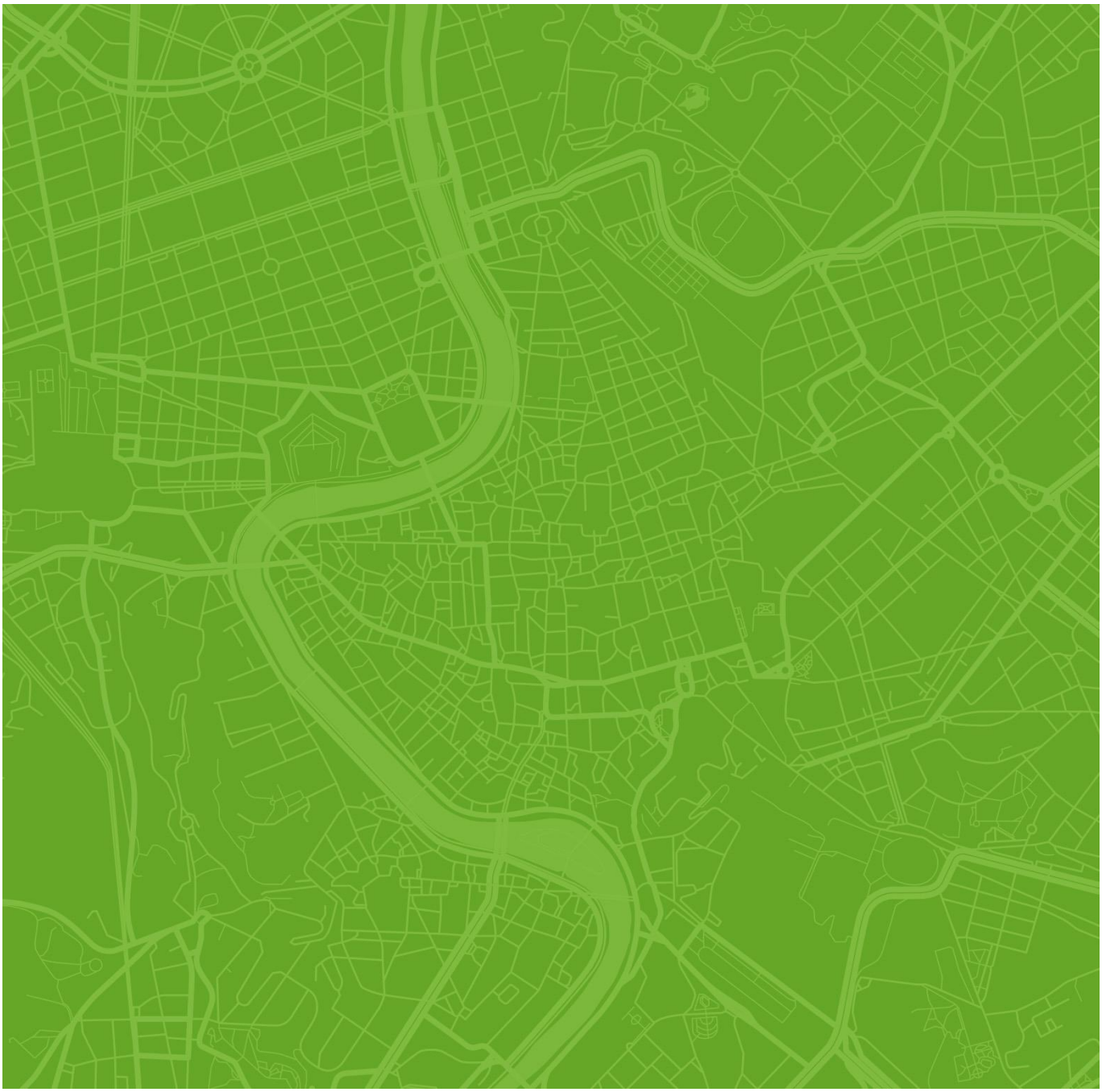
Scottish Government

Partial Business and Regulatory Impact Assessment

Scottish National Adaptation Plan

Draft report
Prepared by LUC
January 2024



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Partial Business and Regulatory Impact Assessment
Scottish National Adaptation Plan 3

Version	Status	Prepared	Checked	Approved	Date
1.	Draft	Tobenna Uzuegbunam Peter Baker	S Underwood	S Underwood	29.01.2024

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Chapter 1
Introduction

1.1 The Scottish Government recommends distinct groups to be consulted on the impact of any proposed legislation, including within government, public, and businesses. This partial BRIA relates to the Scottish National Adaptation Plan 3 (SNAP3). In undertaking this BRIA, we have followed the BRIA toolkit, published by the Scottish Government. The toolkit provides guidance on how to complete a BRIA using the BRIA template, which has informed the structure of this document.

1.2 The BRIA provides an understanding to interested parties of;

1. why the government is proposing to intervene;
2. options the government is considering, and which one is preferred;
3. how and, to what extent, new policies may impact on them, on business and on Scotland's competitiveness;
4. the estimated costs and benefits of proposed measures.

1.3 The tests included in this BRIA are as follows:

- Regulatory and EU Alignment Impacts
- Scottish Firms Impact Test
- Consumer Impact Test
- Digital Impact Test

1.4 The tests excluded in this BRIA are as follows:

- Legal Aid Impact Test
- Test Run of Business Forms

1.5 The remainder of this BRIA is structured as follows:

- Chapter 2 – Purpose and intended effect
- Chapter 3 – Consultation
- Chapter 4 – Options
- Chapter 5 – Sectors and group affected
- Chapter 6 – Costs and benefits
- Chapter 7 – Tests

- Chapter 8 - Enforcement, Implementation, summary and recommendation.

Chapter 2
Purpose and intended effect

Title of proposal

2.1 Draft Scottish National Adaptation Plan 3 (SNAP3).

Background

2.2 Scotland is already experiencing the effects of climate change, such as warmer summers and wetter winters. It is estimated that climate change already costs the Scottish economy billions of pounds every year. Climate projections for the next century indicate that these trends will not only continue, but intensify. Adapting and building resilience to the impacts of climate change will be necessary, alongside our actions to reduce emissions.

2.3 The Climate Change (Scotland) Act 2009 requires the preparation of strategic programmes for climate change adaptation as soon as reasonably practicable after each round of UK Climate Change Risk Assessment(Scottish Government, 2009).

2.4 The Climate Change Committee state that “Scottish businesses are already impacted by climate change; business activities can be disrupted by flooding, storms and coastal erosion, and are at risk of reduced water availability and higher temperatures in working environments. Businesses are also exposed to infrastructure failure because of extreme weather, and supply chain disruptions both domestically and abroad.” (Climate Change Committee, 2023).

2.5 Flooding and extreme weather events which damage assets and disrupt business operations are likely to pose the greatest risk to Scottish businesses now and in the future. New regulation or other government intervention made necessary by climate change could have implications for businesses.

2.6 The Business Insights and Conditions Survey (BICS) 2023 provides some insights into how businesses in Scotland are planning and assessing the effects of climate change on their operations (Scottish Government, 2023a). In the Wave 88 edition of the dataset, the BICS asked businesses about the climate risks they have assessed. The most common climate risks that had been assessed were supply chain disruption and distribution (15.6%), increased flooding (6.2%) and temperature increases (4.4%). However, an estimated 60.6% of businesses reported that they had not assessed risks for any of the specified effects, and 19.1% were not sure.

This suggests that the majority of businesses in Scotland have not prepared for the impacts of climate change on their operations.

2.7 Furthermore, the BICS asked businesses that have assessed climate risks about the adaptation actions they have taken. In line with the risks assessed, the top three effects of climate change that businesses have taken action to adapt to were; supply chain disruption and distribution (26.5%), increased flooding (11.5%) and temperature increases (5.7%). An estimated 21.2% of businesses reported that they had not taken action to adapt to any of these effects, and 44.2% were not sure. This suggests that many businesses have not yet taken adaptive action, despite being aware of climate risks.

2.8 With this in mind, SNAP3 will provide the framework that will aid businesses in Scotland adapt to the anticipated changes in climate and the risks that this will bring. Developing greater climate resilience will ensure that future economic damages are accounted for in the strategic objectives and plans of businesses throughout Scotland, negating some of the impact of climatic events. This BRIA is important as it will help the Scottish Government to understand the potential effects of SNAP3 on businesses throughout Scotland – both positive and negative. This will help the Scottish Government to shape the final policies of SNAP3, ensuring that any negative effects are considered and positive effects are reinforced.

Objective of SNAP3

2.9 A changing climate means both costs and economic opportunities for Scottish businesses. SNAP3 aims to focus on how Scotland can build resilience to the economic impacts of a changing climate and take advantage of the economic opportunities. The objectives included in SNAP3 will support Scotland's just transition to a climate resilient, net-zero economy. This will complement Scotland's National Strategy for Economic Transformation, which sets out the priorities for Scotland's economy and the actions that need to be taken to achieve to maximise opportunities and achieve the Scottish Government's vision of a wellbeing economy.

2.10 To help achieve this, SNAP3 has been arranged around 5 outcomes on 'Nature Connects', 'Communities', 'Public Services', 'Business and Industry', and 'International Action'. Each outcome comes with its own set of objectives. These objectives define the delivery of adaptation action against each outcome. The objectives provide the structure around which the SNAP3 Monitoring framework is being built.

2.11 Beneath the five outcomes, and the 21 objectives, are the individual policies and proposals. These describe the specific adaptation actions to address the risks and opportunities in the CCRA3. The structure of SNAP3 is designed so every objective can be placed in the context of one of the five outcomes and the relevant risks within the CCRA3.

2.12 Altogether, this structure will allow clear, transparent and accountable reporting on adaptation action during SNAP3 implementation (2024 – 2029).

Rationale for Government intervention

2.13 By law, Scottish Ministers are required to set out an adaptation plan responding to the UK wide 'Climate Change Risk Assessment' (CCRA). A new CCRA is published every five years. The CCRA acts as a common evidence base underpinning adaptation plans in Scotland, Wales, Northern Ireland and the UK Government.

2.14 The third CCRA, or CCRA3 – to which the draft Scottish National Adaptation Plan (SNAP3) responds – establishes 61 risks, and opportunities, from a changing climate.

Chapter 3
Consultation

3.1 This section provides an overview of the consultation that is taking place during the partial BRIA process, as recommended by the BRIA toolkit. Further engagement is planned to take place during the public consultation phase, and further information will be collated following this stage. The final version of the BRIA will be presented following the consultation exercises and will be informed by the findings from the consultation.

3.2 The Scottish Government recommends distinct groups to be consulted on the impact of any proposed legislation including within government, public, and businesses (Scottish Government, 2022).

Within government

3.3 This section details the government agencies, directorates and enforcement bodies consulted to inform the impacts of SNAP3.

3.4 A number of government agencies were involved in the formulation of SNAP3. Consultation within the government consisted of a short survey that was sent to the policy leads from different policy areas that had a significant role in formulating the draft SNAP. Appendix A provides a summary of the questions used for the government consultation exercise. The responses from this consultation will provide further evidence of the costs and benefits of each option. The agencies that responded to the survey are:

- Agriculture and Rural Economy
- ENFOR
- Scottish Procurement and Property Directorate
- Transport Scotland.

Business consultation

3.5 To provide robust evidence for the costs and benefits, engagement with 6-12 businesses and business representative groups is being carried out. The results of this consultation will form the main part of the Scottish Firms Impact Test section of this report and will also contribute to the costs and benefits section of the report. This process is ongoing.

Public consultation

3.6 Public consultation will be undertaken at the same time as the draft BRIA is published for public consultation. We have provided the Scottish Government with a range of questions that will inform consultation with a wide range of stakeholders about their views of the main positive and negative impacts the draft SNAP will have on businesses. A summary of the questions provided can be found in Appendix A.

Chapter 4
Options

4.1 This BRIA is designed to explore the relative impacts of different policy options. As we are undertaking a partial BRIA, opportunities to inform options were constrained. However, the two options that have been considered are outlined below.

Option 1 – Business as Usual (do nothing)

4.2 This option would entail not updating the current Scottish Climate Change Adaptation Programme (SCCAP)

4.3 Under this option, the current SCCAP would not be updated and would be adopted again to meet the legal requirements of setting out an adaptation plan that responds to the UK wide 'Climate Change Risk Assessment (CCRA). Although individual sector policies would continue to develop, there would not be a coordinated whole system approach to climate change adaptation, and the integration of a Scottish National Adaptation Plan would not be achieved.

Option 2 – Implement the draft SNAP

4.4 Under this option, the SCCAP would be updated, and a coordinated, whole system approach would be taken alongside the actions outlined in the SNAP. This will achieve five main outcomes that are set out in SNAP 3.

4.5 **Outcome One: Nature Connects** - Our efforts to address the risks posed by climate change must have nature at the centre. This is because climate change is degrading our natural environment and it must be protected and restored in its own right, but also because nature is one of the best tools we have to adapt to the changing climate.

4.6 **Outcome Two: Communities** - People shape places, and places shape people. The physical, social and economic environment we live in has a big impact on health, wealth and wellbeing. The climate emergency means that Scotland's places are experiencing more frequent extreme weather. Challenges like heatwaves, rising sea levels and localised flooding are affecting our countryside, towns and cities, and we know these changes we are seeing now will only increase in the future. To protect our communities, we need to improve our places to adjust to the effects of climate change, and to reduce our need for coal, oil and gas.

4.7 Outcome Three: Public Services - The public sector is playing a crucial role in delivering action to enable Scotland to adapt to the impacts of climate change. Adaptation also needs to be aligned with a public sector organisation's strategic outcomes and priorities; and with those it contributes to locally. By doing this, adaptation becomes integral to the functions of an organisation and its ability to achieve outcomes. It can also be more efficient, with cost savings made possible when adaptation is delivered as part of business-as-usual rather than an additional activity.

4.8 Outcome Four: Business and Industry - Over the next 5 years, The Scottish Government and the private sector can take action to minimise the scale of the long-term economic costs and harness the market opportunities presented by changes in climate conditions. The National Strategy for Economic Transformation (NSET) sets out a new culture of delivery where partners come together as 'Team Scotland' to deliver the actions needed to transform the Scottish economy. This includes ensuring that businesses are involved in the pursuit of the strategy's ambition of a fairer, wealthier and greener country – a wellbeing economy.

4.9 Outcome Five: International Action - The measures to manage the international risks in the UK CCRA are in many cases beyond the scope of the Scottish Government. However, the Scottish Government is committed to taking all actions within its devolved powers to increase international action and improve domestic resilience to shocks and cascading failures and avoid maladaptation.

Chapter 5
Sectors and groups affected

5.1 This section looks at the sectors and groups most affected and outlines some costs and benefits of the implementing the SNAP option against the baseline option in order to understand the effects of the updated plan on the main businesses and industries within Scotland. This section further informs the cost and benefits section of this BRIA.

5.2 Climate adaptation in Scotland, underpinned by the actions outlined in SNAP3, will have an impact on people and businesses across Scotland. Adapting to a changing climate will require significant investment, for example, in flood management and coastal erosion infrastructure, retrofitting and adapting homes and modifications to the way in which land is used. For businesses in Scotland, climate change is currently affecting operations through the increased incidence of flooding, transport disruption, water shortages, pests and diseases and international supply chain disruption. These issues are set to be exacerbated by predicted future climatic changes. SNAP3 aims to address these issues, facilitating and supporting private sector adaptation through policies, regulation, and measures such as information sharing and raising awareness.

5.3 The sectors and groups affected outlined below cover goods and services addressing the full range of hazards exacerbated by climate change: sea level rise and coastal flooding and storm surges; food insecurity and the breakdown of food systems linked to warming, drought and precipitation variability; inland flooding and the threat to large urban populations; insufficient access to drinking and irrigation water in rural areas and reduced agricultural productivity; systemic risks affecting infrastructure electricity, water supply, health and emergency services; and health risks because of extreme heat, air pollution and disease (Mike Bonaventura, 2018).

5.4 SNAP3 sets out five outcomes which respond to the risks and opportunities from a changing climate as set out in the third CCRA3. This section of the BRIA pulls together evidence and analysis from various sources to provide a high-level assessment of the costs and benefits of the SNAP3 and Scotland's adaptation plans more broadly.

Transport and distribution

5.5 Transport networks are key to driving economic activity and sustaining Scotland's society, supporting the distribution of goods, foods and vital supplies and supporting international trade. Scotland's transport network includes Scotland's railway, roads, airports, canals, and ports and harbours.

5.6 In March 2023, the Scottish transport and distribution sector, made up of transportation and storage sectors, consisted of 15,310 businesses, employed about 101,910 people, and turned over £11,149 million (Scottish Government, 2023b).

5.7 Furthermore, it is estimated that Scotland's transport network supports over £80 billion of trade (Scottish Development International, n.d.). Most of that trade is transported by land and sea – with road freight exports largely to destinations in England and seaport exports internationally.

5.8 Scotland has a variety of hubs and terminals situated across Scotland. The central belt is where many businesses are headquartered, and therefore logistic hubs tend to also service this region. The Transporting Scotland's Trade 2019 Edition (Transport Scotland, 2019) outlines the key transport and logistics hubs in Scotland, along with information on the total volume of trade that passes through each.

5.9 The Highlands & Islands are reliant on ferry services and, in some cases, small aviation operators, to move goods and people intra-island and to and from the mainland. For example, Pentland Ferries daily service between St. Margaret's Hope on Orkney and Gills Bay on the Scottish Mainland is presumed to carry around 80% of all livestock and dangerous goods cargo between the Orkney Islands and the Scottish Mainland (Transport Scotland, 2019). Scotland's seaports also handle international cargo, warehousing and distribution, passenger ferries, and offshore oil and gas services. Scotland's five main airports have international flights that connect passengers to destinations worldwide.

5.10 In summary, the transport and distribution network is integral to the functioning of the Scottish economy. Therefore, avoiding the disruptive effects of climate change through effective adaption is one of the key aims of SNAP3.

Risks

5.11 The transportation and distribution sector has been identified as an increasingly important area of climate risk and adaptation assessment. Climate adaptation for transport and distribution is important for the following reasons:

- There is an increased risk of transport and distribution delays because of more extreme weather events as well as the risk of damage and deterioration of transport and distribution infrastructure from extreme temperatures and extreme weather events.
- Transport infrastructure is at risk of indirect or cascading impacts associated with extreme climate events. Transport and logistic businesses are an essential part of modern society, and damage to this sector could lead to knock on effects on other sectors and part of society.

5.12 For instance, there were, on average, 12 earthwork (embankments and cuttings) failures a year across the rail network in Scotland between 2003 and 2013, a recorded landslip and derailment from severe rainfall resulting in fatalities in 2020, and the upland and mountainous areas (such as the A83 road at the Rest and Be Thankful) are more prone to natural slope failures and landslides. These landslides have been estimated to cause direct costs (such as emergency response and remedial works) between £400k and £1.7m, with direct consequential costs (associated with loss of utility of infrastructure) between £180k and £1.4m for single landslip events in Scotland (Sniffer, 2021).

Opportunities

5.13 An uptake in funding, investment and policy development into nature-based solutions can mitigate the risk of damage to transport infrastructure. There is limited data to compare the benefits to the transport and distribution sectors, however, available research suggests that nature-based solutions can mitigate the impacts of extreme weather, flooding and rising temperatures (Biasin et al., 2023), which is considered a very high risk for transport networks according to the Evidence for the third UK Climate Change Risk Assessment (CCRA3) (Sniffer, 2021).

Farming, fishing and forestry

5.14 Scotland's agriculture, forestry, fishing, and aquaculture sectors are of central importance to many communities, and our economy. Combined, these industries contribute around £2.6 billion a year to the Scottish economy. In 2023, Scotland's agriculture, forestry and fishing sector comprised of 17,295 businesses, employed about 56,920 people, and turned over £7,278 million (Scottish Government, 2023b)

5.15 Many of these jobs are located in rural areas, and act as a cornerstone to these rural communities. According to the Inter Departmental Business Register 2020, the 'Agriculture, forestry and fishing' sector employs the most people in rural Scotland, accounting for 15% of workers in remote rural areas compared to 12% in accessible rural areas and 0.5% in the rest of Scotland (ONS, 2023).

5.16 Adaptation action by these industries is needed to maintain business productivity and viability, over the next 5 years.

Risks

5.17 As they rely on natural resources, these will be one of the sectors most directly impacted by changing climate conditions. The farming, fishing, and forestry sectors are potentially vulnerable to climate change because of water stress, soil health, impacts on biodiversity, temperature changes, and extreme weather events. The growing incidence of pests, diseases, and invasive species can also impact food and fuel productivity and carbon stores which have significant implications for the competitiveness and profitability of the farming, fishing, and forestry sectors, and associated sectors such as the food and drink industry. This has further implications for food security and the health and wellbeing of consumers.

Opportunities

5.18 The impacts of climate change can also impact the demand and supply for agricultural products through changes in availability and consumption patterns.

5.19 Scotland has the potential to become a global leader in sustainable and regenerative agriculture. This includes research in the following areas that could bring a range of new opportunities for the rural economy in Scotland:

- research on important Scottish crops, to produce varieties which are resilient to a combination of environmental stresses and use resources more efficiently. It will also develop novel crops and cropping systems for increased agricultural adaptability.
- livestock research to support the development of feeding and breeding strategies for climate adaptable and resilient livestock, along with data driven innovations for improved sustainability.
- partnering with innovators to explore further opportunities for the best use of aquaculture by-products, including processing waste, organic waste, mortalities and harvested cleaner fish.

Accommodation and Food and Drink services

5.20 The accommodation and food services sector is a major contributor to Scotland's economy, generating a turnover of around £7,782 million in 2023. The sector is made up of about 19,450 businesses, which employ around 205,140 people, many in remote and rural and island communities (Scottish Government, 2023b).

5.21 Furthermore, the food and drink industry is a major contributor to Scotland's economy, employing about 48,000 people, about 1,285 food and drink manufacturing businesses, and an annual turnover of around £10.3 billion, accounting for 33% of Scottish manufacturing (The Food & Drink Federation, 2023). The industry is reliant on agriculture which is particularly exposed to disruption from extreme climate-related events and long distribution networks

Risks

5.22 Impacts such as temperature changes, the increased risk of pests and diseases, and extreme weather events, can impact the availability and quality of food and drink resources from impacts to productivity. Warmer temperatures have implications for longer crop growth and livestock to be outdoors, presenting possible opportunities for Scotland's agricultural sector. However, the growing season is likely to be disrupted by heat stress and reduced summer precipitation. Climate change internationally could also have an impact on food supply, prices and quality.

5.23 For businesses and consumers, impacts to food and drink productivity can cause price volatility as prices could rise 20% by 2050 on average, alongside food insecurity, and reputational damage (Sniffer, 2021). The impacts of extreme weather events on transportation and distribution networks can also cause supply chain disruptions resulting in knock on effects for the food and drinks industries.

5.24 With regards to accommodation, extreme weather events have the potential to damage property and infrastructure resulting in potential insurance costs as well as costs of retrofits. There are particular risks to coastal communities with 19% of Scotland's coastline at risk of erosion within the next 30 years. For instance, the four most severe coastal flooding events affected Scotland between 1928 and 2013. Under a 2°C by 2100 warming scenario annual damages from flooding for non-residential properties across the UK is expected to increase by 27% by 2050 and 40% by 2080, at 4°C this increases to 44% and 75% respectively (Sniffer, 2021).

5.25 Additionally, the risk of excessive moisture from temperature changes and structural damage from extreme events is cause for concern along with the risk of increases in cooling demand in summer months.

Opportunities

5.26 However, opportunities exist from decreases in heating demand during winter which can be beneficial to businesses and people. There is also a potential opportunity for increases in the demand for climate resilience infrastructure.

Financial and insurance services

5.27 According to Scottish Financial Enterprise (SFE), the financial industry in Scotland contributes the following to the Scottish economy (SFE, n.d.):

- The sector is the biggest sectoral contributor to Scotland's economy, representing £13.6 billion or 9.2% of GVA
- Scotland's financial and related professional services sector is a significant employer, employing 160,000 people – around 9% national employment
- There are around £690 billion of assets under management in Scotland, investing in the economy and helping people to save for retirement.

5.28 The financial services sector has an important role in supporting the transition to a climate resilient, net-zero economy – by effectively assessing climate-related risks and by helping individuals and communities adapt to the effects of climate change through how they invest, lend and insure businesses.

Risks

5.29 The climate risks that the finance and insurance services face mainly include the increased degree of risk within their lending portfolio. Financial lenders face the risk of defaults because of the impact of extreme weather events on businesses and personal customers. Insurers face the risk of higher claims for similar reasons.

5.30 There is no publicly available data on insurance coverage and premiums for businesses relating to climate risks. This means it is not possible to assess the extent to which climate hazards are impacting businesses' ability to access insurance in Scotland.

Opportunities

5.31 The financial industry in Scotland can play a huge role in providing funding and support for sustainable infrastructure, renewable energy and other climate adaptation initiatives. Financial institutions in Scotland have the opportunity to access new markets and channel financial flows into adaptative measures.

5.32 Furthermore, investment in nature requires innovation in market-based approaches, to unlock the scale and size of investment needed. As outlined in NSET, the Scottish Government is establishing a values-led, high-integrity market for responsible private investment in natural capital building on the existing Woodland Carbon Code and Peatland Code.

Chapter 6
Costs and Benefits

6.1 This section provides an overview of the anticipated costs and benefits of each option considered. Currently, this is based on the available literature. It will be further developed once the results of the consultation exercise are confirmed.

Benefits

6.2 The assessment of benefits considers benefits of both options outlined in the 'Options' section of this report, including business as usual (option 1) and the benefits of implementing the adaptation outcomes of the SNAP3 (option 2).

Option 1 – Business as Usual (do nothing)

6.3 Under this option, it is not anticipated that there will be additional benefits beyond the benefits of the current SCCAP2 that relate to the intended objective. It is also anticipated that there could be a plateau or decline in the scale of benefits from the current SCCAP2 as climate change accelerates, with impacts out pacing current information and actions. Furthermore, failure to update the current SCCAP2 would lead to Scotland not complying with the 2009 Climate Change Act.

Option 2 – Implement the draft SNAP

6.4 Under this option, it is anticipated that there will be benefits from the implementation of the outcomes of the SNAP3. The benefits associated with this option have been drawn together from available evidence and analysis from sources to provide high-level estimates of potential benefits.

6.5 It is anticipated that early adaptation will deliver high value for money (Watkiss, 2021). According to an initial review of the benefits of adaptation for the CCRA3, early adaptation investments will lead to economic benefits in addition to important social and environmental co-benefits. The review states that the benefit-cost ratios typically range from 2:1 to 10:1.

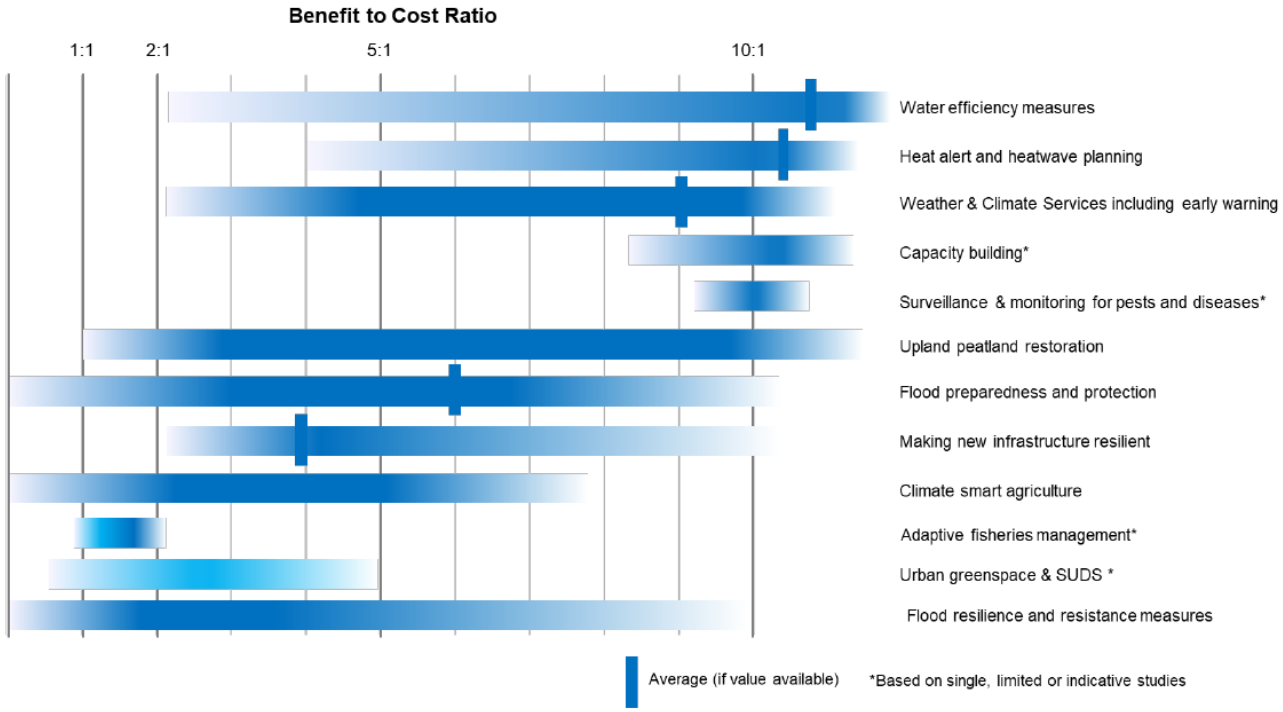

Figure 6.1: Benefit to Cost rations for Adaptation for Selected CCRA3 risks. Source: Watkiss (2021).

6.6 However, it is likely that the benefits of adaptation will be long-term compared to the costs of adaption, which are likely to include high initial costs for business and people. A report by Watkiss, (2021) suggests that every £1 invested in adaptation could result in between £2 to £10 in economic benefits. It is important to note that the outcomes of the SNAP3 will have cross-cutting benefits and co-benefits, such as reducing losses from delaying adaptation, which make climate change harder to tackle in the future, potential economic gain, social, and environmental benefits.

Outcome One: Nature Connects

6.7 It is anticipated that actions to promote blue-green infrastructure (BGI) and investment will reduce the risk of flooding for businesses and related infrastructure within Scotland's built environment, as well as create more opportunities for investment in BGI. A city-wide indicative estimation for the potential value of the range of benefits from blue-green infrastructure is provided in a B£ST (Benefits Estimation Tool for valuing the benefits of blue-green infrastructure) case study for Glasgow City Council's surface water management plan (City of Edinburgh Council, n.d.). The tool was used to assess the benefits of delivering SuDS in Glasgow estimated at a total present value (PV) benefit of £70.7 million (before confidence) and £63.1 million (post confidence) for benefits such as flooding, recreation, amenity, water quality, and carbon reduction and sequestration as seen in Figure 6.2.

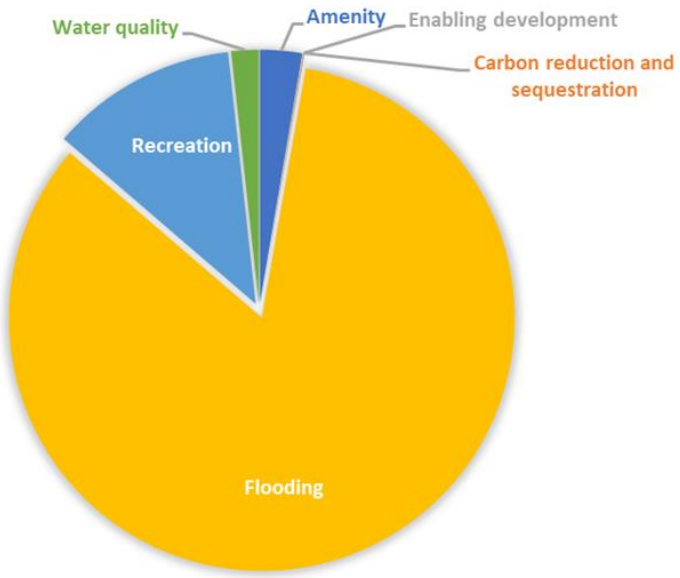

Figure 6.2: Distribution of SuDS benefits in Glasgow determined using B£ST. Source: Adapted from Susdrain, 2019, Glasgow SWMP case study (Susdrain, 2019).

6.8 It is important to note that the benefits to the built environment extend beyond direct impacts to the built environment, having the potential to have benefits for dependent sectors such as transport and distribution, food and drink industries, health and wellbeing, and Scottish businesses. Indicative estimates also show that for every £1 invested in the Edinburgh's parks and greenspaces, there is a generated £12 return in social, economic and environmental benefits (City of Edinburgh Council, n.d.), and estimates also place the removal of air pollution by urban green-blue space in Great Britain at £162.6 million in cost savings for health costs, avoided deaths, and hospital admissions (ONS, 2019).

6.9 There are also anticipated knock-on effects between sectors and groups. For instance, actions to promote nature-based solutions into new transport and distribution infrastructure projects will have benefits for businesses and services dependent on transport and distribution networks. Additionally, there is an opportunity to avoid costs of future retrofitting and adaptation by incorporating climate change adaptation into current planning and design.

6.10 It is anticipated that actions to promote investment and finance BGI and marine restoration will create more opportunities for investment in BGI in Scotland. This will also bring potential benefits for fisheries in the medium term as well as benefits for coastal recreation and tourism business as a result of nature and habitat restoration and enhancement.

6.11 The delivery and uptake of policy, plans and strategies will have direct and indirect benefits on Scotland businesses and sectors. While there is limited evidence on the projected benefits from forthcoming policies like Scotland's new Water and Drainage Bill, according to the UK Government, an investment of £5.2 billion for new flood and coastal defences in England could better protect 336,000 properties by 2027 (Defra, 2020), however, these figures will vary in relation to Scotland. For instance, the new water and drainage bill, Scottish Government's flood resilience strategy, biodiversity and coastal change adaptation plan, have the potential to reduce flood risk for businesses and public infrastructure. Another city-wide estimate shows that at a cost of up to £85 million for interventions to manage future surface water flooding likely including about 15,000 blue-green infrastructure features such as planted water detention basins and bioswales, permeable paving, street planters and bioretention tree pits, verge rain gardens and rainwater downpipe planters, covering a catchment of about 15 hectares, the investment could generate 385 sustainable jobs and provide additional wider benefits at a present value of more than £30 million (Severn Trent, 2021). The benefits include flooding and water resource management, water quality, carbon storage, climate adaptation, amenity and wellbeing, and urban regeneration.

6.12 Modelling suggests a worsening of these risks from more frequent extreme temperatures and extreme weather events. Integrating adaptation and resilience into transport strategies and plans can reduce the risk to businesses, people and supply chains through travel disruptions and the costs of travel disruptions. This also reduces costs to Scotland's transport infrastructure by avoiding future retrofitting needs in the long-term.

6.13 The development of the next land use strategy, the Scottish wild salmon strategy and the land and agriculture just transition plan, will help promote natural functioning landscapes and habitats as well as direct monitoring and assessment of Scotland's salmon which will be beneficial for fishery, agricultural, horticultural and forestry businesses.

6.14 The Scottish Plan for INNS surveillance will help early identification and response beneficial for land and marine based industries, including agriculture, fishing and forestry businesses which will have additional benefits for food security and the wellbeing of Scottish consumers; helping mitigate the risks of pests and invasive species with benefits of increased pest resilience of crops and trees for farmers and foresters. The economic and environmental costs of managing established pests, pathogens and INNS are considerably higher than those of biosecurity measures to prevent them from becoming established. Therefore, SNAP3's policies and actions focusing on enhanced prevention, monitoring, surveillance, and early response are considered highly beneficial. Increased horizon scanning for INNS and improved coordination with international pest risk surveillance organisations would help Scotland manage risks associated with changes in post EU-exit trade and climate.

6.15 Additionally, monitoring and surveillance initiatives can assess opportunities for increases in species populations because of climate change. The CCRA3 states that modelled changes in climate suitability for some bird species showed the largest increases were projected for the north and west, especially in Scotland. As such, it can be assumed that climate change will continue to offer opportunities to some species, which can be explored through monitoring initiatives.

6.16 Planning and climate change guidance and the new National Marine Plan 2 will provide coordinated adaptation frameworks which could close the information gap, and promote evidence-based decision making for flood risk in Scotland's sectors such as the transport and distribution sector, and the marine environment. Similarly, the creation of a Scotland wide Coastal Monitoring programme will also lead to co-ordinated adaptation and improved resilience for coastal industries. Analysis suggests that coastal adaptation is extremely cost effective, able to significantly reduce residual damage costs down to low levels (Sniffer, 2021).

6.17 Policies promoting sustainable practices in agriculture and fishing could make Scottish business more competitive in local and international markets as some businesses are under pressures to adopt more sustainable practices.

6.18 Additional and continued support is crucial for Scotland's businesses, especially small and medium scale enterprises (SMEs). Support from the Scottish Government, through local authorities, in mapping opportunities for land use and nature networks will help local authorities and business understand the impact of land use changes on business operations.

6.19 The Peatland Action Plan and the review of UK Forestry Standard will create opportunities for green finance investment and peatland contractors, as well as the forestry sector.

Outcome Two: Communities

6.20 Continued government support is needed to support the delivery of adaptation measures especially for the most at risk areas.

6.21 SNAP3's promotion, research, funding and investment, and policy development streamline common standards of resilience and bring together local and regional partners for knowledge exchange, potentially increasing preparedness and investment planning to reduce vulnerability. Non-economic benefits can include improved decision-making for businesses however assessments indicate high economic benefits from investing in flood adaptation infrastructure, according to the CCRA3. Collaboration between the Scottish Government and local government will improve public, private, and third sector co-ordination. and action to support private sector adaptation and resilience. This will be achieved through climate delivery frameworks, and wider and improved partnership to deliver the implementation of the place principle with planning and health benefits. According to the World Economic Forum, collaboration between government, businesses, organisation, and public sector bodies through the delivery of partnerships for climate change adaptation can have benefits for adaptation to extreme weather events, sea-level rise, marine protection, biodiversity loss, private sector engagement and the accessibility and affordability of technical innovations (Dong, 2020). Additionally, support for local plans like the Regional Marine Plans will improve marine coordination and action to support adaptation and resilience.

6.22 SNAP3's resilience actions have the potential to support society and businesses become more prepared and better able to respond to climate change and severe weather events.

6.23 Flooding remains the most severe risk for Scotland and the costliest hazard for Scotland's businesses according to the CCRA3. The SNAP3 objectives, such as improving forecasting services and a flood resilience strategy, will have significant benefits in helping public services, and businesses become more prepared and better able to respond to extreme weather events which can help reduce costs associated with disruption and reducing recovery times. Additionally, reducing flood risks in urban areas lowers financial costs, increases security, and makes investments that would otherwise be too vulnerable to climate risks more viable. For example, indicative estimates in a press release for England suggests that an investment of £860 million in 1,000 schemes could reduce flood risk by 11% and protect 336,000 properties by

2027, avoiding £32 billion in economic damages (Defra, 2021). In the case of UK-wide businesses, estimates suggest that further adaptation measures will decrease expected annual damages for non-residential properties. These will decrease by 5% by 2050 and a further 1% by 2080 compared to present day levels of expected damage, under a +2°C at 2100 scenario, by another 5% under a +4°C scenario, and 21% by 2080. In Scotland, however, figures decrease by 32% by 2050 and 27% by 2080 for a +2°C at 2100 scenario (Sniffer, 2021).

6.24 SNAP3 commits to engage with FloodRe to ensure that flood insurance remains affordable to those at risk. Any engagement to ensure flood insurance remains affordable is beneficial for businesses to remain competitive in areas most at risk of flooding through asset protection and reduced operational costs. Furthermore, affordable insurance costs have the potential to foster innovation and growth, as businesses can invest in research and development.

6.25 SNAP3's commitment to preparation and response, including community resilience, can help identify and protect assets at risk of extreme weather events, benefiting forestry businesses, land-based industries, and rural businesses and infrastructure exposed to wildfire risks. The increase in community engagement and education will help promote the risks of wildfires, in turn reducing the risk of economic losses and the potential loss of heritage assets.

6.26 Understanding climate scenarios in relation to British and European building standards could reduce climate related risks and disruption to businesses situated in new buildings. Actions to support climate resilience in new and existing buildings will result in reductions in climate related risks and reduce disruption to businesses located in existing buildings. While resulting measures can result in increased costs for building developers, there are also anticipated benefits to achieving net zero emissions and providing jobs by incentivising the construction sector to increased demand for labour (RICS, 2020). There are also anticipated benefits such as health benefits to homeowners, through the reduced risk of overheating, and the associated lower or avoided treatment costs from overheating, affordability through the potential for lower heating bills, and a reduced risk of flooding in homes for homeowners (UKGBC, 2021). As such, it is likely that early retrofitting measures will be more effective and less expensive in the long run by avoiding related effects to health and social care, as stated in the CCRA3. It is also likely to be more effective and less expensive to address all these risks at the same time through retrofitting (Sniffer, 2021).

6.27 SNAP3's provision of more guidance, support and grant programmes will increase energy measures in buildings in Scotland, including historic buildings and heritage assets.

6.28 Additionally, lower climate risk in new and existing buildings ensures continued and affordable insurance for businesses in at risk buildings.

6.29 With regard to adaptation actions to make the historic environment more resilient, there is a potential for the provision of skills and training in relevant communities. There are also benefits for business located within historic buildings and businesses dependent on the wider historic environment such as tourism businesses, through a more sustainable cultural sector.

Outcome Three: Public services

6.30 Developing guidance on climate change duties and continued support of public sector organisations will improve co-ordination and action for adaptation and resilience measures.

6.31 The enhancement of critical infrastructure and improving the resilience of essential services will have significant benefits for all sectors of the Scottish economy in the face of climate events.

6.32 Actions for a more resilient health and social care system will have benefits for Scotland's economy through a healthy working population and benefits to businesses in the health and social care sectors.

6.33 Design advice for new schools will have medium-term benefits in maintaining an educated workforce.

6.34 An engagement with the UK Government on energy market arrangements has the potential to provide benefits for businesses in the energy sector and Scottish businesses by helping maintain secure and reliable energy supplies.

6.35 It is anticipated that the development of a Trunk Road Adaptation Plan and collaboration with Trunk Road companies to manage disruption risks, will have benefits for supply chains and businesses dependent on the movement of goods and the transport of people through improved adaption and resilience.

6.36 Ensuring Scotland's railway network is up-to-date on adaptation and resilience alongside engagement to support future climate-related specification and development will benefit supply chain networks and businesses dependent on the transports of people and goods.

6.37 Increased promotion, information, guidance on resilience, interventions, and opportunities to Scotland's maritime network and canals, will potentially result in increased climate change resilience resulting in benefits to dependent businesses and supply chains.

6.38 In relation to Scottish waters, securing future service resilience for customers will benefit communities and businesses dependent on water supplies.

6.39 A new National Flood Risk Assessment (NFRA) will help identify flood risk communities, businesses and infrastructure which will improve flood risk resilience and adaptation, and increased promotion and education on flooding will provide information and best practice guidance for at risk businesses and communities. Furthermore, collaboration with organisations will streamline flood risk management nationwide.

Outcome Four: Business and Industry

6.40 SNAP3 objectives to increase the awareness of climate risks, as well as increasing support and advice for business preparedness and resilience, will prompt adaptation across businesses, leading to avoided cost (cost of inaction) associated with climate change and extreme weather events such as flooding, overheating, wildfire, water shortage. SNAP3 aims to increase information dissemination regarding climate change adaptation with businesses. This can attract investment and further research can bridge information gaps regarding the impact of extreme weather events on the built environment, including flooding, extreme temperatures, high winds, and lightning strikes. It is stated in the CCRA3 that the cost of adaptation measures across rail and road networks is usually offset by improvements to repair costs and travel time delays.

6.41 The climate change risk assessment identifies flooding as the costliest climate-related risk to business in Scotland. As such, improved forecasting and flood resilience strategies will help to identify the businesses, communities and infrastructure at risk of flooding, and provide resilience strategies to inform adaptation methods. The adoption of sustainable strategies by local government can lead to beneficial changes to business models along with benefits to people from amenity and sustainable transport infrastructure. For example, climate resilient transport infrastructure will allow new developments to be connected to existing transport infrastructure, such as railways. Incorporating adaptation and resilience in policy and adaptation plans, as well as promoting awareness of interventions and opportunities, has the potential to further reduce risks and inform related businesses and sectors of available opportunities for adaptation.

6.42 Monitoring Scotland's water resources will help provide practical advice to businesses on managing water scarcity, thereby raising awareness and reducing the risks associated with water shortage.

6.43 Actions to provide advice, skills and funding to support Scottish agriculture to take action on climate change adaptation, and research into Scottish crops and livestock will provide longer term benefits as agriculture becomes more resilient to climate change and more able to maintain production and profitability as the climate changes and severe weather events occur.

6.44 Funding research into the impact of climate change and extreme weather events (such as drought and waterlogging) on pests and pathogens of Scotland's economically important crops, will deliver evidence-based strategies for crop protection, providing benefits to the agricultural sector as farmers are more able to avoid the climate-related impacts of pests and diseases. Research and development and better coordination between government and Scotland's sectors could help to mitigate the risk to, and potentially enhance, productivity including integrated soil and water management, habitat restoration, and flood risk management, encouraging innovation and diversification. Investment into research can address productivity gaps and explore synergies that can be delivered through the improved use and management of land such as low carbon farming, improved nitrogen-use efficiency, and enhanced soil quality measures.

6.45 The delivery of the resilience action plan, more adaptation resources and support, and more investment in forest surveillance, has the potential to result in a more resilient forest sector, better able to maintain timber production and profitability as the climate changes and severe weather events occur. SNAP3 will increase investment in nature based solutions for climate adaptation. This will have a positive impact on biodiversity and habitat restoration. This, in turn, will benefit the farming, fishing and forestry sector, food and drink industries, tourism, and businesses that rely on natural resources. CCRA3 modelling results show that the public and private investment required to address the nature finance gap for Scotland of £12.5bn would generate an estimated output effect of £17 billion into the Scottish economy. This means that every £1 invested would generate £1.35 for the economy. In terms of jobs, the potential economic impact could be 146,020 direct and 197,380 direct and indirect jobs created or existing jobs sustained likely in industries such as silviculture, renting and leasing of agricultural machinery and equipment, and support services to forestry and hunting (Sniffer, 2021). Additional further assessments will identify opportunities for changing forestry practice in relation to continuous cover, changing species, and INNS control.

6.46 Scotland's freshwater habitats are vital for socio-economic development, food security, and biodiversity, with direct impacts to people and businesses, as research suggests that the overexploitation of ecosystems without regeneration has led to massive deterioration with consequences to human health, livelihoods, and biodiversity (Bogardi et al., 2020). As such, research and policy development for best-practice science and management will have direct benefits, especially with regards to Scottish wild salmon and agriculture, through coordinated evidence-based scientific research and modelling to inform contemporary

management. The development of Fisheries Management plans will help maintain sustainability of fish stocks and respond to changes in the status of stocks for fishing industries. More sustainable management measures will lead to a more resilient fishing and aquaculture sector, better able to maintain production and profitability with the changing climate.

6.47 Actions to increase research to identify the market demand and opportunities, supporting climate adaptation, will likely increase opportunities and support for the research and education sector, as well as downstream economic opportunities and benefits. Further research on the implications of projected climate changes within the context of potential changes in trade and other drivers will also help inform planning. There may also be benefits from more integrated cross-sector action across agriculture, forestry, natural environment, and human health to implement good practices and share tools and resources.

6.48 Actions to support regional development through enterprise agencies will deliver benefits for businesses in adapting. The development of an approach to regional just transition plans is likely to include a focus on businesses most likely to be affected by climate change and the transition to net zero.

6.49 Incorporating climate resilience specifically in supply chain risks will provide benefits to all businesses by helping ensure that supply chains are more resilient to climate change and climate events. Similarly, considerations for climate resilience and vulnerabilities in international supply chains will have similar benefits.

6.50 The SNAP3 objectives to improve Scotland's domestic and international food security from climate-related shocks and the provision of funding to support the delivery of the strategy, with specific supply chain security considerations, will have benefits to food processing, wholesale, retail and catering / hospitality businesses.

6.51 Support from Transport Scotland to manage risks to business distribution networks from climate-related events will be beneficial to businesses dependent on the movement of goods and people because of greater resilience and adaptation to climate risks.

6.52 Actions to support greater resilience in public sector supply chains through the consideration of adaptation in supplier procurement contracts will encourage businesses supplying the public sector to adapt and become more resilient.

Outcome Five: International Action

6.53 The SNAP3 objectives to improve engagement and participation and the support for the development of the global evidence base on addressing non-economic and slow-onset loss and damage, will likely improve adaptation engagement and improve Scottish reputation globally with respect to climate related issues.

Costs

This section sets out the costs of SNAP3. The assessment of the costs considers two options including a business-as-usual option where SCCAP2 is not updated, therefore, considering the cost of inaction, and the cost of adaptation where the SCCAP2 is updated to the SNAP3 following the EEA's methodology for assessing the costs of climate change adaptation (EEA, 2023).

6.54 There are no aggregate estimates of the costs of adaptation for the UK, and thus no reliable estimates of adaptation finance needs (Watkiss, 2022). As such, the costs provided in this section are largely indicative. It is important to note that while the costs of adaptation may be predictable, the costs of not adapting are less predictable, spatially and over time, with increasing risks and consequence of the changing climate as well as the increased frequency of extreme weather events because of climate change.

6.55 It is important to note that while the costs of adaptation may be predictable, the costs of not adapting are less predictable, spatially and over time, with increasing risks and consequence of the changing climate as well as the increased frequency of extreme weather events because of climate change.

Option 1 – Business as Usual (costs of inaction)

6.56 This option represents the cost of inaction where the current Scottish Climate Change Adaptation Plan is not updated.

6.57 The impacts of climate change including extreme weather events and weather and climate variations is expected to increase as such under a 'business as usual' option. Evidence suggests that the potential for more extreme temperatures, weather and climate variations, and extreme weather events could exacerbate climate impacts to the Scottish public, economy and sectors. As such, it is estimated that the costs from climate change impacts are expected to increase under current climate projections as presented in a report by Watkiss, (2021) who present the variation in costs between a 2°C and 4°C scenario for the UK as seen in Figure 6.3.

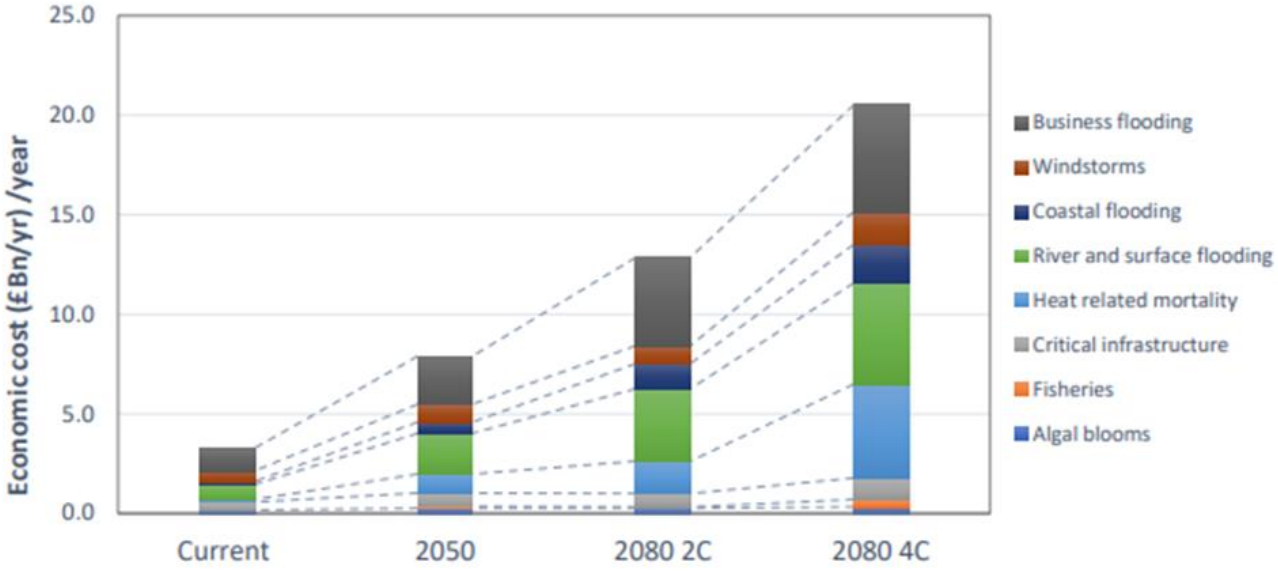

Figure 6.3: Estimated annual costs of climate change in the UK in £billion for a selection of climate risks (Watkiss, 2021).

6.58 It is expected that estimated costs will vary with regards to Scotland. However, the outlined sections below present an indication of the costs to the Scottish public, businesses, economy and environment.

Cost of inaction to Scotland's infrastructure and infrastructure services

6.59 Climate change impacts such as extreme temperatures, high winds and increased frequency of lightning strikes from more frequent storms impact many sectors of the Scottish economy and the Scottish public. This includes transportation and distribution networks where rail buckling, sagging overhead cables, signal failures, damage to equipment, thermal loading on bridges and pavements, loss of tree cover, transport disruptions, and delays in maintenance, have affected the sector (Sniffer, 2021). Between 2006 and 2016, UK-wide costs associated with these identified hazards amounted to over £20 million in compensation payments in relation to high temperatures, approximately £145 million in compensation payments for high winds related hazards, £40 million in compensation payments because of lightning strikes. Impacts to the built environment are of concern as the economic costs of indirect/cascading impacts have been estimated to be between 1.3 and 3 times the direct impacts of infrastructure failure and 5 to 6 times increase is estimated for a 2050 4°C scenario compared to the current baseline (Watkiss, 2021).

Cost of inaction for flood risk

6.60 The risk of flooding to people, communities, businesses and the built environment is one of the most severe risks from climate hazards identified in CCRA3. The CCRA3 states that the economic impacts individually for residential properties from all sources of flooding in Scotland are estimated to be just over £68.5 million per year and the 2018 National Flood Risk Assessment for Scotland estimated that 284,000 properties are at risk of flooding. When including non-residential properties and indirect as well as direct damages, this estimate rises to £200 – 250 million per year. For instance, the storms of early 2016 were estimated to have cost the Scottish economy £700million (Sniffer, 2021). However, the costs from flooding go past direct damages, to include consequential business disruptions, supply chain shocks, welfare effects such as health and wellbeing impacts, and the degradation of ecosystem services which can equal or exceed direct damages (O'Donnell et al., 2019). The costs associated with flooding extend to other aspects of the built environment. For example, it was reported that the Lancaster winter floods of 2015/16, had cascading impacts on communication services, transport and businesses, and the lightning strike-caused power outage in 2019 affected train operating companies, hospitals, water treatment plants and an airport. These impacts are also strongly linked to other sectors, interacting with other facets of the Scottish economy and people, including food, water, and health and community.

Cost of inaction to the rural economy

6.61 Climate-related impacts like damage and maintenance delays will increase threefold in Scotland. The potential for overheating in workers could increase eight-fold according to the CCRA3. It is also estimated that the annual cost of buckling and quadrupling of temporary speed restrictions, impacts to road services and network users from extreme temperatures, and clear-air turbulence during the cruise phase of flights is projected to increase because of climate change, increasing journey length and fuel consumption. The expected increase in risks under projected climate change may lead to reduced growth and reduced carbon sequestration, potentially affecting the competitiveness and profitability of food and other products for businesses and consumers. It may also increase capital costs, such as new machinery and technologies that reduce the environmental impact of farming/land management as sectors, households and businesses both at home and abroad may need specialised services and skilled trades to adapt to the changing climate.

6.62 The impact of extreme weather events like flooding has the potential to affect access to capital for businesses as the availability and affordability of insurance cover will be affected by rising risk levels. As such, credit may become more expensive for companies who are considered to be taking insufficient action to adapt to climate change or business at more risk to climate change impacts, such as business in high flood risk areas. A business's ability to adapt may also be limited by the availability of affordable loans to finance adaptation measures.

6.63 The changing climate is also likely to have direct impacts on business and employee productivity, as well as the health and wellbeing of the Scottish people because of heat stress. Workers engaged in particular sectors or occupations, such as builders, farmers and factory workers, who are involved in manual labour, may be at the greatest risk of heat stress. Extreme weather can also impact productivity because of travel and supply chain disruptions, which could lead to increased costs and reduced reliability for consumers. There could also be increases in maintenance costs for wear and tear of vehicles from melting asphalt and cracking pavements, and fuel consumption because of air turbulence.

6.64 Additionally, analysis suggests that the avoided decrease in residual damage costs because of coastal adaptation is likely to be significant, resulting in additional avoided costs for business premises (Sniffer, 2021).

6.65 There are also linkages between water resources and socio-economic development according to Báldi & Vári, (2020). For example, the location of business premises may impact on the availability of water with some water catchment areas in the UK projected to have supply-demand deficits. As such, water stress may become a problem for some businesses, especially water intense industries such as those producing chemical products, paper products and food and drink.

Cost of inaction for invasive species

6.66 Pests and invasive species will have negative impacts on Scotland's farming, fishing, and forestry sector and cascading effects for the food and drink industry and tourism industry. Affected species and habitats will involve native and non-native species respectively, and can lead to food shortages, can affect the affordability and the health and wellbeing of people living in Scotland. Indicative estimates of the economic damage from pests, invasive, and non-native species, suggests that this impact potentially costs £1.8 billion per year to the UK economy and £0.24 billion per year to the Scottish economy (Sniffer, 2021).

6.67 It should be noted that there could be potential benefits from new species populations because of invasive species which could reduce the cost to the Scottish economy and relevant sectors (Sniffer, 2021). This includes the rising populations of species and habitats that will thrive in rising temperatures the northward migration and expansion of species towards new areas. However, it is not yet possible to provide a valuation of this benefit. Other benefits that could offset some of the costs to the agricultural and forestry sectors arise from changing conditions that favour agricultural products such as improved suitability for wine growing and increases in tourism as other international regions are affected negatively from climate change (Watkiss, 2021).

Cost of inaction for the farming and fishing industry

6.68 The impact of flooding also extends to the agricultural sector where evidence shows that the area of best quality agricultural land at risk from fluvial flooding in Scotland is projected to increase by 26% by the 2050s and 31% by the 2080s under a +2°C at 2100 scenario (Sniffer, 2021).

6.69 Weather and climate variations also affect utilised land area, yields and productivity, and climate projections show that existing good quality land would become less suitable for arable uses because of drought risk and excess waterlogging which could be a greater current risk than water or heat stress for wheat yield in Scotland. Additionally, weather and climate variations, in combination with other factors, have negative impacts on soils. Future projections show that the risks to soil and Scottish agriculture and forestry businesses is likely to increase because of heavier rainfall events, resulting in erosion, compaction, and pollution, and increased soil moisture deficits in summer, leading to loss of soil biodiversity and organic matter. The estimated economic impact to Scotland, is estimated to range between £31m and 50m per year from soil erosion by water. This risk to Scotland's farming

industries could have potential international impacts such as risks to food availability and risks to the financial sector from price shocks, which could have very high economic costs (Watkiss, 2021).

6.70 Further impacts to both the natural and built environment in Scotland include reduced water availability and higher temperatures, which could affect freshwater habitats and Scotland's buildings and business. For instance, salmon migration in rivers has been found to be correlated with freshwater temperatures, which is of national and international importance in Scotland, accounting for significant portions of UK and European salmon production (Sniffer, 2021).

Option 2 – Implement the draft SNAP (the cost of implementation)

6.71 Under this option, it is anticipated that there will be additional costs because of the implementation of the outcomes of the SNAP3 but also benefits resulting from climate impacts avoided and climate opportunities realised. The costs associated with this option have been collated from available evidence and analysis from various sources to provide high-level estimates of potential costs.

6.72 A recent report from Watkiss, (2022) on the costs and benefits of climate change adaptation in the UK states that "Estimating the costs of adaptation at national and local level is extremely challenging." In this assessment, we have attempted to give a perspective on the costs and benefits of the proposals included in the draft SNAP. To achieve this, we have relied on secondary sources, along with professional judgement, to provide quantification of costs and benefits where possible. It is also worth highlighting that adaptation is likely to include high operating expense costs (recurring, associated with ongoing operations, maintenance, etc.). It is important to note that the cost and benefits are not likely to fall evenly across the business sector. Costs may be front loaded and benefits are likely to accrue over time, particularly as climate change becomes even more pronounced. There are also likely to be disparities in the geography of costs and benefits, with some of the benefits difficult to predict given the spatial variation in severe weather events. Furthermore, some geographic areas are more likely to be affected by different types of climate risk.

6.73 Furthermore, Watkiss, (2021) state that "There will be costs associated with addressing climate risks with business supply/supply chains, but these are not well characterised. There are some case studies on the costs of adaptation for addressing labour productivity impacts." Therefore, the costs of climate adaptation on businesses is a relatively unexplored topic.

6.74 There is limited evidence to undertake a valuation of SNAP3 against SCCAP2 and uncertainty surrounding the economic impact of previous adaptation plans as such the costs of adaption presented are largely indicative and qualitative in nature, informed by available literature.

6.75 The future actions of SNAP3 are wide reaching, and there is a strong economic case for greater Scottish Government intervention in research, policy development, monitoring, awareness, and coordination of reactive responses. While the costs of adaptation may largely be absorbed by land owners, consumers, and relevant sectors, It is anticipated that the economic benefits of adaptation are high compared to the costs (Watkiss, 2021). It is important to note that the implementation of funding and grants will help reduce the impact of costs while the provision of research and strategies will streamline information and management practices needed for climate change adaptation across sectors.

6.76 While it is difficult to anticipate the economic cost of SNAP3 for the Scottish public, businesses and third party sectors, exact costs will depend on a variety of factors, including the specific measures. However, an initial review of the costs of adaptation for the UK indicates adaptation costs / investment needs for the most important CCRA3 risks to be around £5 billion/year for this decade. However, expanding to all 61 risks the costs of adaptation could increase to £10 billion/year this decade (Watkiss, 2022). It is expected that these estimates are likely to increase as the severity of climate change impacts increase. The image in Figure 6.4 presents the indicative costs of adaptation for the major risks in the CCRA3 from this review.

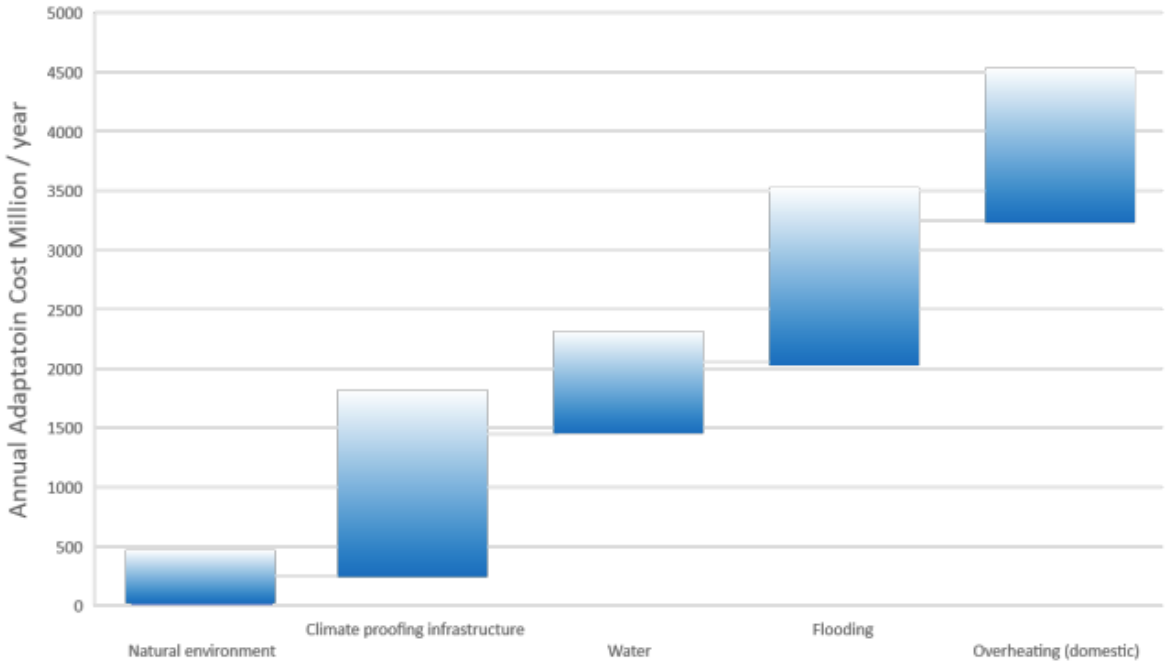

Figure 6.4: Watkiss's indicative costs of adaptation for the major risks in the CCRA3 for the UK (Watkiss, 2022)

6.77 It is also important to note that these costs can be offset by the benefits of adaptation, including actions implemented by SCCAP2 which have long-term effects such as reduced damage from climate events, improved health because of cleaner air, and economic stimulation through current and future investments.

Outcome One: Nature Connects

6.78 With regards to nature-based solutions, potential changes and restrictions on land use and land management practices could affect some businesses and potential restrictions on water abstractions and discharges could have a similar effect.

6.79 It is estimated that the costs to the natural environment for adaptation actions to cover the finance gap to deliver nature-based outcomes and targets to be between £44 billion and £97 billion over a decade. Further estimates suggest that considering further impacts of climate change, which could add to the risks assessed in the CCRA3, these costs could increase by 20% (Watkiss, 2022). These costs will be potentially high for the farming, agriculture and forestry sector and the Climate Change Committee states that Scotland's agricultural sector is particularly vulnerable to the impacts of climate change (Climate Change Committee, 2023). However, these costs have been described as low regret options, especially for dependent industries like the food and drink industry.

6.80 Actions to provide mapping support could potentially create restrictions on land use from new information which could impact related businesses.

6.81 It is anticipated that the resulting projects from increased investment into BGI and marine restoration and enhancement could potentially result in short-term restrictions on fisheries as well as restrictions on future marine energy development.

6.82 The Peatland Action Plan and the review of UK Forestry Standard has the potential to result in changes in land use, allowing peatland restoration and woodland creation and expansion.

Outcome Two: Communities

6.83 It is anticipated that increased and improved coordination between public, private, and third sector to support adaptation and resilience will require increased time inputs and costs.

6.84 SNAP3's resilience objectives could result in restrictions on land and/or land use.

6.85 There could be potential increases in design and construction costs for new buildings as a result of updates to building standards from understanding climate scenarios in

current British and European standards, and there are costs of retrofitting adaptation measures to existing business premises. Retrofitting is a crucial step towards achieving Scotland's net-zero carbon goals, however, expert insight suggests that retrofitting Scottish buildings is a long-term project, is time and resource intensive, and will result in pressures on human resource capacity and budgets for repair and renovation (EHA, 2021).

6.86 An analysis on typical uplifts associated with climate proofing showed that the annual adaptation cost of building climate resilience in the UK's National Infrastructure Delivery Plan NIDP economic project pipeline could be £0.2 billion to £4.8 billion/year, with a central estimate of around £1 billion/year.

6.87 It is anticipated that there will be added considerations for the development of new buildings and infrastructure in Scotland because of policy changes and as more sustainable strategies are developed which could result in initial cost loading. However, a significant portion of these costs will be offset by avoided cost from more climate resilient infrastructure and buildings.

6.88 As the climate changes, individuals, households, and businesses will need access to new products to help them adapt to the changing climate. This will include emerging markets for new products and services such as those required in construction for more resilient buildings, from potential new building standards from understanding climate scenarios in current British and European standards, and skilled workers required, and emerging markets for new products from changing consumer demand for existing products in response to climate change (Tao et al., 2022).

6.89 It is anticipated that there will be additional adaptation costs for the public sector, because of the scale up needed to address the risk of overheating. These costs will extend to both residential and non-residential buildings, and are likely to be high. For example, the costs of retrofitting the existing buildings. Indicative costs place adaption measures for new build between £1000 - £3,000 per house, or £0.2 – £0.9 billion/year for 200,000 to 300,00 new homes a year. While retrofit costs are anticipated to be much higher. The CCC provides an indicative estimate for climate proofing building stock at £4-5 billion overall by 2050 (Currie & Brown & AECOM, 2019).

6.90 The adaptation actions to make the historic environment more resilient will lead to economic costs of retrofitting adaptation measures to existing business premises and there is the potential for the costs of adaptation to impact some cultural sector businesses.

Outcome Three: Public services

6.91 Improved identification of flood risk communities and areas could lead to future restrictions on locations where development will be permitted and guidance and information on flood risk will lead to additional considerations and retrofitting costs for at risk business properties and communities.

Outcome Four: Business and Industry

6.92 It is not clear what the direct economic costs of adaptation will be for related Scottish businesses. However, it is anticipated that research and policy development into the various actions of the SNAP3 regarding the natural environment will lead to significant changes in operational and management practices and the promotion of information and adaptive measures will likely lead to behavioural changes in the Scottish consumers.

6.93 It is anticipated that adaptation, and the associated costs of adaptation, prompted by increasing awareness, will most likely be focused at risk areas like coastal regions and small businesses in Scotland. This is also applicable to areas of water stress regarding the risk of water shortages.

6.94 Additional advice, skills and funding, as well as new research for the farming and wider agricultural sector will potentially result in changes in the pattern of land management to anticipate climate change and avoid impacts.

6.95 Actions to improve the resilience of the forestry sector will result in additional spatially specific adaptation considerations and potentially result in changes in forestry practice and changing costs of management needed to respond to climate change.

6.96 Incorporating climate resilience specifically in national and international supply chain risks could lead to higher costs for businesses and consumers, however, it is anticipated that these costs will be outweighed by reduced risks to infrastructure and supply chain disruptions.

6.97 Funding and improved domestic and international food security from climate-related shocks could also introduce higher costs for businesses and consumers, though outweighed by reduced disruptions.

6.98 Actions to support greater resilience in public sector supply chains through the consideration of adaptation in supplier procurement contracts has the potential to lead to additional costs and considerations for tendering for public sector business.

Outcome Five: International Action

6.99 It is not anticipated that the SNAP3 objectives will lead to significant costs to Scottish people, businesses, and third party sectors.

Chapter 7
Tests

7.1 This section provides a summary of the tests undertaken to help understand the impact of the policy on a wide range of factors that could affect businesses in Scotland.

Regulatory and EU alignment test

7.2 This section considers if SNAP3 is likely to impact on the Scottish Government's policy to maintain alignment with the EU. Scotland's commitment to remain close to the EU means Scotland will continue to align with the EU where appropriate, and in a manner that contributes towards protecting and advancing standards across a range of policy areas. We have assessed three main areas to determine the regulatory and EU alignment test.

1. **The Scottish Government's commitment to maintain and advance the high standards that Scotland shares with the EU**: The European Commission adopted its new EU strategy on adaptation to climate change on 24 February 2021. The new strategy sets out how the European Union can adapt to the unavoidable impacts of climate change and become climate resilient by 2050. EU law and progress has generally lagged behind mitigation measures. Therefore, adaptation measures and laws in Europe are still in their relative infancy.

   The European Climate Law requires EU countries to adopt and implement national adaptation strategies and plans. These must be updated and communicated every two years in reports dedicated to national adaptation actions. Every five years, starting in 2023, the European Commission will then assess collective progress by member states.

   The measures in the draft SNAP3 should align Scotland with EU ambitions for member states to become climate resilient by 2050. The main deviation from EU standards is that SNAP3 covers a four years period rather than the two years that will be required for EU national adaptation strategies and plans.

2. **Access to EU markets for people, goods, and services**: The draft SNAP3 will not affect access to EU markets for people, goods or services.

3. **Any potential implications for EU alignment associated with the United Kingdom Internal Market Act 2020 or Common Framework agreements**: It is not anticipated that SNAP3 will affect EU alignment associated with the United Kingdom Internal Market Act 2020 or Common Framework Agreements.

7.3 In summary, SNAP3 is unlikely to have a significant impact on EU alignment in a positive or negative regard.

Scottish Firms Impact Test

7.4 This section considers the impact of SNAP3 on different sectors of the Scottish economy through an engagement process undertaken with businesses and sector representatives. This assessment considers the following areas to determine the impact on Scottish firms:

1. **The businesses and sectors most likely and less likely to be affected by the objectives of the SNAP3**: This includes consideration for business sizes, particularly small, medium, and large-scale businesses, and the distribution of impacts between these business sizes.
2. **The potential impact on Scottish businesses and sectors**: This includes consideration of overall costs, and related additional costs to businesses, as well as the potential benefits to businesses and sectors of the Scottish economy.
3. **The potential impact on the competitiveness of Scottish business and companies**: This area considers the impact on the competitiveness of Scottish businesses in Scotland, within the UK, and around the world.

7.5 Engagement with business and sector representatives is currently ongoing and the findings from this engagement which will support the conclusion of the Scottish Firm Impact test will be presented in the accompanying Appendix upon completion.

Competition Assessment

7.6 This section considers the potential impact the updates in the SNAP3 will have on competition between firms, including the impact of proposed policy developments and their potential to restrict firms. We assessed the following areas to determine the competition assessment test.

- The relevant markets, and services likely to be affected
- The potential for changes in competition due to changing incentives
- The potential impact to the number or scale or suppliers because of the ability or inability to compete
- The potential changes in competition because of changes in consumer choices and information

7.7 The revision of SNAP3 will not directly limit the number and range of suppliers across the Scottish economy. The economy will change because of the update to SNAP3, with some businesses and supply chain companies changing scope and scale of their operations, and diversifying, however these changes will occur in the long-term and because of individual sector level policies.

7.8 Additionally, SNAP3 will not limit the ability of suppliers to compete, nor will it reduce suppliers' incentives to compete vigorously, as per the reasons outlined above. While consumer purchase behaviour can affect business models and competition, it is not possible to predict changes in consumer behaviour from the SNAP3 because of presence of other factors responsible for impacting consumer choices such as economic factors.

Digital Impact Test

7.9 This section considers the unintended impact of advances in technology on the future delivery of the SNAP3. This section, therefore takes account of the considerations for changing technologies and markets within the SNAP3.

7.10 It is not anticipated that SNAP3 will have any unintended significant impact on advances in technology and therefore will not impact the future delivery of the key outcomes of the legislation. The key objectives of the SNAP3 include adaptation research, innovation, and knowledge exchange actions and any changes in technology are most likely to impact the land management industry in Scotland, where autonomous practices may reduce the environmental impact of certain land management processes, such as direct drilling. However, these technological changes are not anticipated to impact the future delivery of SNAP3.

Tests Scoped Out

7.11 Legal Aid Impact Test – the BRIA will not create a new procedure or right of appeal to a court or tribunal, any change in such a procedure or right of appeal, or any change of policy or practice which may lead people to consult a solicitor.

7.12 Test run of business forms – no new business forms will be introduced as part of the SNAP3.

Chapter 8
Enforcement, implementation & summary and recommendation

Enforcement, sanction and monitoring

8.1 In SNAP3, the Scottish Government has committed to the following monitoring measures:

- We will report on the objectives annually and longer-term outcomes at the start and end of the plan.
- Through SNAP3's new monitoring framework, we will provide significantly better data to maximise the value of these assessments.
- We will select indicators for SNAP objectives where the data is relevant, available and likely to show changes on an annual timescale.
- We will still publish a monitoring framework even if it does not adequately monitor all SNAP objectives and outcomes at the outset.

Implementation and delivery plan

8.2 The public consultation period on the draft SNAP3 will run until the end of March 2024. Post-consultation, publication of the final SNAP3 is scheduled for September 2024.

Summary and recommendation

8.3 The review of the SNAP3 indicates significant undertake in research, engagement, and consultation between government, local government, partners, businesses and individuals. This will require a defined scope to help ensure all research and engagement is focused.

Declaration and publication

8.4 I have read the partial Business and Regulatory Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options. I am satisfied that business impact has been assessed with the support of businesses in Scotland.

References

Báldi, A., & Vári, Á. (2020). Freshwater ecosystems: research, policy and applications. *Biologia Futura*, *71*. https://doi.org/10.1007/s42977-020-00051-3

Biasin, A., Masiero, M., Amato, G., & Pettenella, D. (2023). Nature-Based Solutions Modeling and Cost-Benefit Analysis to Face Climate Change Risks in an Urban Area: The Case of Turin (Italy). *Land*, *12*, 280. https://doi.org/10.3390/land12020280

Bogardi, J. J., Leentvaar, J., & Sebesvári, Z. (2020). Biologia Futura: integrating freshwater ecosystem health in water resources management. *Biologia Futura*, *71*(4), 337–358. https://doi.org/10.1007/s42977-020-00031-7

City of Edinburgh Council. (n.d.). *The value of City of Edinburgh Council's parks*. https://www.edinburgh.gov.uk/downloads/file/24775/the-value-of-the-council-s-parks

Climate Change Committee. (2023). *Adapting to climate change - Progress in Scotland*. https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-scotland/

Currie & Brown, & AECOM. (2019). *The costs and benefits of tighter standards for new buildings (Currie & Brown and AECOM)*. https://www.theccc.org.uk/publication/the-costs-and-benefits-of-tighter-standards-for-new-buildings-currie-brown-and-aecom/

Defra. (2020). *Multi-billion pound investment as government unveils new long-term plan to tackle flooding*. https://www.gov.uk/government/news/multi-billion-pound-investment-as-government-unveils-new-long-term-plan-to-tackle-flooding

Defra. (2021). *More than 1,000 flood schemes to benefit from record investment*. https://www.gov.uk/government/news/more-than-1000-flood-schemes-to-benefit-from-record-investment

Dong, K. K. (2020). How collaboration is driving the global climate agenda. *World Economic Forum.* https://www.weforum.org/agenda/2020/01/how-cross-sector-collaboration-is-driving-the-global-climate-agenda/

EEA. (2023). *Assessing the costs and benefits of climate change adaptation*. European Environment Agency. https://www.eea.europa.eu/publications/

EHA. (2021). Retrofitting Scotland's Homes: Evidence to the Local Government Housing and Planning Committee. *Existing Homes Alliance Scotland*. https://existinghomesalliancescotland.co.uk/wp-content/uploads/2022/01/EHA-Retrofitting-Homes-Briefing-LGHP-Nov21.pdf

O'Donnell, E., Thorne, C., Ahilan, S., Arthur, S., Birkinshaw, S., Butler, D., Dawson, D., Everett, G., Fenner, R., Glenis, V., Kapetas, L., Kilsby, C., Krivtsov, V., Lamond, J., Maskrey, S., O'Donnell, G., Potter, K., Vercruysse, K., Vilcan, T., & Wright, N. (2019). The blue-green path to urban flood resilience. *Blue-Green Systems*, *2*, 28–45. https://doi.org/10.2166/bgs.2019.199

ONS. (2019). *UK natural capital: Urban accounts* . Office of National Statistics. https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapital/urbanaccounts#extent-of-urban-space-in-the-uk

ONS. (2023). *Inter-Departmental Business Register (IDBR)* . Office for National Statistics. https://www.ons.gov.uk/aboutus/whatwedo/paidservices/interdepartmentalbusinessregisteridbr

RICS. (2020). Time to Retrofit: Decarbonising UK buildings and economic recovery. *RICS*. https://www.rics.org/news-insights/time-to-retrofit-decarbonising-uk-buildings-and-economic-recovery

Scottish Development International. (n.d.). *Scotland's infrastructure and connectivity overview*. Www.Sdi.Co.Uk. Retrieved January 25, 2024, from https://www.sdi.co.uk/business-in-scotland/infrastructure-and-connectivity

Scottish Government. (2009). *Climate Change (Scotland) Act 2009*. https://www.legislation.gov.uk/asp/2009/12/contents

Scottish Government. (2022). *Business and Regulatory Impact Assessment: Toolkit*. The Scottish Government. https://www.gov.scot/publications/business-regulatory-impact-assessment-toolkit/pages/1/

Scottish Government. (2023a). *BICS weighted Scotland estimates: data to wave 88*. https://www.gov.scot/publications/bics-weighted-scotland-estimates-data-to-wave-88/pages/climate-change/

Scottish Government. (2023b). *Businesses in Scotland: 2023*. The Scottish Government. https://www.gov.scot/publications/businesses-in-scotland-2023/documents/

Severn Trent. (2021). *Building sustainable, flood-resilient communities Business case 03*. Severn Trent. https://www.severntrent.com/content/dam/stw/regulatory-library/09_Business%20case%2003_Building%20sustai

nable%20flood%20resilient%20communities_FINAL_R.pdf

SFE. (n.d.). *Financial Services In Scotland*. Scottish Financial Enterprise (SFE). https://www.sfe.org.uk/financial-services-in-scotland

Sniffer. (2021). *Evidence for the third UK Climate Change Risk Assessment (CCRA3): Summary for Scotland*. Climate Change Committee. https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA-Evidence-Report-Scotland-Summary-Final-1.pdf

Tao, H., Sun, X., Liu, X., Tian, J., & Zhang, D. (2022). The Impact of Consumer Purchase Behavior Changes on the Business Model Design of Consumer Services Companies Over the Course of COVID-19. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.818845

The Food & Drink Federation. (2023). Scottish facts and stats. *The Food & Drink Federation*. https://www.fdf.org.uk/fdf/business-insights-and-economics/facts-and-stats-scotland/#:~:text=We%20employ%2048%2C000%20people%2C%2027%25%20of%20the%20Scottish

Transport Scotland. (2019). *Transporting Scotland's Trade 2019 Edition* . Transport Scotland . https://www.transport.gov.scot/media/45972/transporting-scotlands-trade-2019-edition.pdf

UKGBC. (2021). *Retrofit funding propositions*. UK Green Building Council'. https://ukgbc.org/wp-content/uploads/2021/02/UKGBC-GFI-Roundtable.pdf

Watkiss, P. (2021). *Monetary Valuation of Risks and Opportunities in CCRA3 FINAL REPORT*. https://www.ukclimaterisk.org/wp-content/uploads/2021/06/Monetary-Valuation-of-Risks-and-Opportunities-in-CCRA3.pdf

Watkiss, P. (2022). *The Costs of Adaptation, and the Economic Costs and Benefits of Adaptation in the UK (Paul Watkiss)*. https://www.theccc.org.uk/publication/the-costs-of-adaptation-and-the-economic-costs-and-benefits-of-adaptation-in-the-uk-paul-watkiss/

Appendix A

Summary of Consultation Questions

Click to enter introduction.

A.1 This section presents a summary of the consultation questions for the government, business and public consultation.

Government consultation questions

1. Please name your directorate
2. Please indicate your policy area
3. Please indicate which section/sections of the draft SNAP3 you were involved in formulating
4. Based on your areas' contribution to the draft SNAP3, what do you think the main benefits of this policy will be for businesses in Scotland?
5. Please reference or link any pre-existing data sources you have on benefits directly relevant to your SNAP3 policy area.
6. Based on your area's contribution to the draft SNAP3, what do you think the main costs of this policy will be for businesses in Scotland?
7. Please reference or link any pre-existing data sources you have on costs directly relevant to your SNAP3 policy area.
8. Which business industries do you think will be most affected by the policies in your SNAP3 area?
9. What, if any, differences in the impacts of your SNAP3 area do you expect to see in businesses of different sizes?
10. Do you have any other comments?

Business and public consultation questions

1. What sector does your organisation operate within/represent?
2. Please confirm who you are responding on behalf of:
3. How many people are currently employed by your organisation?
4. How many members does your organisation represent?

5. Have you considered how climate change will impact your business in the near and long-term future?

6. What, if any, measures and or practices have you introduced to your industry/organisation to support climate adaptation?

7. Nature is a central element of our efforts to address the risks posed by climate change - it presents one of the best tools we have to adapt to the changing climate. From installing blue-green infrastructure around business premises, as both a flood prevention and cooling measure, to integrating trees on farms as shelterbelts, nature-based solutions to climate change are often more cost-effective and longer lasting compared to technology-based solutions.

   What ways, if any, are you considering or currently implementing the use of nature and biodiverse ecosystems in adapting your organisation/industry to the impacts of climate change?

8. Building the strength of our local communities can help us navigate the difficulties of climate change and the need to adapt. Our response to climate change needs solutions which address community concerns and priorities, which are fair, just and make the most of local opportunities and resources.

   What ways, if any, are you considering or currently implementing in your industry/organisation to design local adaptation solutions?

9. Our economy relies on Scotland's essential services and critical infrastructure to support its day-to-day and long-term operations. While many aspects of our infrastructure network are reserved, an impact in one network can cascade and affect others. The following infrastructure components have been identified as at risk from the impacts of climate change.

   - Transport system including road, rail, maritime and aviation networks
   - Power assets and the energy system
   - Water, sewerage, and drainage

   In what ways, if any, do you anticipate disruption to the following infrastructure components could impact your industry/organisation in the future?

10. The susceptibility of supply chains to the effects of climate change is expected to rise, and climate change is also predicted to escalate disruptions in both international and domestic supply chains.

    In which ways, if any, do you anticipate disruptions to the supply chains in your industry/organisation could impact upon your industry/organisation in the future?

11. To remain profitable, businesses must be able to assess climate risks and to adapt in response. The Scottish Government will provide businesses with support and advice to enable them to respond to climate risks. The Scottish Government currently supports businesses through the Adaptation Scotland Programme, which delivers free, practical guidance and advice to help businesses prepare for, and build resilience to climate-related hazards.

    What, if any, impact do you feel having access to adaptation specific business support will have on your industry/organisation?

12. Changes in Scotland's climate could impact many businesses access to funding and the affordability or availability of insurance, particularly for those in areas exposed to flooding and/or coastal change. Ensuring financial flows that are considerate of climate risks and opportunities will be a key part of ensuring long-term financial stability in Scotland.

    In which ways, if any, do you anticipate the impacts of climate change on securing finance and or insurance in your industry/organisation?

13. Addressing climate challenges also brings opportunities for businesses, sectors, and regions to innovate, and explore products and services that can help Scotland adapt and support the transition to a climate-resilient, net-zero economy. Examples include opportunities for agricultural and forestry productivity as new/alternatives species become suitable due to changing climatic conditions, and opportunities for innovative retrofitting solutions in response to the need to adapt current and future housing stock to the increase in temperatures.

    What, if any, opportunities can you foresee arising in your industry/organisation as a result of climate change?

14. Do you think increasing Scotland’s climate adaptation ambitions will have an impact on the competitiveness of Scottish companies/your company/your industry within the UK, or elsewhere in Europe or the rest of the world?

15. What do you think are the largest benefits to businesses/your business/your industry in increasing climate change adaptation measures

16. What do you think are the largest costs to businesses/your business/your industry in increasing climate change adaptation measures?

17. Where (geographically, industry, company size etc.) do you foresee the costs and benefits of climate change adaptation to be felt in Scotland? Do you think these will be shared evenly?

18. Is there anything else you would like to add?