dairy production sector plan with their suppliers;
- support industry led, collaborative initiatives that will deliver business, environment and community success;
- invest in our staff so that they are well informed about the sector and can provide knowledgeable, consistent and pragmatic support;
- provide evidence that helps businesses to understand the key environmental risks and compliance issues in the sector.





7. Summary of actions and aspirations

The following table summarises the actions that we have described in previous sections to address non-compliance in the sector and aspirations to help businesses take opportunities to go beyond compliance. These are described according to the key outcomes introduced in Section 3 that we would like to achieve for this sector.

The table combines actions to address compliance and to help achieve beyond compliance. This is because the same action can often both improve compliance and help businesses to move beyond compliance. Similarly, actions that businesses choose to take to move beyond compliance can improve their compliance with environmental regulations.

We will prioritise them alongside those in other sector plans and progress powerful actions that contribute towards achieving our One Planet Prosperity goal for Scotland.

Better environment	
Outcome sought	Actions and aspirations
Reduced greenhouse gas emissions through energy and water efficiency and innovative solutions	<ul style="list-style-type: none">■ Work with the industry and trade associations to review their energy targets to make a positive contribution to meeting Scotland's Energy Strategy targets.■ Engage with businesses, trade organisations, advisors and research institutes to explore opportunities to minimise impacts associated with energy use within the sector, in line with the Clean Air for Scotland Strategy.■ Work with dairy processors to phase-out the use of fluorinated gases with a high global warming potential in refrigerant systems.■ Work with businesses and advisors to investigate opportunities to increase water use efficiency in the dairy processing sector.■ Bring together experts in water innovation from across all business sectors to share experience and best-practise ideas.

Better environment	
Outcome sought	Actions and aspirations
Waste reduced by greater and more innovative use of by products	<ul style="list-style-type: none"> ■ Work with businesses, trade bodies and funders to explore resource recovery opportunities from dairy processing residues. ■ Develop and implement a package of work within SEPA to investigate the use of residues and other materials as fertilisers/soil conditioners on land. ■ Continue to engage with the review of producer responsibility for packaging being undertaken by the Department for Environment, Food and Rural Affairs (Defra), and with the development and implementation of the Deposit Return Scheme for Scotland. ■ Develop our understanding of both the current and emerging product and packaging designs that help to prevent food waste that are available for dairy processing sites in Scotland. ■ Support the sector to eliminate unnecessary single use plastic, maximise recycled content and improve recyclability.
Stronger environmental performance of processors and supply chain	<ul style="list-style-type: none"> ■ Ensure that any new and enlarged sites processing more than 200 tonnes of milk per day are brought into the Pollution Prevention and Control (Scotland) Regulations 2012 permitting process. ■ Ensure that businesses are registered with Producer Responsibility Obligations (Packaging Waste) Regulations 2007, where appropriate. ■ Provide evidence that helps businesses to understand the key environmental risks and compliance issues in the sector.

Stronger business	
Outcome sought	Actions and aspirations
High quality environment that processors depend upon is protected	<ul style="list-style-type: none"> ■ Engage with businesses and trade bodies to explore opportunities for processors to influence the delivery of actions in the Dairy production sector plan with their suppliers. ■ Review our planning responses for dairy processing sites to ensure that we deliver information that is useful and reflects One Planet Prosperity principles.
Businesses develop greater resilience to environmental challenges	<ul style="list-style-type: none"> ■ Work with sector partner organisations to ensure the sector is resilient to climatic changes, especially around flood risk and water scarcity issues. ■ Work with partners and industry bodies to develop and disseminate guidance on environmental opportunities for dairy processing businesses, including how to increase their resilience to climate change, flood risk and water scarcity.
Going beyond compliance helps deliver business success	<ul style="list-style-type: none"> ■ Invest in our staff so that they are well informed about the sector and can provide knowledgeable, consistent and pragmatic support. ■ Explore opportunities to encourage investors to include dairy businesses' environmental sustainability in their investment decisions. ■ Explore opportunities to work with advice services and financial partners to encourage businesses to understand and actively manage their energy, water and materials use.
Protected communities	
Outcome sought	Actions and aspirations
Dairy processors are good neighbours to the local community	<ul style="list-style-type: none"> ■ Increase scrutiny, prescription, fees and the use of enforcement and monetary penalties for those who fail to comply. ■ Review permits and licences, as part of the Integrated Authorisation Framework, to reflect current legislation and changes to reference documents on best available techniques.
Processors are actively involved in supporting local communities	<ul style="list-style-type: none"> ■ Support industry led, collaborative initiatives that will deliver business, environment and community success.

