



# DAIRY PRODUCTION SECTOR PLAN

DRAFT FOR CONSULTATION

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## Why we are consulting

The draft sector plans are our initial ideas on where we can make the most significant impact. Getting feedback early in the process from our communities, partners and stakeholders is important and your feedback is critical to the success of our sector planning approach. If you think that we have got something wrong, missed a critical opportunity or not been as transparent as possible, please let us know your thoughts.

We aim to get these plans finalised in the first months of 2019 and then push on to implement them. Your views will also help to shape the prioritisation for the implementation, which will be completed following the consultation period.

The consultation is open until Friday 15 February 2019. Have your say, by completing the online consultation survey available from:

<https://consultation.sepa.org.uk/sector-plan/dairy-production>



**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.**

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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 ensure:

1. that every regulated business fully meets their compliance obligations;
2. as many regulated businesses as possible will go beyond the compliance standards.

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

Dairy production is an important sector in the Scottish economy. SEPA has developed a good working relationship with this sector over the past few years. Producers in this sector have made efforts to improve their environmental performance, but significant non-compliance challenges remain.

This draft plan spells out how we will use our established relationships to work hard to ensure the Dairy Production sector becomes compliant. Many opportunities for good practice and technology enhancement exist that will help the sector to make

further progress and, ultimately, go beyond compliance. SEPA is determined to assist the sector so we help create stronger businesses operating within the means of one planet.

This draft plan is ambitious. It sets 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.

We would love to hear what you think of our draft plan. Once it's finalised, we are going to push on and implement it. So if you think we've got something wrong, missed something out or not been as transparent as possible, please let us know your thoughts. We want to get this right and then get on with it.

**Terry A'Hearn**

SEPA Chief Executive Officer

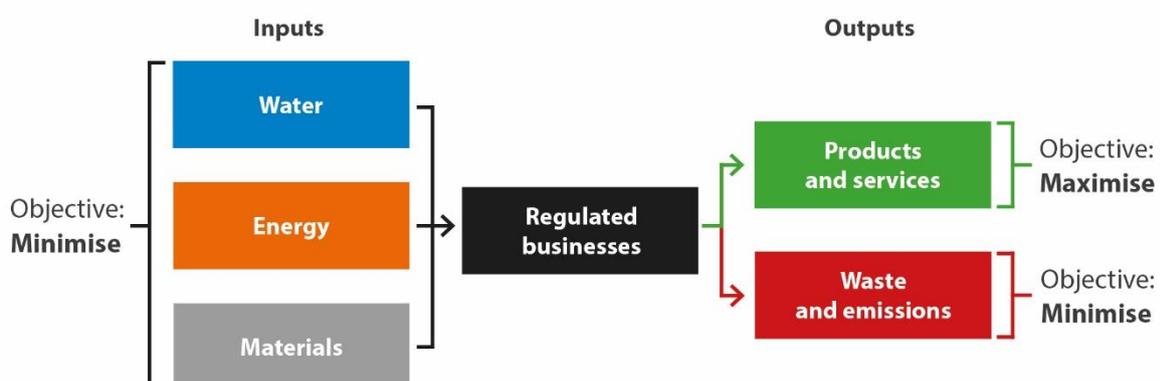
# 1. Introduction

For SEPA 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 the different set of rules we manage 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 regulation in working across whole sectors. In this way we can systematically identify the compliance issues that need to be tackled by the sector. But 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. We will 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.

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).

## Environmental flows (Figure 1)



We want to help as many businesses as possible to manage these flows effectively and reduce their use of natural resources and creation of waste in ways that enable them to meet their legal obligations, drive further improvements and operate their business successfully. To do 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 deliver solid outcomes will receive powerful support through guidance and advice. Those that demonstrate behaviour which leads to significant non-compliance can expect SEPA to use the most appropriate enforcement tools to bring them into compliance.

This is our sector plan for dairy production. It details how we will regulate the sector and work with it to protect and improve the environment. It explains how we will work directly with dairy producers and also includes ways in which we will work with them to use our shared influence to improve environmental performance throughout the industry supply chain.

The Dairy Production Sector Plan includes all on-farm activities that are necessary for the production of milk from the farming of dairy cows. This includes growing grass, keeping livestock, maintaining cattle sheds and milking parlours, managing manure and slurry and recycling and optimising reuse of a farm's resources. We are working closely to ensure that actions and innovations within the [Crop Production Sector Plan](#)<sup>1</sup> are shared with dairy producers.

The dairy production sector is currently not fully compliant with SEPA's environmental legislation; however, we are encouraged by the improvements that have been made to date by the sector working collaboratively with SEPA. It is in everyone's interest we work together ensuring those in the sector become compliant and identify opportunities for them to go beyond compliance. This includes working

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<sup>1</sup> Sector plans are available from [sectors.sepa.org.uk](https://sectors.sepa.org.uk).

with dairy producers across their supply chain until hauliers uplift milk from the bulk tank.

As well as this Dairy Production Sector Plan, we are also producing a [Dairy Processing Sector Plan<sup>2</sup>](#). This focuses on activities beyond the dairy production sector, as milk is uplifted by hauliers from the farm. We are working closely to ensure that actions and innovations within the Dairy Processing Sector Plan are shared with dairy producers. We are aware of the influence that processors have on producers, for example through pricing, accreditation and the need for close collaboration.

This plan covers dairy production from cows as they dominate the dairy production sector in Scotland. However, many of the actions will be the same for producers of milk from sheep, goats and buffalo.

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<sup>2</sup> Sector plans are available from [sectors.sepa.org.uk](https://sectors.sepa.org.uk).

## 2. Our vision for the dairy production sector

All dairy producers are compliant with environmental law; working with SEPA, other agencies and their local communities to fulfil their role as custodians of the land and water.

Dairy producers have realised the full value of their resources and the wastes they produce, minimising their use of raw materials, energy, and water; resulting in thriving efficient businesses, which produce a high quality product.

The dairy production sector benefits Scotland’s environment, livestock, farmers, communities and businesses. They work together to identify and take up innovative opportunities that are mutually beneficial.

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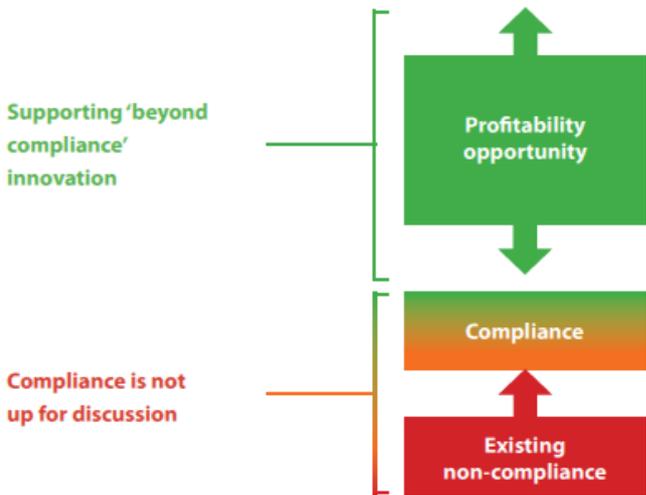
### Our objectives

The objectives of the sector plan are to:

- ensure all operators in the sector reach and maintain full compliance with Scotland’s environment protection laws;
- help as many operators as possible in the sector to move beyond compliance.

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

### Sector roadmap (Figure 2)



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

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 production sector on a pathway to becoming a 'one planet' sector.



### 3. The dairy production sector

Currently there are over 900 dairy herds in Scotland, which the National Farmers Union Scotland (NFUS) website reports is 9% of the UK dairy herd. Based on farm gate price of milk we estimate that dairy production in Scotland is worth over £400 million to Scotland's rural economy. The sector provides jobs including hired labour, casual labour and occupier/ spouse. In 2013, the Scottish Government estimated this to total 3,600 people<sup>3</sup>.

The majority of dairy producing farms in Scotland are concentrated in the South West with approximately 80% of herds located in Dumfries and Galloway, Ayrshire and the Clyde Valley. There are also small pockets of dairy producers across the north east of Scotland (Figure 3).

Scotland's dairy producers are concentrated in regions that have a higher than average rainfall and are conducive to grass growth. The climate in the west of Scotland is well suited to grazing systems and dairy production, and Scotland's natural resources contribute to sustaining a successful sector.

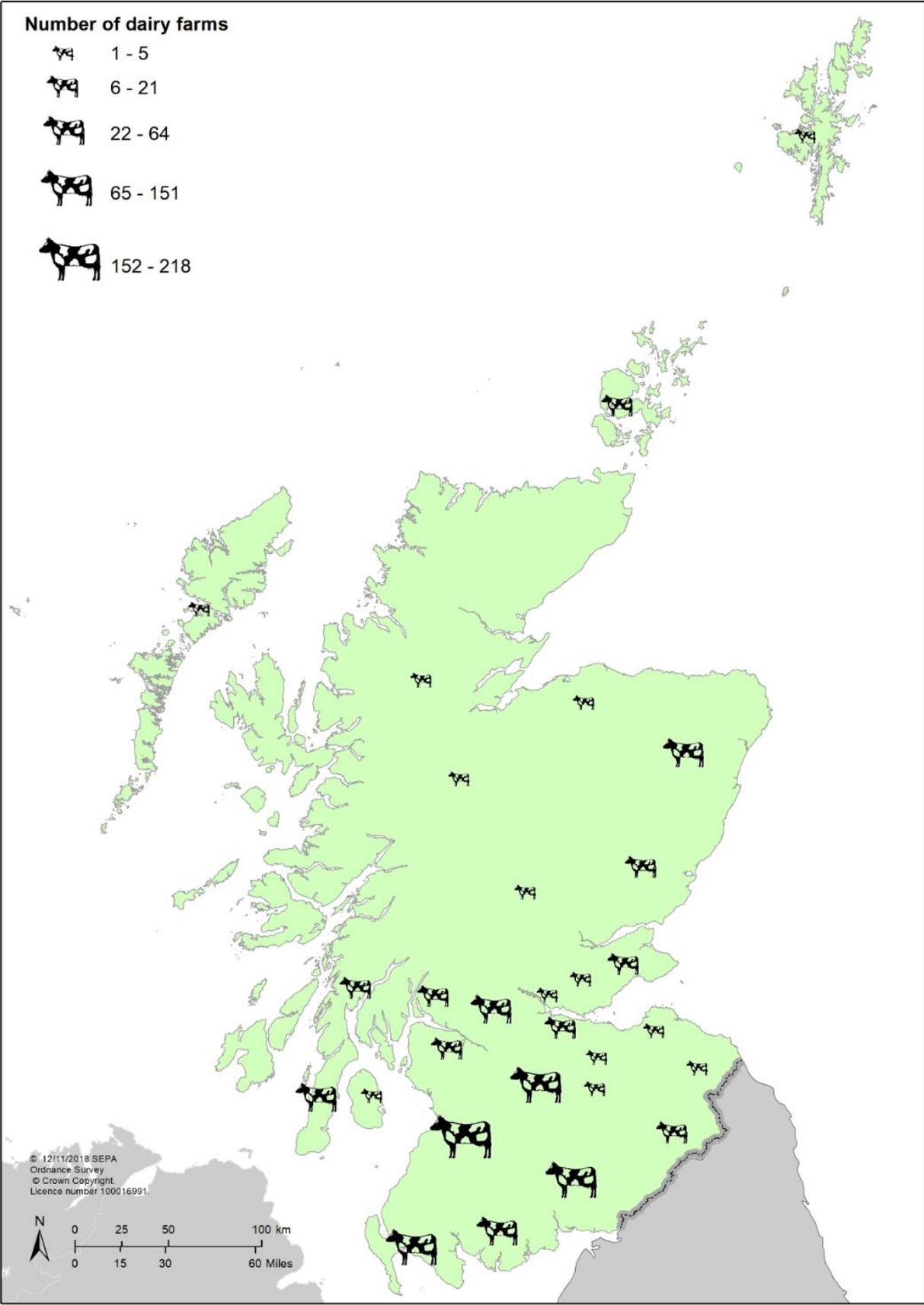
These areas often drain towards some of the most popular beaches in Scotland, contributing to faecal contamination at designated bathing waters, potentially affecting local economies.

Dairy production units in Scotland are diverse in size with business models ranging from small family farms milking 60 cows to more intensive units milking over 1,000 cows. The Scottish Dairy Cattle Association website gives the average herd size in Scotland as 199 milking cows.

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<sup>3</sup> The Scottish Government, *Economic Report on Scottish Agriculture 2017 Edition*

Dairy producers in Scotland (Figure 3)



The main dairy breeds milked in Scotland are Holstein/Friesian, Ayrshires and Jerseys. Other breeds are also milked, including Shorthorns and Brown Swiss. Dairy cows are very efficient at converting grass into protein and butterfat, and these five breeds work well in Scotland. In order to maintain high milk production, a dairy cow must produce a calf every year.

[\*Agricultural Facts and Figures 2018\*](#)<sup>4</sup>, published by the Scottish Government Rural & Environment Science & Analytical Services, reported the 2017 annual costs for an average dairy producer is in the order of £450,000 per farm. The equivalent cost for an average beef producer is £150,000, which emphasises the capital and variable costs associated with these farming sectors. Volatility in the prices of milk, forage and bedding also impact on industry stability and cause uncertainty about long term profits and business investment. Dairy farmers survive with relatively low profit margins and rely heavily on subsidies. According to the Scottish Government's *Agricultural Facts and Figures 2016*, the dairy farm average yearly income was £34,696 and subsidies were £35,294. Similarly, in 2015–2016, average yearly dairy farm income was £1,968 compared to subsidies which were £31,011. This impacts investment within the sector and can make major capital investment challenging for some farmers.

The methods used on farm vary from herd to herd, with some dairy producers having embraced innovation and technology (e.g. robotic milking systems), some moving to zero grazing (where the milking herd is housed all year round) to some largely unchanged from more traditional dairy farming, with livestock grazed outside during the summer.

The 2016 edition of the *Economic Report on Scottish Agriculture*, noted that dairy producers in Scotland sell approximately 1.5 billion litres of raw milk to dairy

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<sup>4</sup> [www.gov.scot/binaries/content/documents/govscot/publications/statistics-publication/2018/06/agriculture-facts-figures-2018/documents/00536433-pdf/00536433-pdf/govscot%3Adocument](http://www.gov.scot/binaries/content/documents/govscot/publications/statistics-publication/2018/06/agriculture-facts-figures-2018/documents/00536433-pdf/00536433-pdf/govscot%3Adocument)

processors, who then convert the raw milk into products such as liquid (fresh) milk, cheese butter, ice cream and powdered milk.

The majority of milk produced by Scotland's dairy producers is processed by Scottish-owned processors and multinational processors with Scottish sites. A small proportion of milk is transported to England for processing and can end up in a number of products including powder and cheese. How we work with processors is outlined in the [Dairy Processing Sector Plan](#). Each dairy producer enters into a contract with a processor and each contract is slightly different, locking the dairy producer into certain requirements that are set by the processor. There are also some dairy producers who engage in on-farm processing and therefore use a percentage of their milk to make products such as cheese, yoghurt, and ice-cream.

Dairy production requires a lot of energy, nutrients and water. There is no national average available for Scotland, but the UK headline value is that it takes about eight litres of water to produce one litre of milk<sup>5</sup>.

Dairy producers handle a number of materials such as manures and slurries, fertilisers, effluents, oils, cleaning chemicals and vet medicines, all of which must be managed to minimise their impact on the environment. Electricity is required to milk livestock, store milk and light farm buildings. Water is needed for feed production, for the animals to drink, or used to wash down buildings and to cool the milk to 3°C in the bulk tank. Electricity used in the milking parlour accounts for 85% of total electricity used on a dairy farm<sup>6</sup>.

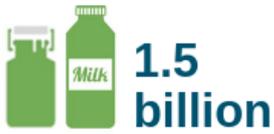
The consumption of resources can vary greatly from farm to farm. Simple measures can reduce resource consumption and increase resource reuse on a farm. Dairy production is a high energy use, water use and waste producing sector and we will build on our work with the sector to minimise their use of resources and emissions, meeting regulatory requirements and producing a high value product.

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<sup>5</sup> Cranfield University, Report Dairy Co. The Volumetric Water Consumption of British Milk Production, 2012

<sup>6</sup> Shortall et al 2018

**Facts and figures about dairy production in Scotland<sup>7</sup> (Figure 4)**



Litres of milk produced in Scotland per year



Dairy cows milked in Scotland daily



Scottish farms producing milk



Estimated industry's worth to Scottish economy



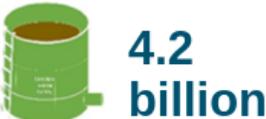
Of Scotland used in dairy production



Of water used per cow per day for drinking, washing up, milk cooling



Milk buyers operating in Scotland



Litres of slurry produced by Scotland's milking herd and spread on Scottish dairy farms



People directly employed by the industry, all in rural areas of Scotland

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<sup>7</sup> Data for Figure 4 sourced from the following:

- Agriculture fact and figures 2018 (Scottish Government);
- Scottish Dairy Hub;
- Scottish Dairy Cattle Association;
- Standard industry figures from the Scottish Government website.

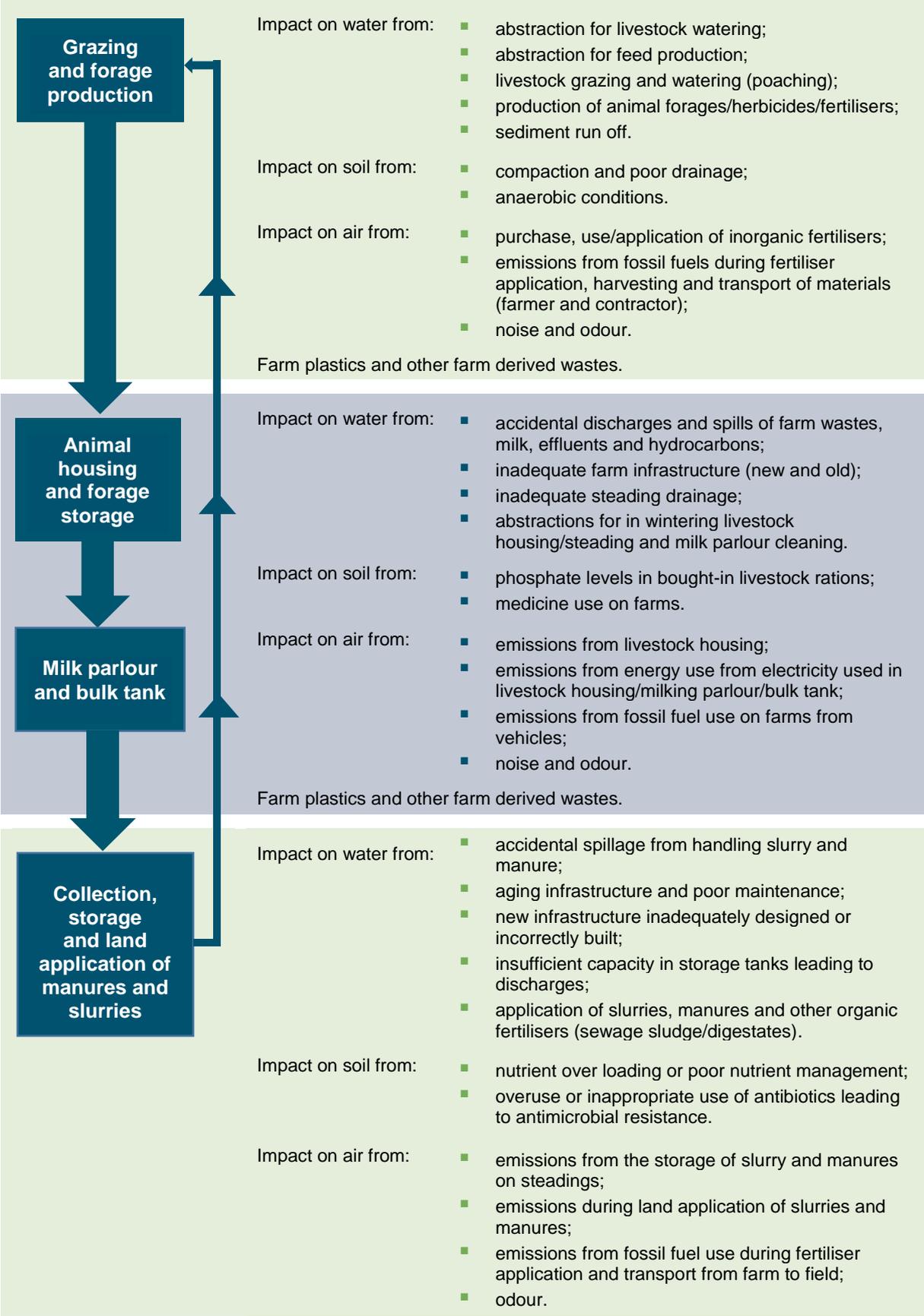
## 4. Environmental impacts and how we manage them

As Scotland's environmental regulator, we protect the environment from impacts of the dairy production sector. This sector produces materials and gases that have the potential to pollute water, land and air. These emissions can also contribute to climate change. The sector must work to minimise the impact of these emissions and reduce the sector's carbon footprint as it produces a high value product.

The environmental impacts of dairy production can vary greatly from farm to farm depending on the way on farm activities are carried out. Approaches to farming practice at key stages during dairy production can have a huge impact on the amount of pollution released into the environment. In addition, by properly managing on-farm nutrients, impacts can be offset and minimised. We already work closely with dairy producers, and the organisations that represent them, to highlight the key stages in the dairy production supply chain which have the potential to have detrimental impacts on the environment. In a traditional grazing system, for example, an increase in numbers within a herd can result in additional pressures and impacts on our soils due to livestock poaching in fields and bankside damage along watercourses. Since 2007 the average Scottish dairy herd size has increased from 136 to 199 cows. Figure 5 provides more detail on the key environmental impacts at various stages in the lifecycle of milk production on a farm.

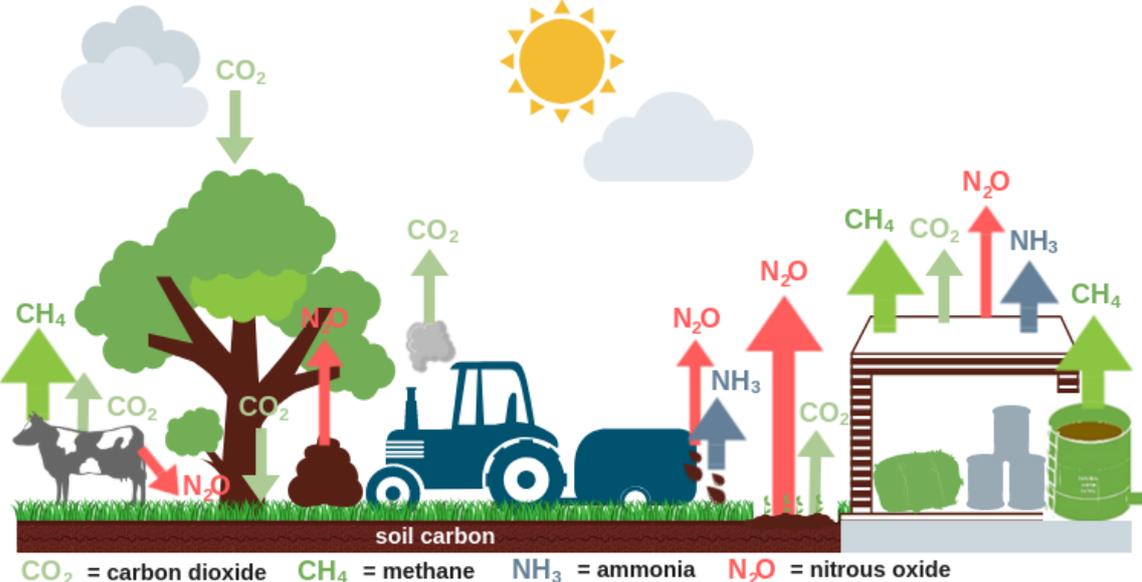


**Overview of environmental impacts associated with dairy production (Figure 5)**



Scottish Dairy Supply Chain Greenhouse Gas Emissions: Main Project Report 2011 estimated that 3% of Scotland’s direct Greenhouse Gas emissions are associated with the Scottish dairy supply chain. Although this includes processing, it stated that greenhouse gas produced during ‘Grass to farm gate’ stages of the life cycle, e.g. dairy production, made up 80%. Most of the greenhouse gases emitted from dairy production come from the cows and their feed, the storage of manure and the use of energy in the milking parlour.

**Greenhouse gas emissions from dairy production (Figure 6)**



# Environmental regulation of dairy production sector

**The Dairy Production Sector Plan will focus on compliance under the regulations that SEPA is responsible for enforcing. We will work in partnership with other organisations to help them to deliver their requirements.**

Unlike other intensive agriculture sectors (e.g. pigs and poultry), Scotland’s dairy production sector is not permitted or licenced directly as a distinct activity, instead it must comply with a suite of legislation. A brief summary of how SEPA and partner organisations regulate the sector is set out in the following section. Dairy farmers must comply with all of these regulations.

## **Environmental legislation used by SEPA and partner organisations to regulate the dairy farming sector (Figure 7)**

<b>Environmental regulation used by SEPA</b>
<ul style="list-style-type: none"><li>■ Water Environment Controlled Activities (Scotland) Regulations (CAR) 2011 – General Binding Rules, registrations, licences:<ul style="list-style-type: none"><li>• Diffuse Pollution;</li><li>• Oil storage;</li><li>• Abstraction;</li><li>• Pesticides.</li></ul></li><li>■ The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (Scotland) Regulations 2003 (SSAFO)</li><li>■ Environment Protection Act 1990 (EPA 90) Waste Management Licenses:<ul style="list-style-type: none"><li>• Farm burning;</li><li>• Imported wastes.</li></ul></li><li>■ Waste Management Licensing (Scotland) Regulations 2011<ul style="list-style-type: none"><li>• Waste Management exemptions</li></ul></li><li>■ The Fluorinated Greenhouse Gases Regulations 2015</li><li>■ The Ozone Depleting Substances Regulations 2015</li></ul>

### **Environmental regulation used by the Scottish Government and local authorities**

- The Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2008
- The Common Agricultural Policy (Cross Compliance) (Scotland) Regulations 2014
- Animal Health and Welfare (Scotland) Act 2006
- The Food Hygiene (Scotland) Regulations 2006
- The Town and Country Planning (General Permitted Development) (Scotland) Order 1992
- The Building (Scotland) Regulations 2004

SEPA has direct responsibility for regulating all activities as set out under the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (Scotland) Regulations 2003 (SSAFO). This governs the design, location, construction and maintenance of silage and slurry storage facilities on farms. It is not specific to dairy farming.

We also regulate land based activities undertaken during the course of dairy production under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR), known as the General Binding Rules for rural diffuse pollution. A small number of producers may hold registrations or licences under CAR for the abstraction of water, for livestock watering, washing up, milk cooling and for various river engineering activities.

Some producers also operate activities under the Waste Management Licensing Scotland Regulations 2011 exemptions for application of beneficial organic wastes to land, and reuse of material to make farm tracks and gate access.

Some dairy producers above a certain threshold will be regulated under the Fluorinated Greenhouse Gases Regulations 2015 and the Ozone Depleting Substances Regulations 2015.

New farm buildings and storage facilities 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.

Dairy producers are also required to comply with legal obligations enforced by other organisations that we work in partnership with, such as the Scottish Government Rural Payments and Inspection Directorate (SGRPID) for the Common Agricultural Policy (Cross Compliance) (Scotland) Regulations 2014, and the Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2008. Our staff check compliance with these Regulations and if any non-compliance is observed it is reported to SGRPID.

Around 80% of environmental legislation in Scotland originates from the European Union. As the UK leaves the EU, changes will, where necessary, be made to domestic legislation 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 with environmental laws and taking enforcement action will not diminish as a result of the UK leaving the EU.

## **Wider influences on environmental performance of the dairy production sector**

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

We need therefore to combine the actions that we can take to influence the behaviour of a business through our regulatory role with all the other influences. Doing this will be the most effective way to secure full compliance and to help as many businesses as possible to move beyond compliance.

Working with the sector, we will place this more sophisticated way of operating at the heart of our work. Figure 8 summarises the main organisations that influence, and are influenced by, operators in the dairy production sector. It also identifies those that we are likely to 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.

**Dairy production key influences (Figure 8)**



## 5. Tackling non-compliance and taking opportunities to go beyond

### Compliance in the sector

Through the [river basin management plans](#)<sup>8</sup>, SEPA has set out how it is working to tackle rural diffuse pollution from agriculture. The priority catchment approach was agreed in partnership with the [Diffuse Pollution Management Advisory Group](#)<sup>9</sup>, members include key stakeholders within the sector, as a solution to diffuse pollution impacts from agriculture and forestry sources. Priority catchments were identified because monitoring of failures in bathing waters and shellfish waters indicate that these are a result of faecal bacteria entering rivers. Agricultural activities within the catchments were identified as the most likely source.

We are currently gathering detailed evidence through an intensive monitoring programme in livestock catchments to demonstrate the positive effect of compliance on water quality, and highlighting how reducing soil and nutrient losses can improve farm efficiency. This evidence can also help to identify high risk periods and activities to help target further action and evaluating the plan.

We know from Scotland's rural diffuse pollution priority catchments that the majority of the dairy production sector is not currently doing all that they are required to do to be fully-compliant with environmental legislation. When non-compliance issues were highlighted on farm the sector worked with SEPA to put a plan in place to become compliant. We are confident that this is representative of the sector as a whole. Over 5,000 farms have been visited, 400 of which are dairy producers. Priority catchment work will continue beyond 2021, and additional dairy producers will be assessed when the catchment that they farm in is visited.

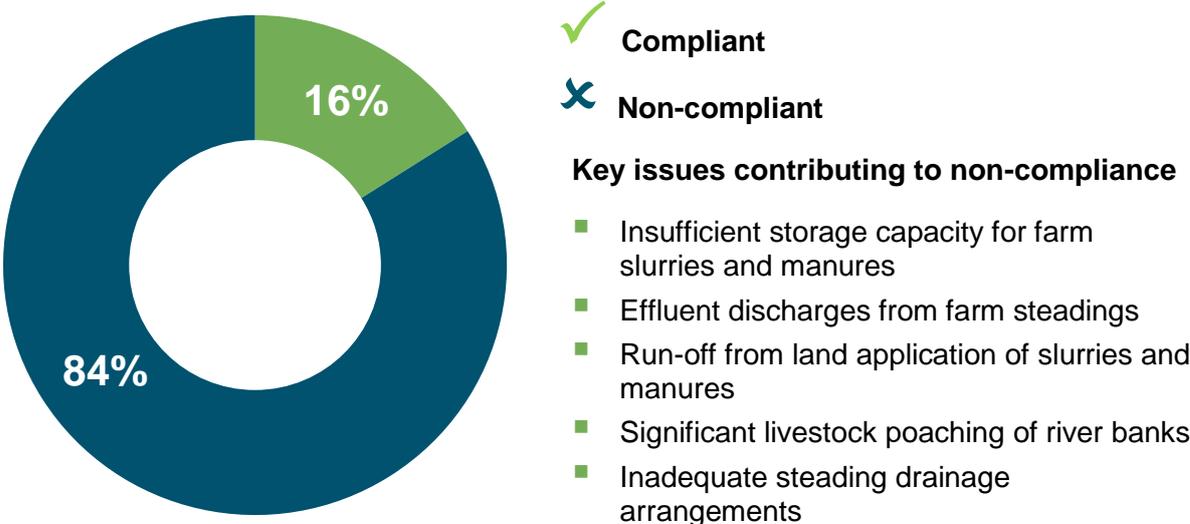
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<sup>8</sup> [www.sepa.org.uk/environment/water/river-basin-management-planning/](http://www.sepa.org.uk/environment/water/river-basin-management-planning/)

<sup>9</sup> [www.sepa.org.uk/environment/water/river-basin-management-planning/who-is-involved-with-rbmp/dpmag/](http://www.sepa.org.uk/environment/water/river-basin-management-planning/who-is-involved-with-rbmp/dpmag/)

Since 2011, we have been actively working with those 400 dairy producers in priority catchments. When dairy producers were first visited through the priority catchment work the compliance rate was only 16%, as shown in Figure 9. This meant that the majority of the sector was not complying with environmental law.

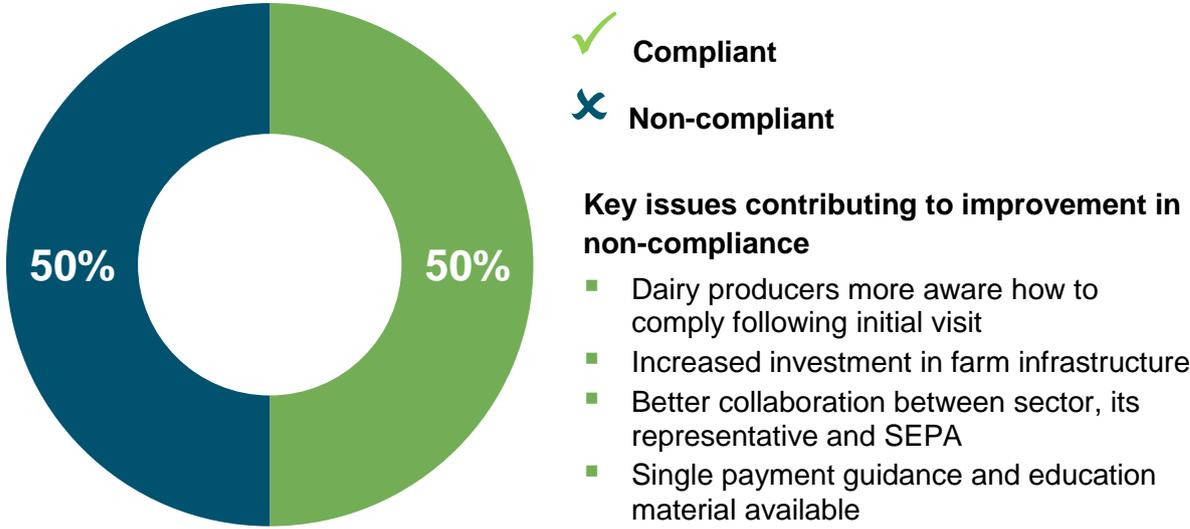
**Environmental compliance rate of dairy producers at initial SEPA visit in Scotland’s diffuse pollution priority catchments (Figure 9)**



Engagement, through work in priority catchments, tells us that the main reason for low levels of compliance is most commonly a lack of understanding about what was required to meet minimum legislative requirements. We also know from work in priority catchments that working with the dairy production sector to inform and support them to make changes to farm practices results in significant improvements in compliance.

Figure 10 shows that within 12 months of their visits, the compliance rate for the 400 priority catchment dairy producers increased to half with the remaining still non-compliant, but taking action to work towards compliance. SEPA will take enforcement action, including fixed monetary penalties, on those dairy producers who decide not to change their attitude to practices on farm.

**Environmental compliance rate of dairy producers 12 months after initial SEPA visit in Scotland’s diffuse pollution priority catchments (Figure 10)**



**How will we work with the sector to reach compliance?**

From our work in priority catchments we have identified the most common environmental non-compliances. These will be tackled as part of this sector plan through our action plan to help all dairy producers become compliant.

Working with partners and the Diffuse Pollution Management Advisory Group we have already helped dairy producers within priority catchments to achieve compliance, and will continue to support all dairy producers as long as they are willing to work with us. Where necessary we have taken enforcement action, but through our experience in priority catchments we have established a successful supportive approach.

We are encouraged by the evidence from this work, which shows us that clear explanations of what is required on farm, delivered directly to the farmer, works. We will apply this approach across the sector.



Farmer engagement

SEPA will:

- visit dairy farms across Scotland to check compliance and share any non-compliance issues found;
- work with dairy producers to identify an action plan to tackle non-compliance putting measures in place to meet requirements;
- only take enforcement action where a dairy producer remains non-compliant.

We will continue to work with our partners to deliver this successful cooperative approach. We will also help responsible compliant businesses to operate by making it significantly harder and more expensive for those who persistently fail to comply with environmental regulation 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.

### Common non-compliance the sector must address (Figure 11)

Infrastructure or activity on farm	Resulting non-compliance
Farm infrastructure	<ul style="list-style-type: none"> <li>■ Poorly managed or incorrectly maintained aging farm infrastructure can lead to uncontrolled spillages, overflow or leaks of farm effluent which can cause pollution of the water environment.</li> </ul>
Drainage issues	<ul style="list-style-type: none"> <li>■ Poor management of clean and dirty water drainage on farm, exacerbated by lack of any formal farm drainage plan can lead to water pollution.</li> </ul>
Livestock slurry	<ul style="list-style-type: none"> <li>■ Insufficient on farm slurry storage leading to poor slurry management resulting in slurry applications being undertaken on the wrong field at the wrong time, in the wrong conditions and with the wrong application rate can lead to water pollution.</li> </ul>
Livestock poaching	<ul style="list-style-type: none"> <li>■ Intensification within the dairy production sector has increased the pressures on farm soils due to livestock poaching.</li> <li>■ The most common non –compliance within this sector is significant poaching within 5m of the water environment leading to bank side erosion and faecal contamination of water due to no restriction on livestock entering watercourses.</li> </ul>

## **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.

To do this, every business must reach full compliance with environmental laws. But mere compliance and small scale incremental change will not be enough. At SEPA 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.

In the dairy production sector many of the opportunities to go beyond compliance are also opportunities to save resources, reuse and maximise nutrients, and reduce reliance on and make better use of antibiotics and other veterinary medicines in ways that generate business efficiency improvements. We will use our influence, experience and knowledge to help the dairy production sector to identify these opportunities whilst working with them to reach compliance.

Working in partnership is key to delivering this work. Therefore, we will continue to work with the Diffuse Pollution Management Advisory Group and other key stakeholders.

There are also opportunities to tackle the big issues, such as greenhouse gas emissions and climate resilience, and reliance on and consequences of antibiotic use. These opportunities are summarised below under three themes: water, materials and energy.

## Water

**Water in the right place, in the right amount and of the right quality underpins our society and economy. We need water to drink, wash, grow food, supply power, build things and maintain the benefits we all receive from a healthy functioning natural environment. Scotland's water resources vary by orders of magnitude in time and space and uncontrolled exploitation of water can affect its availability for other uses. This may be by increasing flood risk, reducing water availability, polluting water supplies or introducing invasive species into rivers, lochs and groundwater. All of these risks may be further enhanced as our climate changes and it is important that sector plans take account of risks from and to water resources.**

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SEPA is developing a Flood Strategy that will consider themes of future change, social impact and extended engagement in defining our ambition and outcomes to deliver effective flood risk management now and in the future. As land managers within the catchment, the dairy production sector has an important role to play.

The sector is a significant water user, relying on an available supply of good quality water (mains/private) to produce milk for processing. The sector also has the potential to impact on groundwater, and surface water quality and quantity through poor stabling management, livestock grazing and application of organic and inorganic fertilisers to land.

We will work with the sector to protect Scotland's water quality, reduce water demand and build resilience to climate change.



SEPA's aspirations are to support the sector to go beyond compliance by:

- Bringing together experts from the dairy processing sector and other industries to share best practices in minimising water use, water treatment, water capture and reuse.
- Working with the Scottish Government and industry representatives to encourage the uptake of precision application techniques for slurry spreading, minimising the potential for pollution from land run-off and emissions of greenhouse gases.
- Working in partnership, actively promote the environmental and livestock benefits of woody riparian zones and agroforestry.

#### **Good practice examples: water collection and treatment**

**(1)** Constructed farm wetlands (CFW) treat lightly contaminated drainage from around farm steadings. By taking winter runoff from yards and silage pits to a CFW, they free up capacity within existing slurry storage facilities, build slurry resilience and minimise the likelihood of pollution from yard drainage. These systems have been in use for the last 10 years throughout Ireland and are now being considered and installed in Scotland.

**(2)** Reducing the amount of water collected and disposed of can reduce costs, particularly energy and labour costs, so effective management of dirty water can be a good opportunity to save money. [Agriculture and Horticulture Development Board (AHDB), Efficient use of water on a dairy farm, 2015]

## Materials

**SEPA views the circular economy as a game-changing opportunity to manage resources within planetary limits, reduce the harms associated with waste management and create economic opportunities. We must dramatically cut waste production across the economy, recover more and dispose of only the very minimum. Where waste is produced, we will always seek to facilitate the productive use within a framework of strong environmental protection.**

**Not only can resource efficiency improve productivity, and the bottom line for business, it can also bring environmental improvements and reduce our reliance on virgin raw materials.**

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The dairy production sector uses and produces a significant amount of materials. By materials we mean both natural and manmade materials, including soils, animals, fertilisers (organic and inorganic), forage, antibiotics and other veterinary medicines, and plastics. Dairy production needs healthy soils that can utilise the slurries and manures produced on the farm to stimulate the growth of grass for livestock feeding. The sector must cut waste production, seek to keep materials in use for as long as possible and minimise wastes. Where waste is produced, we will always seek to facilitate the productive use within a framework of strong environmental protection.

Soil has limits to the amounts of phosphates it can hold, beyond this it starts to release it to the wider environment causing pollution. There is an opportunity to consider how slurries could be further treated to produce fertilisers for other agricultural sectors in an easily transportable form. The [Crop Production Sector Plan](#)<sup>10</sup> has identified an action to explore this opportunity. Recycling slurries and manures through land treatment has the potential to deliver significant financial savings for the farm business as well as making more sustainable use of resources, and reducing greenhouse gas emissions.

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<sup>10</sup> Sector plans are available from [sectors.sepa.org.uk](https://sectors.sepa.org.uk)

Milk production requires happy, healthy livestock, which are efficient in converting forage and water into milk. Research in the dairy sector<sup>11</sup> is increasingly recognising the value of biodiversity for healthy and resilient dairy systems. This includes the benefits that having diverse flower rich swards and hedgerows can have to animal health, reducing antibiotic use, and the improved quality of milk for example milk protein levels. Some dairy processors have started to increase what they will pay to farmers who invest in their farm biodiversity in recognition of the benefits of reducing antibiotic use and improved protein content.

SEPA's aspirations are to support the sector go beyond compliance by:

- Collaborating with industry (producers, processors, and consultants), the Scottish Government and academics to identify innovative solutions to slurry resilience across the sector.
- Encouraging new steading infrastructure and application techniques to drive down greenhouse gas emissions from livestock handling, slurry storage and spreading.
- Working with partners to improve understanding within the sector of the importance of soil health for drainage, erosion, organic matter and phosphorous.
- Working with partners to encourage active nutrient management planning and carbon off-setting by dairy producers.
- Contributing to research to optimise and support improvements in animal nutrition, thereby driving down emissions of greenhouse gases and nutrients, and reducing inappropriate use of antibiotics on dairy farms.
- Working with stakeholders across the supply chain to minimise plastic use across the sector, to improve the collection and recycling of farm plastics and to support the market to introduce a minimum recycled content of new plastic materials.
- Explore opportunities to produce fertiliser for the crop sector from slurries (via SEPA's Crop Production Sector Plan).

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<sup>11</sup> [Resilient Dairy Landscapes - The Project](#)

- Explore opportunities to work with dairy producers and processors to invest in diverse swards and hedgerows to improve quality of the product, reduce antibiotic use and improve security for farmers making these investments (in conjunction with the Dairy Processing Sector Plan).

### Good practice example: low emission spreading equipment

Low emission spreading equipment can reduce odours and improve dispersion of fertilisers, compared to a broadcast application. Adoption of a trailing hose or trailing shoe will reduce ammonia emissions to air and water from slurry application by between 30%-60%. [DEFRA Code of Good Agricultural Practice (COGHAP) for reducing ammonia emissions]



Precision application: trailing hose application of slurry at Low Ballees Farm, West Kilbride

## Energy

**Energy is an essential resource that enables social and economic development, however while energy is fundamental to the economy, electricity and heat production, transmission, storage and use can have significant environmental impacts.**

**How we use and manage our energy resources is central to our ability to live within the resources of our planet. Energy is one of the most important aspects of the transition to a sustainable low carbon economy and there are often cost savings and other benefits for businesses associated with improving their energy efficiency and making use of alternative sources of energy.**

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Dairy production is energy intensive. The milking process uses significant amounts of electricity for cooling and storing milk. In addition, electricity is required for heating water, lighting, and ventilating the milking parlour and cubicle housing. Vehicles used for feeding livestock, spreading slurry and manures, and cutting/hauling silage also use energy.

We will work with the sector, Scottish Government and partners to help encourage delivery of the future of energy in Scotland. The future ambitions are contained in the Scottish Energy Strategy and SEPA's Climate Change Commitment Statement. On dairy farms this will mean changing management practices, investing in new technologies, and switching to low carbon and renewable energy sources. Dairy producers are already changing how they operate due to the increasing cost of electricity and oil.

SEPA's aspirations are to support the sector to go beyond compliance by:

- Working in collaboration with the Scottish Government and industry to promote cost effective measures to reduce energy consumption on dairy farms and encourage alternatives to fossil fuels.
- Contributing to discussion on rural funding for on-farm renewable energy production.

- Contributing to discussions into opportunities for use of non-fossil fuel driven farm vehicles.
- Working with industry (producers, processors, consultants) to promote farm scale energy benchmarking and using this to promote opportunities for Scotland's dairy producers to adopt energy efficient practices and technologies.

### Good practice examples: using technology to reduce energy

- (1) Retrofitting a variable speed drive to the vacuum pump on a dairy farm, could save around £5,500 over 10 years based on 2014 energy prices. [Agri-renewable strategy for Scotland]
- (2) The dairy production sector is already adopting new technology and agri-renewable technology to reduce on farm energy costs. For example: investment in wind turbines, solar panels on cubicle houses and in fields, anaerobic digestion and wood fuelled biomass.



Bulk tank storage on a farm

## What actions are we going to take?

The following table summarises the actions that we have described above to fix compliance in the sector and, working in partnership, help businesses take opportunities to go beyond compliance. These are described according to the key outcomes that we would like this sector plan to achieve. The actions and aspirations set out are our initial thoughts on what needs to be done to achieve the aims of this sector plan. We are at an early stage in sector plan development, and the actions that we prioritise will be informed by the findings of this consultation and further internal discussions between now and March 2019.

We feel that delivering our priority catchment approach to all dairy producers will help the sector become compliant. We also feel that discussions during farm visits can introduce the opportunities to go beyond compliance; highlighting the environmental and business case for taking such actions.

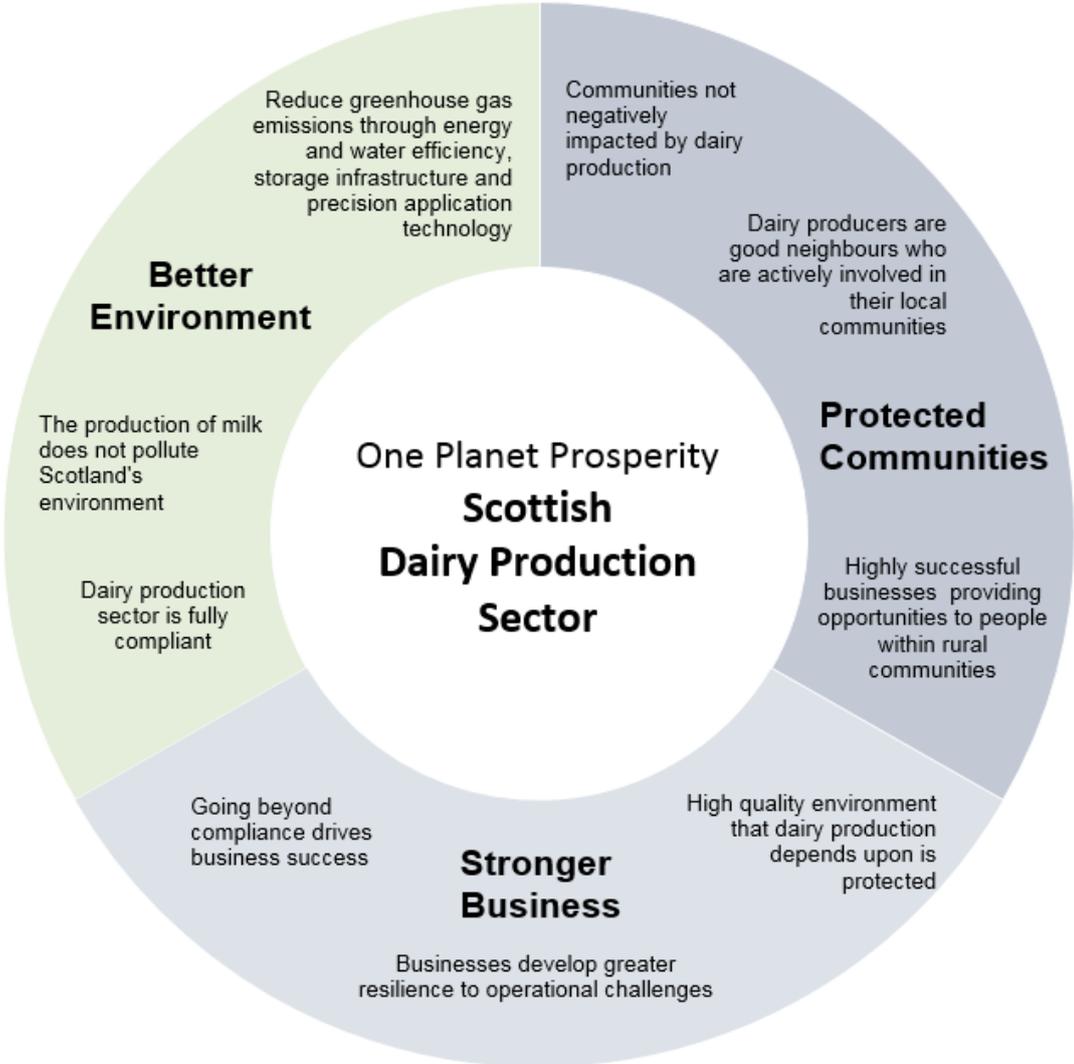
Outcome sought	Actions and aspirations
Dairy production sector is fully compliant	<ul style="list-style-type: none"> <li>■ Extend diffuse pollution priority catchment programme to all dairy producers. This will include assessing compliance and working with those identified as non-compliant. We will revert to enforcement action where our actions don't achieve the desired result.</li> <li>■ Invest in SEPA staff so they can provide knowledgeable, consistent and pragmatic support to dairy producers.</li> <li>■ Work with partners to deliver business efficiency guidance to on farm dairy processors in relation to waste minimisation.</li> </ul>
Maximum value is derived from organic fertilisers (manures and slurries) produced on farms	<ul style="list-style-type: none"> <li>■ Work in partnership with the Scottish Government and industry to make the Scottish dairy farming sector a global leader for best practice in handling, storing and application of organic manures and slurries.</li> <li>■ Develop, in collaboration with industry and dairy processors, case studies demonstrating the benefits of using precision slurry spreading technology.</li> </ul>

Outcome sought	Actions and aspirations
Maximum value is derived from organic fertilisers (manures and slurries) produced on farms [continued]	<ul style="list-style-type: none"> <li>■ In collaboration with industry, promote the benefits of dairy producers actively utilising nutrient budgeting, undertaking regular soil testing and slurry analysis.</li> <li>■ Encourage and support the adoption of farm-scale or community anaerobic digestion developments.</li> </ul>
Reduce emissions from dairy production	<ul style="list-style-type: none"> <li>■ Work with the Scottish Government and other partners to encourage dairy producers to reduce greenhouse gas emissions from the storage and spreading of organic fertilisers.</li> <li>■ Work with partners to actively encourage dairy producers to use expert advice to optimise feed plans, which are directly linked to reducing livestock emissions.</li> <li>■ Work with dairy farmers, the Scottish Government, researchers and other stakeholders to help reduce the incidence and prevalence of diseases in cows, increase milk production and reduce inappropriate use of antibiotics and other veterinary medicines.</li> <li>■ Work with partners to actively encourage dairy farmers to manage their land in a way that maximises biodiversity and contributes to restoring natural catchments.</li> </ul>
Increase energy efficiency on farm	<ul style="list-style-type: none"> <li>■ Work with partners to actively encourage dairy producers to become more energy efficient in relation to water use, lighting, reuse of heat, biomass and electricity.</li> <li>■ Explore with Scottish Government, industry representatives, dairy processors and partners the opportunities for dairy producers to move into agri-renewables energy.</li> <li>■ Work with partners and dairy producers to phase out the use of fluorinated gases in refrigerant systems.</li> </ul>

Outcome sought	Actions and aspirations
Sector specific training and guidance	<ul style="list-style-type: none"> <li>■ Produce sector guidance to help dairy producers understand the environmental risks associated with their businesses.</li> <li>■ Work with industry representatives to deliver improved guidance on environmental compliance, agro-forestry, water minimisation and reuse, energy efficiency and agri-renewables.</li> <li>■ Engage with agricultural colleges and universities to ensure our future dairy producers are fully equipped to deal with the environmental challenges they face.</li> <li>■ Work with SEPA staff to improve guidance for dairy producers in respect of new on farm infrastructure.</li> <li>■ Create an easily accessible, regularly maintain dairy production intranet page for officers working with dairy producers.</li> <li>■ Work with NetRegs to deliver clarity and accessibility to guidance.</li> </ul>
Supply chain sustainability and incentives	<p>Work with the Dairy Processing Sector Plan to:</p> <ul style="list-style-type: none"> <li>■ Engage with dairy processors and supermarkets and accreditation schemes to explore what opportunities there may be for influencing or incentivising dairy producers to deliver beyond compliance actions.</li> <li>■ Work with dairy processors, research institutions and farming representatives to explore opportunities around reducing antibiotic use within dairy production.</li> </ul> <p>Work with research institutions and farming representatives to explore opportunities to reduce the amount of wastes arising on farm and to develop the technology to get better value from wastes.</p>

# 6. Outcomes

If we achieve the vision we have set out in this plan, we anticipate that we will help to deliver positive outcomes that protect and improve the environment in ways that also protect communities and enable businesses to operate effectively and successfully in their markets.



For information on accessing this document in an alternative format or language please either contact SEPA by telephone on 03000 99 66 99 or by email to **[equalities@sepa.org.uk](mailto:equalities@sepa.org.uk)**

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