

## **Appendix 11**

### **The Farming and Food Sector**

#### **What this work area covers?**

Agriculture and food production are crucial to the economy and environment of Somerset with over 10,000 people employed. It also has national importance in terms of the delivery of food and the natural environment with 275,000ha of farmed land in the county. The industry in the South West contributes over £1bn to the regional economy.

The narrative around farming and food is one of “complexity”. There is complexity not only regarding agriculture’s role as an emitter and sequesterer of carbon but also how the land should be managed and what role farming plays in the delivery of wider social and environmental benefits. As such, it should be noted that this is an emerging and dynamic policy area and will need to adjust according to new evidence, science and best practice. It is also important to note that the agricultural industry will be significantly impacted by climate change: rising temperatures, changing rainfall patterns and variations to atmospheric CO<sub>2</sub> concentrations will impact operations and productivity, as well as pest prevalence, within the UK.

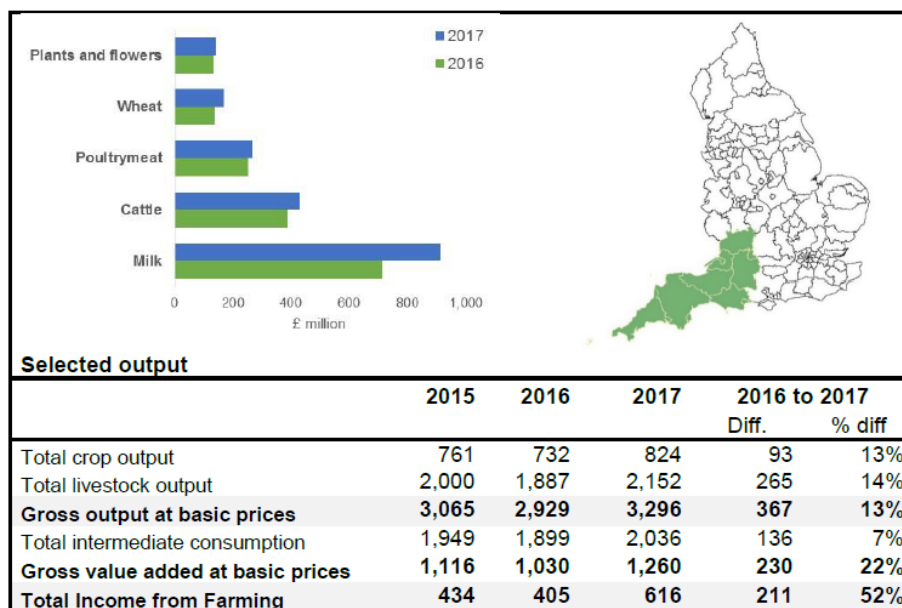
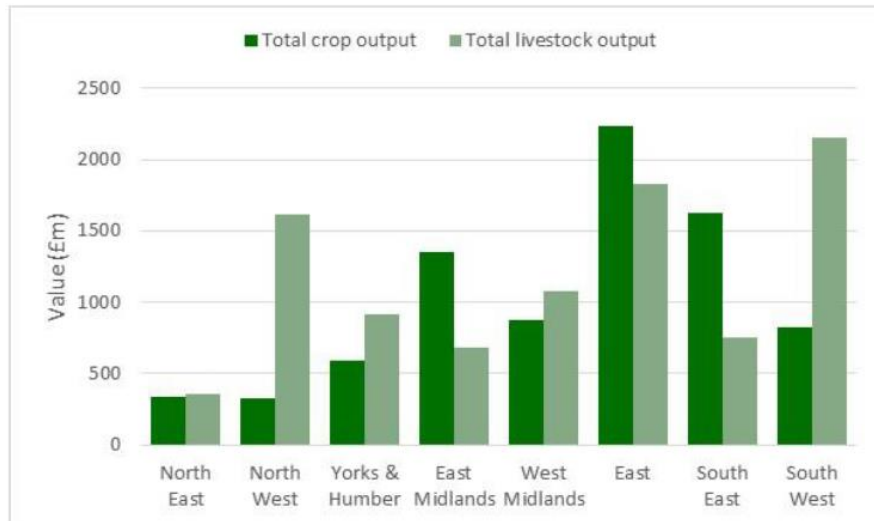
This area of work is focused on the farming sector but with reference to the food sector. Both areas will be developed over time and there must be a recognition that this is an iterative process.

There are links to many of the other workstreams within the climate strategy but particularly the Natural Environment. As the majority of the landscape of Somerset is in agricultural production or under management control of farm businesses the workstreams will work alongside each other through the Local Nature Partnership to ensure that the response of this workstream recognises the value of protecting, restoring and creating habitat for nature within a productive landscape. This also links directly to opportunities to deliver multiple outcomes that contribute to the objectives of other workstreams particularly water and energy.

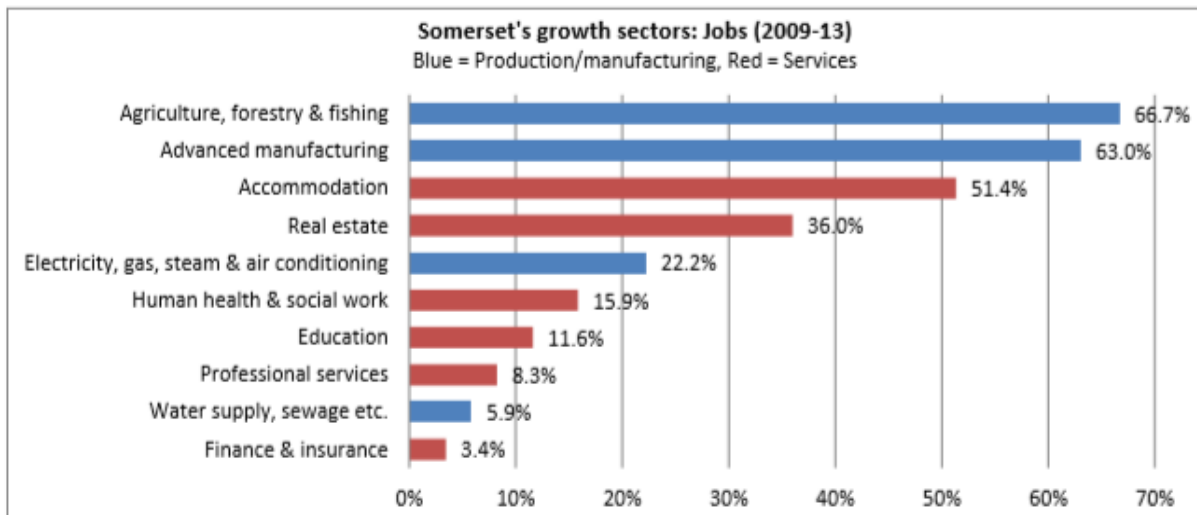
#### **The value to Somerset’s economy**

Total income from farming for England was £3.3bn in 2018. The key drivers of agricultural income include the volume of production, commodity prices and the cost of inputs. These are themselves driven by a range of factors such as the weather, exchange rates, oil price, global supply and stocks of commodities. As a result, agricultural incomes tend to be volatile and fluctuate from year to year. A range of external factors contribute to regional variations in farming, including climate, soils, topography and altitude. These in turn influence what commodities are produced and how efficiently and hence the value of production and incomes achieved.

In Somerset there are 275,000 farmed hectares and is the second largest county in the South West, which has a total farmed area of 1,835,000 hectares. Predominant farm types are dairy and grazed livestock with dairy the largest contributor to the SW economy with the contribution listed as just over £1bn in the latest figures posted. The below chart shows the comparison across the country as at 2017 and shows the reliance on the livestock sector throughout the South West.



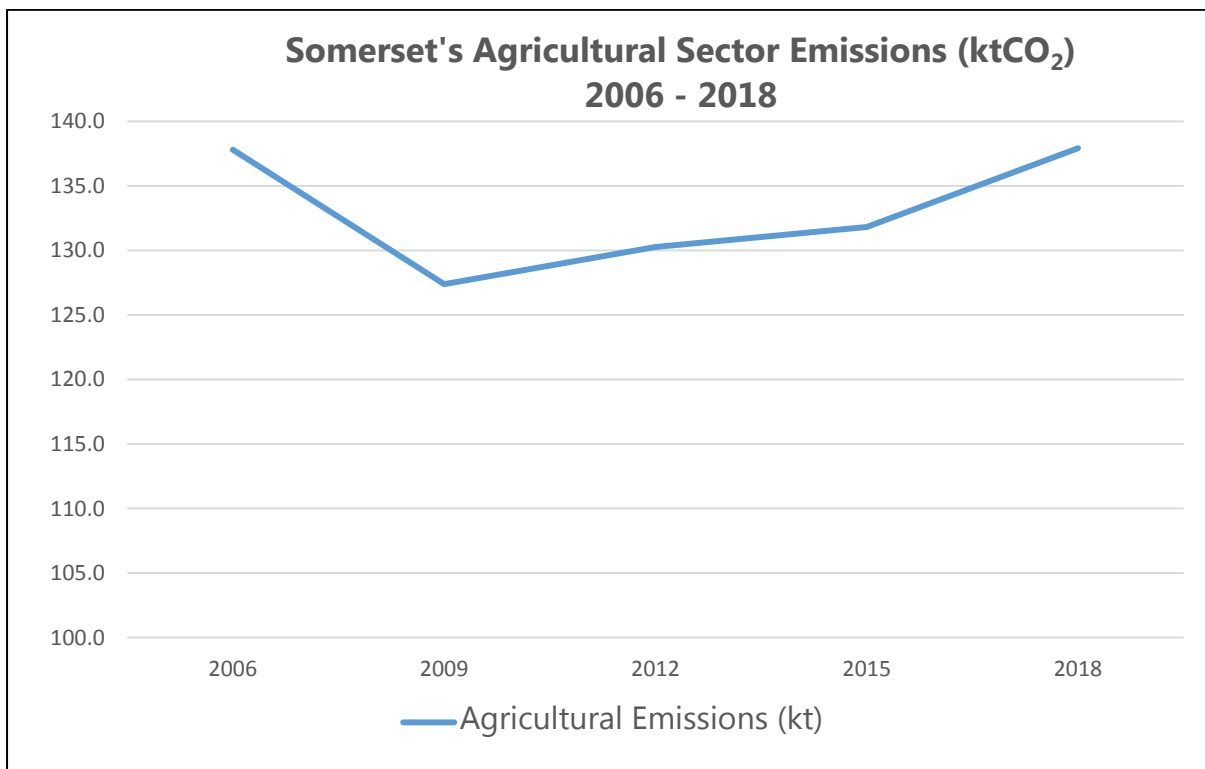
The food and farming economy are a large employer across the UK, providing 1 in 8 jobs, in Somerset there are over 10,320 employed in agriculture not including associated food industries. The agriculture, forestry and fishing sector has shown the highest level of job growth in Somerset since 2009, with an increase of 66.7%. Despite this, the economic contribution of the sector in Gross Value Added (GVA) terms has fallen by 8.9%, indicating reduced levels of productivity.



Source: Business Register and Employment Survey, NOMIS 2014

### The Analysis of Current Situation - What we know?

Agriculture and food production are crucial elements in the management of our local environment and the economy of Somerset. The latest BEIS<sup>7</sup> data shows that the total carbon emissions from the County's agricultural sector have remained static over the past 12 years at around 133 ktCO<sub>2</sub>, which equated to around 4% of the total emissions for Somerset in 2018.



Source: [UK Local Authority & regional CO<sub>2</sub> emissions national statistics 2005-2018](#)

It is arguable that climate change is already having an impact at a farm level across Somerset. Changes to the way rainfall events happen over a year, coupled with

changes to temperature in the different seasons, has meant increased challenges for farming. At a farm level this means farmers: changing cropping dates, housing livestock for longer, dealing with extreme weather rapidly moving from periods of wet managing flooded land or erosion risks to dry trying to provide feed for livestock or irrigating crops.

The current situation in farming is very volatile. The recent impacts of Covid 19, Brexit and the lack of transparency on future trade agreements the UK will be entering into, along with the associated tariff and non-tariff barriers, mean it is almost impossible for food producers and the food supply chain to develop their business models for the future with any confidence.

This, coupled with the ongoing consultations on the Agriculture Bill and Environment Bill, mean that when and how government will provide support for decarbonisation of the sector is unknown. As such many farmers are keen to find solutions that provide some form of stability in the short to medium term, but the agricultural sector will need clarity on market risks and opportunities.

However, there are several "*knowns*" that mean action can be taken now to address both Climate Change mitigation and adaptation and it is imperative that farms do so if they are to remain viable, resilient and able to meet the opportunities and threats presented. From a farming perspective, greater resilience to Climate Change can also mean increased farm viability, efficiency and productivity and deliver for the environment.

Impacts to global food production could influence UK markets, diets and the food industry. There are numerous views around the role of different diets and land management practices and the focus for Somerset must be on having the best and most efficient land management use on the most appropriate area. Farmers work within a strict regulatory framework and there should be a strong recognition of this along with support and guidance to develop best practice.

What this means for Somerset agriculture is considerable uncertainty in terms of the mechanisms available to achieve change at a farm level. The National Farmers' Union (NFU) has committed to 'Net Zero' by 2040<sup>2</sup> so as an industry there is leadership and support for developing net zero policies that support farmers and the delivery of wider environmental and social benefits. Farm incomes come from various sources which adds to the complexity highlighting the need for effective "business support".

Access to new environmental markets are important, especially in relation to Climate Change and the ecological emergency, with both private and public finance and the ability for public goods to be procured from farmers a priority.

Net Zero represents an opportunity for the sector to deliver business productivity and new market opportunities. Developing ideas around dynamic procurement and the balanced score card for public procurement give a framework for public services to source a range of public goods including health, biodiversity, environment and food from the farming sector.

Some farms maybe in positions to deliver additional services from their land and to create new incomes. For example, providing flood storage to hold water back or by developing nutrient and carbon trading but there is a need for investment in infrastructure, capital items, skills and software tools to support this transition.

### **Impacts of Climate Change - what we need to plan for?**

Farmers will need to plan for many issues related to a changing climate. In brief the following are likely issues:

- Warmer Summers
  - Heat stress to poultry and livestock
  - Increased risk of disease in crops
  - Altered growing seasons
- Drier summers
  - Increased drought
  - Reduced stream flow and water quality
  - Serious water stress
  - Decreased crop yields
- Wetter, milder winters
  - Increased winter flooding
  - Risks to livestock
  - Waterlogged soils
  - Reduced ability to access land
  - Reduced ability to over winter stock outside
  - Increased soil erosion particularly from bare arable sites; reduced crop yields; possible destocking
  - Damage to soil structure
  - Timings of sowing and harvesting negatively affected with failure to plant or harvest crops
  - Reduced working days
  - Reduced out grazing days
- Rising sea levels
  - Loss of productive land due to:
    - Increased coastal flooding
    - Inundation of land
    - Increased erosion
    - Salination of freshwater
- Flooding from extreme events throughout the year
  - Loss of crops to flooding; deposits of sediment onto land

- Risk to animals
- Loss of land due to erosion/ permanent flooding; loss of arable land due to flood risk

### Addressing the Climate Emergency

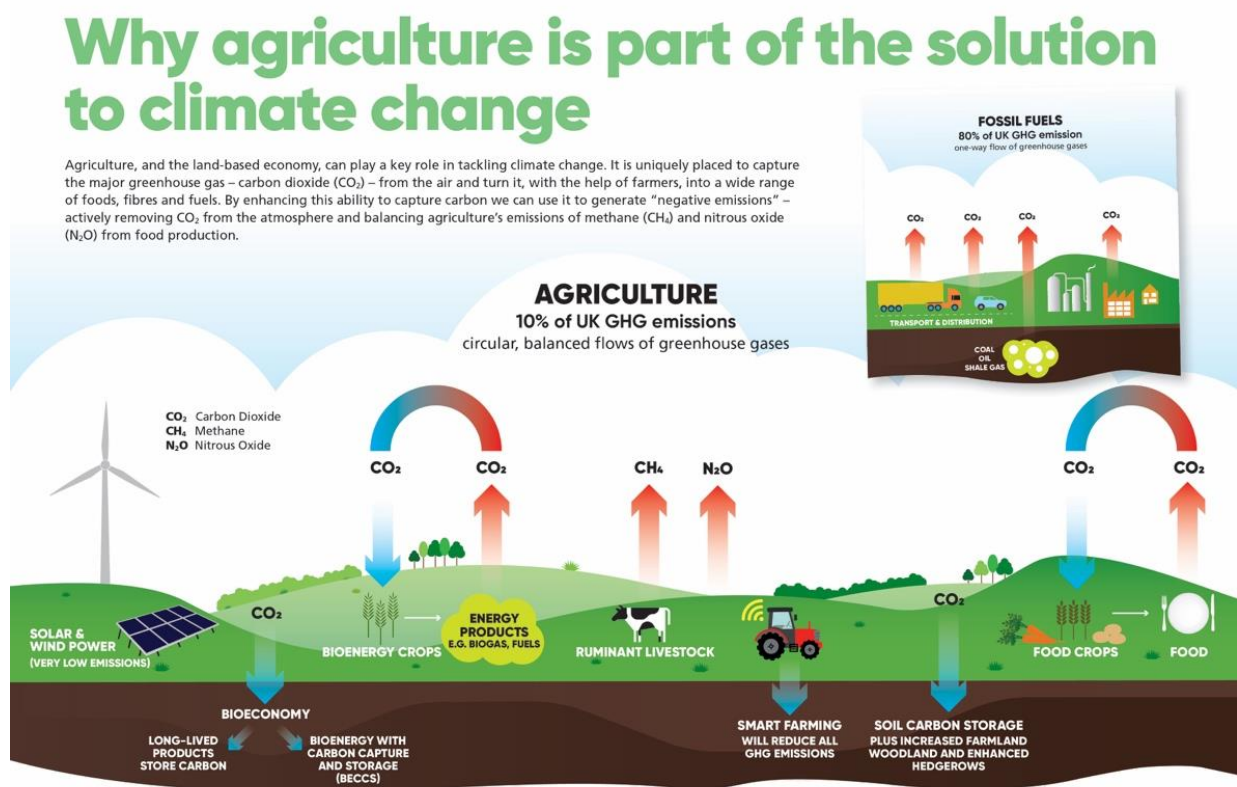
Somerset is well placed to be a national lead for 'Net Zero' for farming. There is a strong farming base, as well as a history of innovative delivery on the ground for areas such as soils and flood management. Below is an outline of the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis for the agricultural sector for climate change and 'Net Zero'. A more detailed SWOT analysis for Somerset is required and, in addition, there is a need for PESTLE (political, economic, social, technological, legal and environmental) analysis.

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• A mixed farm base for cooperation</li> <li>• Underpinned by grassland</li> <li>• Hedgerows</li> <li>• Renewables – a good base</li> <li>• Maritime climate – wind energy</li> <li>• Sunlight hours (production &amp; renewables)</li> <li>• Appetite to engage in 'Net Zero' and climate change</li> <li>• Existing tree stock</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Hard to engage all producers</li> <li>• Distance to market</li> <li>• A mix of supply chains</li> <li>• Infrastructure (inc. grid connections/capacity)</li> <li>• Inadequate tools for baselining (esp. sequestration)</li> <li>• Lack of R&amp;D investment</li> <li>• Lack of funding for productivity measures</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Small woodland blocks</li> <li>• Capacity of hedgerows</li> <li>• Use of less productive land</li> <li>• Agriculture Bill</li> <li>• Environment Bill</li> <li>• Beyond 'Net Zero' a market for offsetting</li> <li>• Engaging consumers &amp; communities positively with farming</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Lack of profitability</li> <li>• Imported food at lower cost &amp; standards</li> <li>• Reluctance to take "first offer"</li> <li>• Lack of funding to encourage 'Net Zero' activity</li> <li>• No agreement on measuring 'Net Zero' for the sector</li> <li>• Monetising Net Zero – appetite externally (pressure to give away for free)</li> <li>• Stewardship schemes ending</li> <li>• Unsupportive regulation</li> </ul>

## The role of farmland for carbon sequestration

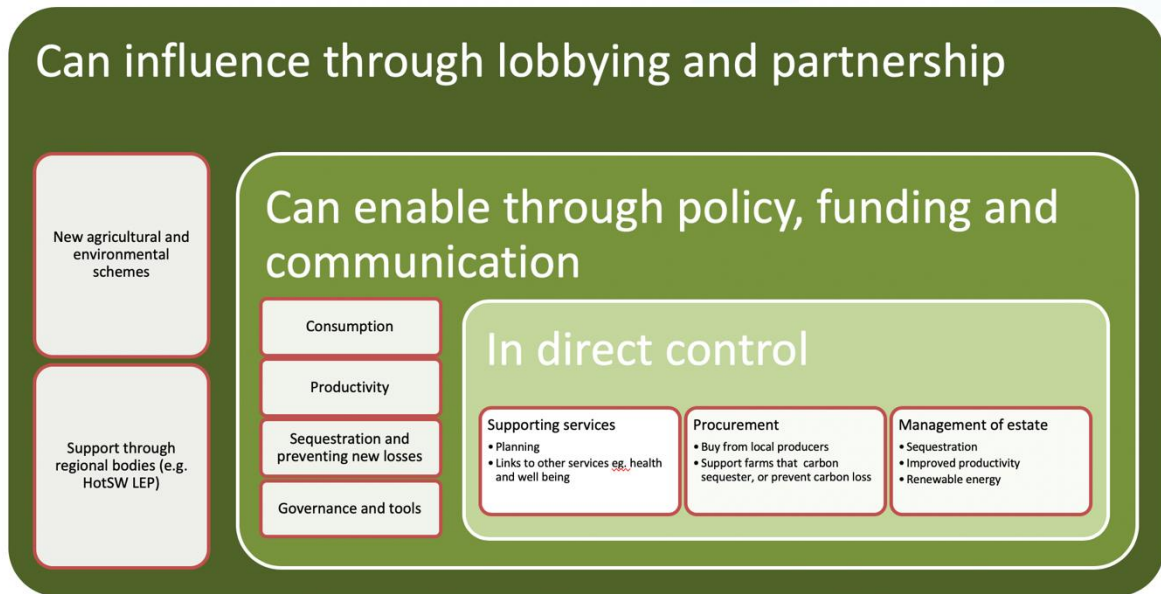
Agriculture, in Somerset, is uniquely placed to be part of the solution as both an emissions source and as a carbon sink. Farmers have a special role to look after carbon reserves already in our soils and vegetation. As such there is considerable importance on ensuring that existing pastoral systems involving livestock are maintained and enhanced.

Agricultural GHGs are very different from other sectors of the economy as methane and nitrous oxide are the main greenhouse gas emission produced. Most other sectors of the economy emit carbon dioxide from fossil fuel use as the main source of emissions. The diagram below, produced by the NFU shows the complex nature of food production, land type and carbon emissions and sequestration.



## The role of Somerset Local Authorities in agriculture and Climate Change

There is considerable scope for Local Authorities in Somerset to support agriculture to deliver Net Zero, and continue to produce high quality food, and enhance the environment. The diagram below illustrates the potential tiers of influence and activity for Local Authorities.



Taking a 'whole systems' approach that looks not only at the impact of production but also consumption is essential. The Local Authorities can show leadership in this through procurement based around Defra's balanced score card for public food procurement and promoting this approach within the private sector. This can work alongside promoting healthy and climate-friendly and nature-friendly choices to residents.

Learning can come from the work set out in the Bath and North East Somerset Local Food Strategy<sup>3</sup>, the work currently being developed around a local food strategy for Gloucestershire<sup>4</sup>, building on the ambitions of the Somerset Growth Plan<sup>5</sup> which includes the food sector as an important element of the Somerset economy.

These approaches lead towards an ambitious and more joined up approach through the established Dynamic Procurement Systems<sup>6</sup> approach as a way to bring finance from the public and private sectors to support the adoption of measures on farm that will help address the climate and ecological emergencies.

By sourcing public goods from a range of departments and agencies at a local and national scale, alongside private finance, whether for food procurement, flood risk mitigation, biodiversity, carbon storage, energy or health services, these income streams can be 'stacked' to provide multiple services. This creates an opportunity for the agricultural sector at a local level to continue to grow through the provision of jobs and the delivery of public goods that will benefit the health of Somerset's landscape, wildlife and residents.



## Farming & Food Sector Outcomes

No.	Sector	Outcome	Outcome Delivered by?	Which Goal Outcome Supports	Timescale Short, Medium or Long Term	Secondary Benefit(s)
1	<b>Farming and Food</b>	The overall Agricultural Sector emissions are reduced to 'net zero' by 2030.	Local Authorities, Businesses, Industry & Agriculture & Residents	2	Short to Medium Term	Environmental, Economic & Societal benefits,
2		Significant Growth of the local food economy with a greater number of local farm businesses supplying to local markets, businesses and public sector including Somerset Local Authorities.	Local Authorities, Public Sector organisations, Businesses, Industry & Agriculture and Delivery Partners	1(a), 1(b) & 2	Short to Medium Term	Economic & Societal benefits, Heath & wellbeing benefits, Local employment and Supply of quality local produce
3		Somerset residents making informed purchasing decisions which reduce the impacts on the environment, support healthy, lower carbon intense diets and locally sourced products and produce	Local Authorities, Businesses, Industry & Agriculture & Residents	2 & 3	Short, Medium & Long Term	Environmental, Economic & societal benefits, Heath & wellbeing benefits, Supply of quality local produce
4		Farm businesses have transitioned to farm practices with lower greenhouse gas emissions, enhanced environmental and biodiversity benefits and are better adapted for the impacts of climate change	Businesses, Industry & Agriculture and Delivery Partners	2 & 3	Medium & Long Term	Environmental, Economic benefits & societal benefits, Heath & wellbeing benefits,
5		Farmers have adapted their means of production to support the supply of both, local, regional, national and international markets whilst minimising their greenhouse gas emissions	Businesses, Industry & Agriculture and Delivery Partners	2 & 3	Medium & Long Term	Economic and Environmental benefits

6		Local communities are more engaged in food production and the impact of sourcing local food of reducing climate change	Local Authorities, Businesses, Industry & Agriculture, Delivery Partners & Residents	2 & 3	Medium & Long Term	Environmental awareness raised
7		The carbon sequestration and storage potential of Somerset's landscapes (including soils, biomass, coastal areas, hedgerows, etc) are fully mapped and evaluated and land management measures have been adapted to maximise this resource to cut carbon emissions across Somerset	Local Authorities, Businesses, Industry & Agriculture, Delivery Partners	2 & 3	Medium & Long Term	Increase in biodiversity & habitat, improvements in land management, greater resilience

## **Benefits and Opportunities Farming and Food**

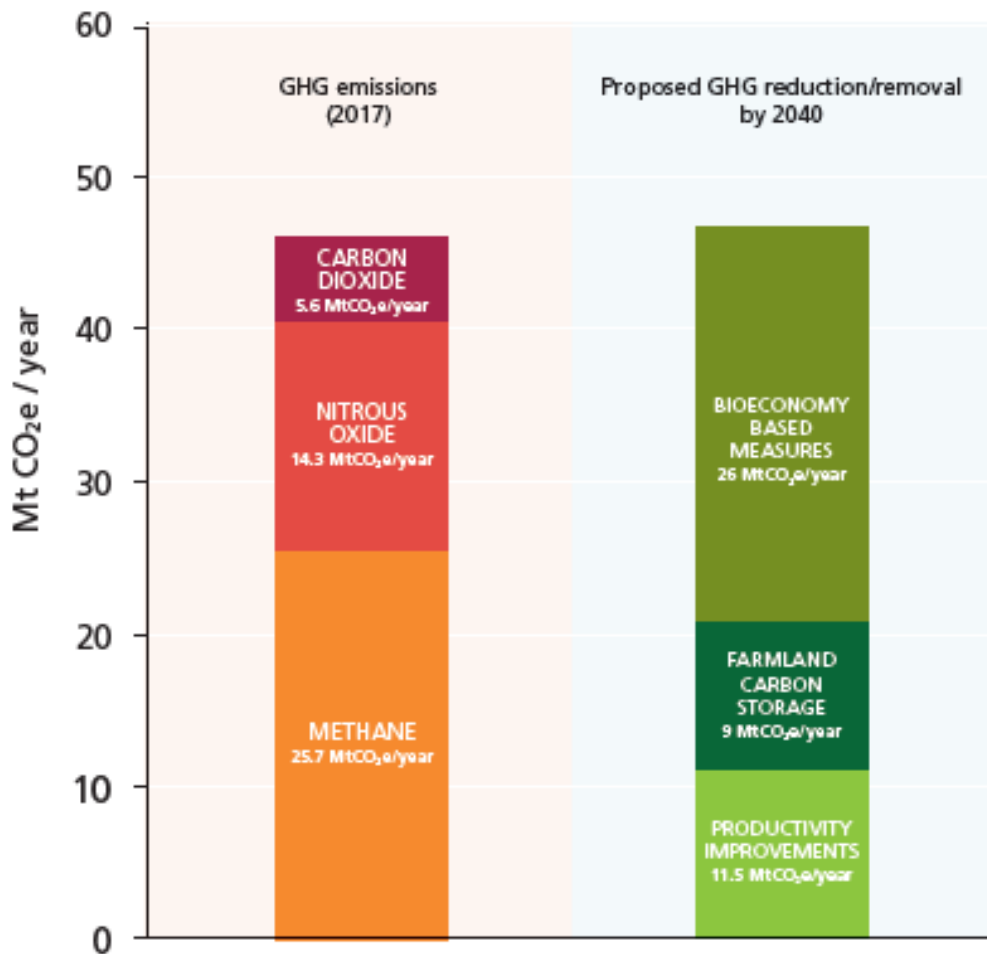
Despite the current uncertainty within the farming sector around Brexit, future UK trade agreements and the implications, opportunities and challenges of the Agriculture and Environment Bills, there are a number of certainties that mean action can now be taken to ensure the farming and primary food producing sectors in Somerset remain viable, resilient and able to benefit from future changes to our climate.

The agricultural sector is very much part of the solution to decarbonising the UK economy. The NFU's recently published Strategy "Achieving Net Zero Farming's 2040 Goal" states how Agriculture, and the land-based economy, can play a key role in tackling climate change. It is uniquely placed capturing carbon dioxide (CO<sub>2</sub>), from the air and utilising it, with the help of farmers, to produce a wide range of crops, foods, fibres and fuels. By expanding this 'carbon capture' opportunity, it is possible to positively contribute to removing harmful emissions from the atmosphere and balance out agriculture's emissions of methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) from food production.

The NFU Strategy sets out 3 *Key Themes* which describe the opportunities and benefits derived through changes in Farming Policy and Practice:

- Improving farming's productive efficiency to reduce our greenhouse gas emissions – will enable farming to produce the same quantity of food, or more, with less inputs in smarter ways
- Farmland carbon storage in soils and vegetation – improving land management and changing land use to capture more carbon, through the provision of more extensive hedgerows and woodland, and providing more carbon-rich soil will have a positive benefit to the environment in locking up harmful emissions but also at a wider landscape, biodiversity and societal level along with conserving existing carbon stores in grassland and pasture.
- There is a significant opportunity to boost renewable energy and the bioeconomy to displace greenhouse gas emissions from fossil fuels and to create greenhouse gas removal through photosynthesis and carbon capture. The benefit will be to remove carbon dioxide from the atmosphere through the development of bioenergy and through bio-based materials such as hemp fibre and sheep's wool.

The graph below shows the direct emissions from UK agriculture, i.e. those from practices on farm, it does not account from indirect emissions from supporting industries such as the manufacturing of fertiliser. It highlights the significance of the contributions methane and nitrous oxide emissions make to this sector compared to CO<sub>2</sub> emissions unlike other sectors of the economy.



Current (2017) agricultural emissions balanced against potential GHG reduction through productivity measures and GHG removals by various methods

The green column shows the pillars under which Net Zero can be achieved through improved productivity and efficiency, carbon sequestration in habitats and soil and the contribution from new technologies within the bioeconomy such as carbon capture and storage and the production of carbon-based products for construction. Overall, under these three pillars, emissions of 45.6 MtCO<sub>2</sub>e/year could reduce, offset and counterbalance against current agricultural emissions

In the longer term, it is possible that the application of biochar – powdered charcoal – to soil and accelerated mineral weathering could deliver further reductions, although these processes will require further evaluation and approval before use.

Enhancing and developing more extensive hedgerows could deliver GHG savings of up to 0.5 MtCO<sub>2</sub>e/year nationally This will require the inclusion of hedgerow management in the Environmental Land Management Scheme (ELMS); the promotion

of hedgerow options in Championing the Farmed Environment (CFE); and support from Defra and Treasury for carbon pricing.

In 2020, the Somerset Rivers Authority (SRA) offered funding to local farmers to implement different methods of natural flood management to help with flood prevention. These include hedge planting, better maize management, and grassland subsoiling and slitting, all measures that help to slow the flow of water through the ecosystem while delivering other benefits to the land and environment. Continuing such investment could continue to provide valued services to the County.

Developing local markets, supporting shorter climate friendly supply chains and improving links between the local farming sector, consumers & local communities will make a positive impact on the local food economy whilst supporting farming businesses. This in turn could lead to a growth in local vegetable and fruit growing, horticultural production, dairy and livestock, and provide, longer term, a safeguard to food security.

Improved on-farm recycling will save money, reduce energy on sourcing and processing new raw materials and cut carbon emissions and provide new markets and business opportunities from Somerset's farming by-products whilst preventing waste products entering waterways and the environment helping to protect local ecosystems and wildlife

The SW Agriculture Strategic Framework,<sup>7</sup> developed by the South West NFU as part of the recovery plan for the sector as a result of Covid 19, has many principles and priorities that are relevant to the Somerset Climate Emergency. The priorities are:

1. Adapting to the risk of Covid 19 on farms and within the supply chain
2. Creating better access to markets and new opportunities
3. Enhanced business and environmental support
4. Developing a more adaptable and skilled workforce
5. Creating dynamic and resilient supply chains
6. Stronger regional and county alignment, coordination and governance
7. Embedding science, technology and innovation
8. Integrated regulation, policy and standards
9. Integrating information and data capture and management into businesses and decision making
10. Improved communication

Linking the work of the Food and Farming workstream with the protection of the Natural Environment is key to communicating the ambitions of the county and achieving the change required. This will be achieved through joint working in the development of a Land Use Strategy and Local Nature Recovery Strategy.

## **Challenges and Barriers to delivery**

Achieve the combined goals of the climate and ecological emergencies will require many challenges and barriers to delivery to be overcome.

### *Hard to engage all producers*

Engagement and action by all producers is required to achieve the ambitions of the Strategy. This requires a wide range of approaches through group events, sharing of online and written material and one to one advice. Working with existing supply chains and producers' groups provide an easy route to engagement but will only reach a proportion of producers in Somerset. To achieve maximum engagement with producers, partnership working promoting a common message through local networks, charities and government and non-government organisations will be required. This includes the following;

- Exmoor Hill Farming Network
- Farm Community Network (FCN)
- Royal Agricultural Benevolent Institution (RABI).
- National Farmers Union (NFU)
- Farming and Wildlife Advisory Group (FWAG)
- Somerset Wildlife Trust (SWT)
- Exmoor National Park Authority
- Internal Drainage Boards
- Bath and West Society
- Bridgwater agricultural society
- Parish and district councils
- Agricultural consultancies and land agents

### *Farm economics and market*

Distance to market is a limiting factor on the cropping choices of farmers. In order to produce a more diverse range of crops, local markets/processors are often required to minimize transport costs and to maintain quality.

There is a mix of supply chains within the farming sector. Some farm businesses have direct relationships with the supply chain either through dedicated contracts or as part of producer groups. These can provide more stable prices and often include requirements to undertake actions such as calculating their carbon footprint.

Those farmers who sell through livestock markets or through short term contracts are less likely to be influenced through the supply chain and can be more vulnerable to market pressures and can make influencing change more difficult. For many in the livestock sector a lack of viability makes it difficult for businesses to raise capital to make changes to their business and access new markets or deliver public goods. This also creates the potential for grassland to be converted to arable production in response to these pressures.

Future trade deals could have a significant impact on the market value of agricultural products and is a major driver in business decisions. Imported food at lower cost & standards could lower market prices for produce and further impact the low profitability of many farm businesses.

In addition, many farmers are tenants and short land tenure agreements can drive short-termism in management decisions and restrict a tenants' abilities to invest meaning that their ability to act on climate change is limited.

#### *Funding and Infrastructure (including grid connections & capacity)*

Access to the grid can often limit the technologies a farm can invest in, whether that is to be able to export energy produced through on farm renewables or investing in more energy efficient equipment that may require three phase electricity.

Access to high speed broadband can also restrict businesses' ability to adopt emerging technologies. There is also a lack of R&D investment and funding (small capital grants) needed to support farmers trialing, or investing in, innovative technologies to cut emissions and find climate ready solutions. Often these technologies are not viable due to economic pressures the businesses are under or are 'new to market' and not yet in widespread use. Such grants are then invaluable in supporting and encouraging behaviour change within the sector.

With current agri-environment schemes ending, it is essential that the future Environmental Land Management (ELMS) scheme is well funded and that farmers are supported in the transition towards the approach of public money for public goods. This is at the core of the future scheme and as is set out in the 25-year plan for the environment<sup>8</sup>. Uncertainty as to what future grant system will exist in the future alongside the phasing out of the existing Basic Payment Scheme<sup>9</sup> has resulted in businesses holding back on investment until they have more certainty of future income streams.

#### *Baseline carbon footprinting*

There are a range of tools available to farmers to undertake baseline monitoring of their carbon emission and to help benchmark change. Uncertainties within the data and a lack of scientific data to support monitoring of measures such as carbon sequestration in soils make it very difficult for farmers to demonstrate the positive impact of the actions taken to reduce their carbon footprint.

Emissions factors for farming practices set at a national level also do not often reflect individual farms, making it difficult to make a true comparison of different farming methods and therefore inform changes to management practices. Engaging and supporting research to develop verifiable methods for assessing carbon in soils and habitats, and the influence of diet and breeding on livestock emissions, is key for

producers in Somerset and the rest of the UK wanting to understand the greenhouse gas emissions impact of their business and wanting to enact change.

### *Regulation*

Developing local and national planning policies that support businesses making appropriate investment in measures such as renewable energy and farm infrastructure to help businesses reduce emissions and become more efficient and resilient will be a key step to help businesses in the sector transition to a carbon neutral future.

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